MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

E-learning in the workplace

An annotated bibliography

New Zealand Government

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1 KEY FINDINGS

- E-learning can provide flexible learning options for employees and allow them to up-skill more rapidly. E-learning in the workplace can decrease the costs of up-skilling a workforce through reducing travel and employee time away from work. E-learning is particularly useful for a geographically dispersed workforce because it can deliver a consistent training experience.
- The uptake of e-learning in the workplace is increasing. Many New Zealand firms have the systems and infrastructure to support e-learning, but often lack the capability to implement it successfully. To overcome design inadequacies in e-learning courses, new skills and personnel are required in the teams charged with developing and delivering it.
- Firms need to have strategies and plans in place to support their e-learning which integrate or align with their overall plans and strategies. Support by managers for e-learning in the workplace (including allocating sufficient time for it) is critical to success.
- Large organisations are more likely to adopt e-learning than small and medium-sized enterprises (SMEs) because they have better infrastructure and systems and can more readily achieve economies of scale and return on investment. SMEs can form collaborative networks to share knowledge, resources, and expertise to overcome the cost and relevance barriers they face when implementing e-learning.
- E-learning is most often used in workplaces to supplement traditional delivery (blended learning). Blended learning can contribute to significant gains in learner achievement.
- The focus in workplace e-learning has moved from 'courses' to learning content that is available to employees as and when needed. E-learning is more effective when people can access it in small 'chunks', reflect on it, and then apply it immediately.
- E-learning supports informal learning in the workplace because it makes it easier to codify information and knowledge and make this available to the organisation and its external stakeholders.
- The most common technologies and systems used to support workplace e-learning are Learning Management Systems, video, mobile devices, social networking tools, wikis, weblogs, simulations/virtual reality, CD-ROMs, and DVDs.

Some of the main barriers to implementing e-learning in the workplace are:

- High up-front costs that include new and/or upgraded systems, training the trainers, and developing interactive and/or personalised content.
- Employee resistance to e-learning.
- Organisations not having an appropriate learning culture in place.
- Lack of management support
- Adopting technologies and systems that are difficult to use and access, are unreliable, and/or lack technical support.
- Employees and trainers lacking the skills and capabilities to teach and learn in e-learning environments.
- Irrelevance to real-time work tasks and not integrated with business processes.

2 EXECUTIVE SUMMARY

New Zealand and Australian workplace e-learning

Many New Zealand firms have the infrastructure and systems to support e-learning, but they often lack the capability to implement it successfully. In Australia, e-learning is more likely to be adopted by service sector than trades and retail organisations. Learning using mobile devices (m-learning) is used by Australian companies to support customers and field staff through remote access to management and operational systems.

Why and how are organisations adopting e-leaning?

The uptake of e-learning in the workplace is increasing, especially in the United States. Where e-learning is implemented, it is most often as part of a blended approach where it supplements traditional delivery. Blended learning can contribute to significant gains in learner achievement. E-learning is most commonly used by firms to meet their compliance requirements, for business inductions, and information and communication technology (ICT) training.

E-learning can reduce some of the costs associated with traditional delivery especially travel and employee absence from the workplace. Cost savings can also be realised by using subject matter experts and existing tools and technologies to develop content internally, rather than sourcing it externally. This content development approach also allows employees to be more closely involved and can produce more relevant materials. E-learning can also be particularly useful when there is a geographically dispersed workforce because it can deliver a consistent learning experience.

From an employee perspective, e-learning can provide flexible learning options and also allow them to more rapidly up-skill. Simulations and virtual reality environments are being used to provide more relevant, authentic workplace learning. E-learning can offer more customised training. E-learning also allows employees to revisit challenging aspects of the course more readily. Some firms are starting to introduce systems, technologies, and processes that embed training and learning within employees' daily work flows.

Informal learning is important in the workplace. E-learning can support this in two critical ways. Firstly, it can codify tacit or informal information and knowledge and make this available to the organisation and its external stakeholders. This also improves organisational knowledge management. Secondly, e-learning makes it easier for employees to form networks with others in the organisation and/or externally to share information and knowledge to assist with their daily work or up-skilling.

M-learning (e-learning accessed through mobile devices) allows employees to utilise ICT to enhance and extend workplace learning. Firms may need to adopt e-learning because younger employees expect the functionality and interactivity in their personal ICT to be available in corporate learning environments. Companies can also consider incorporating video and gaming technologies into workplace learning to more effectively engage younger employees.

Barriers to workplace e-learning

Workplace e-learning has high up-front costs including purchasing and/or upgrading systems and technologies, up-skilling trainers and employees so they can successfully teach and learn in e-leaning environments, developing interactive and/or personalised content and, where introduced, creating gaming and simulation/virtual reality environments.

Employees often resist the introduction of e-learning. Many employees prefer traditional delivery because e-learning can lack interaction with peers, trainers, and experts which is a major contributor to its low uptake and completion. If learners have negative attitudes towards e-learning (including a lack of belief in its usefulness and their own skills and capabilities to effectively use ICT), they are much less likely to participate in e-learning. There are also questions about e-learning's suitability for low-skilled workers and for employees who are not self-directed, independent learners.

E-learning content is often irrelevant to real-time work tasks and is generally not effectively integrated with business processes. One of the main problems for workplace e-learning is the tension between generic and interactive and/or personalised content. Generic content can easily be reused and allows cost savings to be realised. But while content that is interactive and personalised may lead to better learner experiences and learning outcomes, such content may not be as easy to reuse and costs more to develop. And if content is too interactive, it can overwhelm and confuse learners, leading to poor results.

Even interactive, personalised content will not lead to good outcomes if it is positioned in e-learning courses that are insufficiently challenging. Poorly designed e-learning courses often do not have the appropriate amount of information and are difficult to navigate. And they do not take account of appropriate teaching and learning theories.

It is also unclear how competence can be achieved in e-learning courses which have as their primary assessment mechanism quizzes or multi-choice tests. And e-learning courses that merely replicate traditional delivery online raise questions about its added value. Finally, poorly designed e-learning courses often provide insufficient feedback to learners. Poor design often leads to difficulties in assessing the contribution to employee skills and competence acquisition.

Often, trainers, and the course development teams lack the literacies, skills, and capabilities necessary to develop high quality e-learning courses and to teach in e-learning environments. This is compounded by many organisations not providing sufficient introduction or orientation to the new e-learning environment, so employees are unclear not only about the rationale for why they should use it, but also may not be aware of how and where to access it.

Businesses sometimes introduce e-learning when they do not have an appropriate learning culture in place to support it. For example, managers may not provide sufficient time for employees to undertake e-learning during the work day. Restrictive company policies about who can access computers and/or when they are available also hinders workplace e-learning.

The additional flexibility provided by e-learning coupled with unsupportive work environments can mean that workplace e-learning needs to be completed outside work hours which may not be suitable for all employees, especially those with family or care-giving responsibilities. Firms can adopt technologies and systems that are difficult to use and access, are unreliable, and/or lack technical support.

Tips for successful implementation of e-learning in the workplace

E-learning solutions need to be tailored to an organisation's culture, priorities, systems, and structures. Each organisation needs to scope not only its technological and pedagogical requirements, but also the economic, social, organisational, and informal dimensions of its workplace e-learning implementation contexts.

Management support is essential. This includes ensuring that the work (and, where necessary, home) environment supports e-learning and setting clear expectations for what will be completed and by when (which is particularly important for home-based e-learners). Managers should also provide various incentives for their employees to participate in e-learning courses including gaming type badges, public recognition of worker efforts, linking e-learning to career advancement, and providing monetary rewards. Finally, they need to ensure that the necessary resources (financial, human etc) are provided so e-learning can be successfully introduced and maintained.

Managers and employees are both more likely to support e-learning when they are aware of its benefits. This forms part of a wider 'marketing' exercise where firms provide a clear rationale for why e-learning is being adopted and provide appropriate orientation so that it can be accessed and used effectively.

Firms need to provide a good learning experience while achieving a return on investment through reducing costs and ensuring that employees are able to make use of the skills acquired

in e-learning environments. It is also important that e-learning supports or improves genuine business objectives and outcomes. Firms need to have in place appropriate plans and strategies to support their e-learning efforts that integrate or align with their overall strategies and plans.

Return on investment can only be established when firms undertake effective monitoring and evaluation. The most common framework adopted for this is the Kirkpatrick evaluation model and its variants. However, these have been criticised as not being fit for purpose and only measuring certain aspects of e-learning, such as the levels of learner satisfaction. While employee satisfaction is important, it is necessary for firms to clearly establish the contribution of e-learning to not only skills acquisition and application but also to changes in employee behaviours and attitudes.

The timing of evaluations is critical. The evaluation should gather information before e-learning is introduced, while it is being undertaken and sometime after it has been conducted (e.g. six months). Some firms are adopting benchmarking to evaluate their e-learning efforts.

E-learning content can be more consistent and of higher quality if its development is positioned within a continuous improvement framework which has discrete, but interrelated stages. Employees and course designers should co-construct workplace e-learning courses and their associated resources and materials to ensure that their relevance.

E-learning courses need to be well designed which is more likely where the relevant teams not only have the requisite skills and capabilities, but also the necessary personnel including managers, trainers, ICT and subject matter experts, and graphics designers. The skills and capabilities that employees and trainers need to teach and learn in e-learning environments include learning how to learn in these environments and trainers having facilitation skills and being able to identify when to train and when to facilitate. It is also important to remember that even expert computer and internet users may require additional support to learn effectively in e-learning environments.

Access to well functioning equipment and software and providing appropriate technical support is critical to the success of workplace e-learning. Firms should move from ‘courses’ to learning content that is available to employees as and when needed. Learning is more effective when people can access it in small ‘chunks’, reflect on it, and then apply it immediately.

It is important to balance the differing requirements and expectations of employees who are novices in subject matter or e-learning with those of expert employees. For example, novice employees requiring basic information need much less interactivity than expert employees learning problem-solving skills. And while expert e-learners may expect and value a technology rich environment, novice e-learners are likely to find this disorienting and unhelpful.

E-learning can be used by companies to form collaborative networks with training providers, industry bodies, and other firms and/or their employees for sharing knowledge and resources. Collaborative employee networks are an effective mechanism for experts to share knowledge with less experienced employees and to support workplace mentoring schemes. Collaborative networks are particularly useful for SMEs because it helps them overcome the barriers of costs and lack of relevant content.

Technologies and systems used in workplace e-learning

The most common technologies and systems used to support workplace e-learning are:

- *Learning Management Systems* allow employers to effectively monitor and evaluate e-learning uptake, processes, and outcomes. This is important in order to determine return on investment.
- *Simulations* are an effective way to allow practice and refinement of skills that cannot be practised in live scenarios, and where there are dire consequences for any mistakes. They can also support more authentic and relevant learning.

- *M-learning* needs input from designers, employers and learners to ensure it is realistic and fits workplace activities and safety requirements. M-learning provides more flexibility and customisation because employees can access just-in-time and just-enough information, knowledge, and learning where and when they need it.
- *Social networking tools* (e.g. Facebook and Twitter), and Web 2.0 technologies such as weblogs and wikis: these tools and technologies are becoming integral to workplace collaborative learning, the sharing and collection of informal knowledge and information, and the development of virtual communities of practice which are important for knowledge creation and dissemination.
- *Video technologies*: these allow employees to revisit more challenging tasks and are useful for employers because they can capture complex processes and ensure that these are consistently applied.
- *Older technologies* such as CD-ROMs and DVDs: these are the technologies of choice for many New Zealand Industry Training Organisations.

Organisation size

Large organisations are more likely to implement e-learning than SMEs because they have greater resources and more mature systems and processes to support it. They can also more easily achieve economies of scale and return on investment than SMEs. However, where large organisations have made substantial investments in their traditional delivery infrastructure, they may be reluctant to introduce e-learning at scale.

3 INTRODUCTION

Background

This report presents an annotated bibliography of 162 papers relating to the use of e-learning in the workplace.

We present this information in an annotated bibliography because it provides a means of making the literature more accessible. It is intended to be a collation of materials that provides a guide on what literature is available and report on what it says, but does not seek to synthesise or evaluate the literature.

Purpose

The objectives of this annotated bibliography are:

- to provide an overview of the literature on the use of e-learning in the workplace
- to assist businesses who have implemented or are considering implementing e-learning
- to assist trainers, government agencies, and institutions in their planning and implementation of e-learning
- to extract important findings.

Categories

This bibliography has been grouped into three categories:

- Introduction to e-learning – literature that is introductory and most likely to be relevant to those considering implementing e-learning in the workplace.
- Further development of e-learning – literature that may assist those who have implemented e-learning but wish to develop it further.
- Experience with e-learning – literature with more complexity about e-learning programmes and future developments.

Planned Series

This annotated bibliography is the fourth in a planned series. It follows the other annotated bibliographies which were titled:

- Learners' Participation, Retention and Success in e-learning
- Organisational approaches to e-learning in the tertiary sector
- Government and sector-level tertiary e-learning initiatives.

These three annotated bibliographies are published on the Ministry of Education's Education Counts website: www.educationcounts.govt.nz.

Other studies being considered for this series are:

- The systems and services used to support tertiary e-learning
- The learning spaces in which e-learning occurs.

4 METHODOLOGY

The literature in this annotated bibliography was derived from internet desk-top searches using the search terms: workplace e-learning, e-learning, professional development, vocational training, occupational training, web-based instruction, career development, workplace learning, organisational learning, online learning, mobile learning, and training programmes.

These desktop internet searches included Google Scholar, the website of Ako Aotearoa (the National Centre of Tertiary Teaching Excellence), and databases such as that of the National Centre for Vocational Education Research and the Australian Council for Educational Research's Blended Online Learning and Distance Education database.

Literature was also provided by the Ministry of Education's Library and from members of the Tertiary e-Learning Reference Group[1]. We selected published research from journals, books and the internet and we also sourced 'grey' literature, including unpublished theses and dissertations, and reports commissioned by government agencies.

Literature was selected for this bibliography if it:

- related to workplace e-learning
- was dated between 2005 and 2014[2]
- included training or education delivered by e-learning that occurred in New Zealand, Australian, Canadian, the United Kingdom, (UK), and the United States (US) workplaces
- fitted into, or aligned with, the categories listed in section 3 above
- would help meet the bibliography's objectives.

Literature that related to workplace e-learning delivered by tertiary education sector organisations in institutional settings was excluded because we wanted to only examine employer- and employee-led e-learning initiatives and developments occurring in the workplace. This means that work-integrated learning, practicum, and internships were also excluded.

This annotated bibliography uses the Ministry's definition of *e-learning*[3]: 'learning that is enabled or supported with the use of information and communication technologies (ICT) including the internet and mobile devices'.

The full literature list is referenced alphabetically and numerically in the bibliography in Chapter 8 below. Each annotation cross-references to this bibliography.

[1] The TeLRG was set up as an expert group by the Ministry of Education and Ako Aotearoa to advise them on tertiary e-learning.
[2] During the original search a number of papers that were published in 2004 or related to workplace e-learning at that date or older were uncovered. These are listed in a separate appendix at the end of this report.
[3] Ministry of Education website at http://www.minedu.govt.nz/NZEducation/EducationPolicies/TertiaryEducation/ELearning/WhatIsELearning.aspx

5 INTRODUCTION TO E-LEARNING

Online versus classroom training: Is there a clear winner?

Author: Anderson, A.

Reference number: 3

Year of publication: 2011

Introduction
For workplaces there are some major benefits to online training, particularly the costs savings associated with traditional delivery including travel, accommodation, course facilitators, and covering for absent staff.

Training can also be ongoing through e-learning rather than being restricted to a particular time period as is the case with traditional delivery. And training can be more easily standardised in e-learning than traditional delivery where individual experiences are more likely.

Key findings
E-learning is more effective for organisations with geographically dispersed workforces because it ensures that new employees receive training in a timely manner rather than waiting for sufficient numbers to be available before it can commence.

Traditional delivery offers immediate feedback and is more beneficial for unmotivated learners and for teaching skills where it is important to see whether or not the concept or associated skill has been understood and a basic competence or understanding achieved. Because there is no clear winner, organisations are increasingly adopting a blended approach which combines traditional delivery and e-learning. The key is in getting the balance between them right.

Searching, lurking and the zone of proximal development: E-learning in small and medium enterprises in Europe

Author: Attwell, G. and Harris, A.

Reference number: 4

Year of publication: 2007

Key findings

The main finding was that no respondents used e-learning to support their formal training and development. However, it is supporting informal learning such as using the web to locate 'just-in-time' knowledge and information. Some staff were members of virtual communities that supported knowledge creation for themselves as well as the wider community. Other small and medium-sized enterprises (SMEs) use expert staff, online materials, or existing web-based platforms to support their e-learning efforts.

E-learning is more widely used and accepted in SMEs that have highly standardised training requirements and where there were flatter management structures as well as employees having more autonomy in their decision making. However, many still restrict information and communication technologies to managers or administrators and/or day-to-day work tasks..

Managers are critical to the uptake of e-learning. However, many believe that traditional delivery is better suited to the needs of the business than e-learning. Managers who were more focused on innovation and development were more likely to adopt e-learning. Managers also need to ensure that the work environment including the infrastructure and actual work schedule support e-learning.

Most employers see cost as a barrier to the adoption of e-learning, despite the availability of public or sector organisation funding. Most employees do not have a positive view of e-learning, potentially because of isolation and lack of interaction. Those with more positive views tend to be self-directed learners who appreciate the self-paced and flexible approaches e-learning allows.

Employees need basic knowledge about the systems and technologies used to support their firm's e-learning efforts. The e-learning materials also need to be relevant, interactive and tailored to the skill levels of the learners. The main barrier identified to e-learning adoption was the lack of time. For employees this impacts on their home/work balance. In contrast employers want stronger evidence that e-learning is directly supporting work-related activities and company productivity to justify their investment. Vendors are also often selling generic e-learning packages whereas SMEs would prefer customised solutions.

Most SMEs did not have formal measures in place to assess the quality and effectiveness of their e-learning and instead appeared to be relying on anecdotal sources to verify this. There is also no consensus among SMEs and governments as to what would constitute quality e-learning in a SME context. Without accredited qualifications and assessments, judgements about e-learning tend to be intuitive and based on what works.

E-learning approaches by SMEs include computer-based training, informal and formal web-based training, distance learning, blended learning which combines traditional delivery and e-learning, and e-collaboration where technology-supported meetings and the like are used to build and share knowledge, and online communities which are typically used to support informal learning efforts as noted above.

Mobile devices and video-conferencing are rarely used to support e-learning and SMEs often voice concerns that the available technologies do not match their e-learning requirements. E-learning is not a ready-to-use technology, but rather a learning concept that requires a general organisational framework as well as establishment within these firms.

Choose your own learning: Learning through computer-based decision-making in children's services

Author: Ballam, A.

Reference number: 6

Year of publication: 2013

Introduction

This study was based on a trial of using e-learning at the YMCA Perth and was funded indirectly by the Australian Federal government as part of the Flexible Learning Framework programme.

The training presented various workplace scenarios. The answers given and decisions made presented the trainees with various options and alternatives until the desired outcome was achieved (this is referred to as an 'exploratory' system).

Key findings

The respondents had a high degree of comfort with the scenarios and decision making approach. They compared this approach favourably with others they had encountered, with the relevance of the scenarios being the most valued aspect alongside how easy the tools were to access and use.

The scenarios, for some, were lacking in depth but this was largely attributed to higher expectations from past participation and the nature of the qualifications being undertaken.

E-learning: Ageing workforce versus technology-savvy generation

Authors: Becker, K., Fleming, J., and Keijsers, W.

Reference number: 9

Year of publication: 2012

Introduction
E-learning is seen as more challenging for industries with older workforces. This is because of the perception that older employees are difficult to engage in e-learning given their more limited technology experience.

The Australian rail industry could be considered less conducive than others for e-learning because it is not viewed as being particularly 'high tech'. E-learning has been touted as a potential solution to address the imbalance in its workforce which is much older than others and has been marked by an inability to attract larger numbers of younger employees.

Methodology
Key members from five organisations were interviewed. These interviews were supported by organisational documentation as well as demonstrations of the e-learning products. All organisations were using e-learning to some extent, with a mix of internal and outsourced programmes.

Key Findings
Larger organisations tended to have more mature e-learning systems and approaches because they had greater resources and an increased ability to achieve economies of scale, while smaller organisations found it more difficult to justify the increased up-front expenditure.

E-learning helped address the challenges and expenses associated with training a geographically dispersed workforce by minimising employees' time off work.

All the organisations adopted a blended learning approach so that they could retain a traditional delivery component that was valued by many employees, with the blend differing depending on the content and target audience.

The use of wider or more advanced systems was related to a need to automate some of the administrative components associated with the training.

Overall it was apparent that e-learning was being used predominantly for compliance training and minimising disruption to work as well as its potential cost savings. Its potential for learner engagement, interactions between employees and trainers, and other more advanced uses is not yet being fully realised.

The key factors to consider when implementing e-learning were:

- age of employees and learning style preferences
- whether or not employees had access to computers as part of their work
- how much non-work web-based experience employees have and how that could be used to support e-learning opportunities at work
- e-learning is implemented for genuine business outcomes and return on investment, not just because it can be implemented.

A learner perspective on barriers to e-learning

Authors: Becker, K., Newton, C., and Sawang, S.

Reference number: 10

Year of publication: 2013

Introduction

The effectiveness of e-learning depends on the individual or organisational contexts, and may be no more successful than traditional delivery in developing higher order thinking or increasing learner engagement. The success of e-learning also depends on the social support provided with the increased use of technology to prevent potential isolation for the learner.

In the wider literature successful information systems implementation is generally attributed to six factors: system and information quality, use, user satisfaction, and individual and organisational impact.

Methodology

The reviewers undertook a literature review and also used the findings of a pilot survey and self-administered questionnaire. The case study organisation was involved in the Australian rail industry.

Key findings

The greatest barriers to e-learning were general concerns about its validity and effectiveness, the lack of interaction compared to traditional learning, and its inability to accommodate some learning styles.

The difficulty of using e-learning systems was also an important barrier with older, longer serving employees significantly less likely to adopt e-learning compared to other employees. Employees' lack of technology skills are a problem, as are their concerns about the use of computers for learning

Time constraints, especially the challenge of accommodating e-learning within daily work schedules, were also identified as a barrier to successful adoption.

Because the barriers to adopting information systems are similar, organisations can use the same lessons to inform their e-learning efforts.

The likelihood of success in adopting e-learning will be increased if organisations reassure users about its benefits and in particular address concerns about its validity and usefulness.

E-learning for the mature age worker

Authors: Bowman, K., and Kearns, P.

Reference number: 16

Year of publication: 2007

Introduction
Various studies show that that the majority of older workers have limited ICT skills, but that e-learning can help increase older workers' confidence. These studies also show that online communities can be used for older workers who are not familiar with computers, and that older learners prefer informal, self-paced, small group learning.

Key findings
While older workers were independent learners they highly valued peer and instructor support.

Older workers participate in e-learning to develop skills, to increase income and personal development, to support their lifelong learning, and increase the quality of their learning experiences.

However critical barriers need to be removed including attitudes of employers and younger workers, their own negative attitudes towards e-learning, a lack of ICT and literacy skills, and poorly designed e-learning materials and programmes. It is very important that their first e-learning experience is a quality one.

Older workers preferred blended learning approaches, meaning appropriate combinations of delivery methods technologies as well as a range of learning pathways and approaches.

The rationale and benefits need to be made clear. A well considered induction and orientation process is necessary and this should be supported by giving older learners sufficient time to become familiar with the supporting technologies.

It is also critical to recognise that older learners can and do participate in e-learning, rather than assuming that a lack of familiarity with technology means that they would rather use other methods to undertake their workplace training and learning.

E-learning should be linked to older learners' workplaces through appropriate strategies. It was noted that employer support for older workers undertaking e-learning was variable. Embedding innovative e-learning is a lengthy process that requires organisation-wide vision, will, determination, and drive.

Case study of Queensland Ambulance Service
The Queensland Ambulance Service (QAS) has many older workers and volunteers. They have adopted an e-learning approach to train them including the use of an Education Portal which makes a broad range of education material available anytime and anywhere to support flexible access and self-directed learning. The preferences of these workers were for the tools to be at the 'low tech' end of the technology spectrum.

Some of these recommended 'low tech' technologies such as CD-ROMs, Power Points, and video conferencing can support flexible and self-paced learning.

Briefing an elearning developer

Author: Brassington, C. O.

Reference number: 17

Year of publication: 2012

Introduction
Organisations often embark on e-learning initiatives without clear objectives or outcomes.

Key findings
Once the purpose of e-learning is established it needs to be strictly adhered to. Robust learning objectives and outcomes to meet the organisation's requirements are needed to prevent delays and cost overruns. Organisations need to identify the key personnel for successfully implementing their e-learning programme - subject matter experts, IT staff, a graphics designer (if available) and the budget holder(s).

If e-learning is new to an organisation there may be multiple approval layers which require additional time to plan for. Limited budgets can still produce good results if they are supported by clear and agreed learning objectives and outcomes. A successful e-learning outcome also depends on organisations providing the information that will underpin the e-learning materials. Delays in providing this information lead to increased costs.

An integrative model of e-learning use: Leveraging theory to understand and increase usage

Authors: Brown, K. G., and Charlier, S. D.

Reference number: 18

Year of publication: 2013

Introduction
Arguably the most dramatic trend in workforce training and development over the last 20 years has been the increased use of e-learning methods to deliver it; however there are concerns about the effectiveness of e-learning.

Key findings
E-learning provides consistency in training (which is particularly important where the workforce is large and geographically dispersed), increased convenience and control of learning for learners, improved monitoring capabilities for employers, and reduced costs by decreasing travel costs and employee absenteeism.

Its drawbacks include higher up-front costs, lack of trainee interaction, and confusion over whether or not providing information constitutes training. Design issues including the technologies used and their reliability are also key factors.

Employee motivation and ability to use technologies are important factors in e-learning participation, along with how the organisation supports their employees to conduct e-learning as part of their daily routine.

Increased learner control does not always result in better outcomes. Although better performance compared to traditional delivery can largely be attributed to differences in instructional design and/or content, learners may not engage sufficiently with the material.

Based on previous research and an existing model of how to influence employee behaviour, the authors devised a number of propositions for organisations to support their e-learning efforts:

- Employees who are resistant to, or less experienced with behaviour change are less likely to utilise e-learning.
- Employees who receive materials early introducing the learning and highlighting the benefits are more likely to use the resources and progress to more advanced stages of behaviour change.
- The higher the perception that the delivery technology is useful, the greater the uptake of e-learning provision by learners.
- The greater the past participation by learners in learning and development, the greater their use of e-learning.
- Individual perceptions of the ease and usefulness of e-learning technology will have a stronger effect if the learner works in a climate that is supportive of e-learning.
- The lower the individual workload of a learner, the greater the use of e-learning will be. Individualised interventions tailored to the learner's stage of change will have a stronger effect on them.
- The stronger the climate for desired change, the more likely learners will make use of e-learning consistent with that change.

How training organisations are using e-learning to support national training initiatives around apprenticeships and RPL[4]

Authors: Callan, V. J., and Fergusson, A.

Reference number: 21

Year of publication: 2009

Key findings

Many organisations are moving away from instructor/organisation-centred approaches to gain more flexibility in learning, and including video and animation simulations to provide more realistic experiences. However, an overemphasis on technology or reliability/integration issues can hinder learning. Social networking technologies are now being used to support peer-peer interactions.

The learning culture needs to be embedded into business processes, behaviours, and organisational systems, without barriers around learning. E-learning can add valuable activities including customised training, skill-gap analysis, pre- and post-mentoring and support, and the provision of e-learning-related advisory services.

One undisputed benefit for organisations adopting e-learning is that they can monitor and measure employee training activity to determine cost-savings, the return on investment, and other efficiencies (e.g. reduced time to develop and update training materials). Another major benefit is the ability to provide standardised, accredited training across different sites. The potential cost-savings could be used to invest in more training.

E-learning is sometimes considered as a business performance improvement tool rather than a training tool. Collaboration between all stakeholders is challenging when implementing flexible e-learning. Ongoing monitoring is required to ensure relevance of the training material and longer-term development of the programmes to meet learner and business expectations.

The major barrier from an employee perspective is time constraints if the system cannot be easily accessed or used, or competing work and family demands take precedence. For small businesses, convenience, flexibility, and access are the key factors driving their use of e-learning. Discouraging its uptake are time, cost, concerns about effectiveness, and a perceived lack of relevance for their business.

Blue Dog (a Queensland training company) notes that the increased access to broadband services is allowing their employers and apprentices to experience alternative training delivery methods, especially among the small to medium businesses which are the mainstays of the Australian construction industry. Online delivery allows these smaller businesses to offer training to their remote learners which they would otherwise be unable to do.

Energy Australia is reported to have saved AU$100,000 per annum in staff training costs because e-learning reduced the frequency of workers having to attend their training centre, and decreased significantly the time taken for course delivery.

The Australian stainless steel industry is also using e-learning to compensate for their workers' lower literacy and numeracy skills through animations and being able to deliver training from the perspective of someone actually undertaking the tasks.

[4] Recognition of Prior Learning

The online oxymoron: Teaching HRD through an impersonal medium

Author: Callahan, J.

Reference number: 22

Year of publication: 2010

Introduction
Many organisations are automatically adopting e-learning approaches for their Human Resources and Development (HRD) training. HRD training, however, has at its core interaction, relationships, dialogue, and emotion which are all much harder to achieve in e-learning environments.

Key findings
An uninformed approach may not take into account key factors of determining the learning outcomes before deciding whether or not to adopt e-learning and which technologies to use.

Online learning can be highly effective for teaching basic HRD training. However, more complex tasks such as facilitating a training session with an unruly participant are less likely to be effective in virtual learning environments. These complex tasks are also more likely to take considerably longer to achieve in e-learning environments compared to traditional delivery.

If workers are unable to easily access high-speed internet, or have insufficient time for the learning then the key benefits of flexibility and convenience are likely to be foregone.

The costs savings associated with e-learning may merely be a transfer of costs from organisations to individuals. For example, both workers and trainers need to develop the necessary skills and capabilities, at their own expense and effort, to effectively participate in e-learning training environments.

The tendency to relegate compliance-type training to e-learning environments can trivialise its real importance for organisations and their workers.

Strategic management of workplace e-learning

Authors: Caudill, J. G. and Reeves, B.

Reference number: 24

Year of publication: 2014

Introduction
Despite the recent economic downturn, businesses are continuing to invest in e-learning for their employees. E-learning presents great opportunities for firms. But it will not be effective if it is not accompanied by proper planning and execution as part of a firm's strategic plan and linked to their organisational goals and objectives.

Key findings
Workplace e-learning should create value for customers and increase the wealth of shareholders, by learners applying knowledge gained through training to the core functions of the business (sales or services). Therefore, the strategic planning of workplace e-learning begins with identifying what these core function(s) are.

Learning and mastering new ways of doing things adds value for customers and gives an organisation a competitive advantage. Teaching and learning and organisational issues need to be considered as well as technology.

There are six stages of learning design to create an e-learning programme: needs assessment, content development, media development, testing, production, and assessment. It is critical to include subject matter and training experts in content development so that the materials are relevant to the learner and organisation's goals.

Multimedia is effective for student learning, but is expensive and takes more development time. Testing should be done with IT staff and users to ensure the functionality and stability of the multimedia used.

Significant support is required to launch a new e-learning programme (e.g. management support, instructions on how to access and use it, and oversight and follow-up). This support may also need to extend beyond business hours if workers are expected or need to complete their training at home.

Ongoing assessment of the content, learning outcomes achieved, and delivery methods are required to keep programmes relevant and accessible. Learner competency should be measured before and after undertaking training. If over time organisational performance does not improve the training will need to be adjusted.

E-learning can significantly reduce costs by reaching greater numbers of employees simultaneously with fewer instructors, and ensuring rapid knowledge dissemination. Employees are able to access knowledge as and when they need it. E-learning supports collaborative learning including input from other teams, vendors, end customers, and other members of the whole supply chain.

Many types of compliance training can be performed through e-learning, including training of customers on product/equipment use. Compliance training sessions can be tracked and documented to save costs and record compliance. Customer-focused sales training through e-learning is a powerful tool to ensure that sales staff have sufficient knowledge of the products they sell and in the sales methods they use. This training can be accessed while in the field.

Three important questions for measuring the effectiveness of an e-learning programme are:
1. What is the organisation trying to accomplish?
2. How will the organisation know the goal is being achieved?
3. Within what time frame should the results be measured?

E-learning ecosystem (ELES) - A holistic approach for the development of more effective learning environment for small-to-medium sized enterprises (SMEs)

Authors: Chang, V., and Guetl, C.

Reference number: 25

Year of publication: 2006

Introduction

The learner's background should be taken into account when adopting e-learning approaches. This should be comprehensive and include key demographic information (e.g. gender and age) as well as their learning history such as previous levels of attainment, and their motivation and familiarity with technology.

Learners want to maximise their e-learning opportunities. Their objectives in using the e-learning materials should also be clear. The necessary infrastructure and support must also be in place.

Key findings

To maximise the use of e-learning, SMEs should consider establishing collaborative e-learning networks in and around the physical workplace. These networks can help SMEs achieve economies of scale, but they need to be part of the organisational culture to be successful.

The employee's needs in accessing e-learning materials fall on a spectrum from small chunks of just-in-time learning to a formally recognised credential to advance their career.

Learners also need the opportunity to apply their recently acquired knowledge and skills within the workplace.

Annual survey report 2008: Learning and development

Author: Chartered Institute of Personnel and Development (Great Britain)

Reference number: 26

Year of publication: 2008

Methodology
A survey using a structured questionnaire was sent out to the institute's members who were learning, training, and development managers. They had a response rate of 15 percent. They also conducted a small number of follow-up telephone interviews and four experts were asked to provide essays on particular themes.

The survey was biased towards larger organisations but had a sufficient proportion of small and medium-sized enterprises. The majority of respondents were from the private sector, but 38 percent were public sector organisations. About 10 percent were from the voluntary sector.

Key findings
The expected uptake of e-learning to support workplace training has not materialised. Less than half of respondents are using more e-learning and very few who had not done so were considering adopting it in the next 12 months.

Very little time is spent by learning and development specialists in designing and implementing e-learning, and many consider it an inappropriate use of money. Materials need to be non-generic and relevant to the employees' day-to-day work. Positive results were achieved by a national housing provider in the UK through the creation of a library of learning material on their intranet which is available to all staff.

Significantly more public sector organisations have adopted e-learning compared to the private sector. This might be because of government endorsement of e-learning which was one of the key recommendations of the Leitch report.

Most respondents do not think e-learning is a substitute for traditional delivery, and believe it is more effective when combined with other forms of learning.

Larger organisations (more than 5,000 employees) are much more likely to adopt e-learning than smaller ones. Organisations with specific training budgets and greater economic funding are more likely to use e-learning.

Many organisations find that the uptake and completion of e-learning courses by their employees is low, in part because a number of employees do not use computers as part of their daily work.

Pull learning: Ensuring elearners learn through effective design

Author: Childs, M.

Reference number: 29

Year of publication: 2012

Introduction
Push learning pushes all possibly available content onto learners. It assumes learners have no prior knowledge and gives them all content irrespective of whether or not this is necessary. In contrast pull learning is based on learners accessing content as and when they need it, and is underpinned by the theory that all adult learners are self-directed.

Key findings
Technologies to support pull learning include social media and YouTube videos. This more flexible format allows learners to pick and choose what they need in order to complete the task, and demonstrate their understanding of the topic. Examples of pull e-learning content could include case studies, scenarios, or simulations – situations where the learners have to think about a problem and work out a solution. 'Pull' learning techniques are more effective than 'push' ones.

E-learning in industry: Case studies from New Zealand

Author: Clayton, J.

Reference number: 32

Year of publication: 2009

Key findings

The key points noted were:

- E-learning uptake is often driven by the need for more rapid and frequent up-skilling of employees as well as its ability to provide more cost-effective and flexible training.
- Businesses can achieve a return on investment and offset the implementation costs associated with e-learning through the benefits of a more skilled workforce.
- E-learning allows businesses to more easily and effectively monitor their employees' compliance status with legislation and the like, as well as providing training to address any of their shortcomings in this context.
- E-learning is being used to support businesses' induction processes, procedures, and requirements as well as increasing employees' ICT skills.
- It has helped identify employee literacy and numeracy issues that need to be addressed and has also improved intra-organisational collaboration.
- E-learning allows for a consistency of approach and a quality of teaching of core skills that is not possible through traditional delivery.
- E-learning provides employees the opportunity to revisit the aspects of the training they find the most challenging until they have gained competence.

The key barriers to e-learning adoption were reported as organisational and technical, specifically:

- difficulty in assessing the financial benefits of e-learning until it has been adopted
- producing relevant, high quality e-learning materials is expensive as is the development of appropriate supporting infrastructure
- employee resistance or reluctance to use e-learning
- reluctance to recognise e-learning as a suitable method for delivering training by professional associations and other relevant authorities.

Critical success factors were often dependent on the size of the organisation and the potential resources (financial, physical, and human) to support e-learning. However, the common ones identified were:

- Organisations need to have clear plans in place for how e-learning will meet their particular training requirements.
- Senior management support is essential if e-learning adoption is to be successful.
- A clear organisational vision needs to be articulated on the value of e-learning and feedback must be sought from employees to overcome resistance. Overcoming resistance is greatly assisted when the appropriate authorities also recognise the merits of an e-learning approach to training.
- The technical solution needs to be able to meet future demands and integrate seamlessly with existing and planned systems. Failure to do this will add additional and unforeseen costs and delays.
- Feedback from the users' needs to be regularly obtained and the financial costs need to be monitored. This helps demonstrate the cost-effectiveness and acceptance of the e-learning solution(s) adopted.
- Collaboration and cooperation with other similar organisations will establish transferrable universally-accepted practices, standards, and skills.

E-learning activities in Aotearoa/New Zealand Industry Training Organisations: Final report

Authors: Clayton, J., and Elliot, R.

Reference number: 34

Year of publication: 2007

Introduction
This was a Ministry of Education funded report to summarise the e-learning activities occurring in New Zealand Industry Training Organisations (ITOs). While ITOs cannot deliver training they can and should influence the training that is provided, including that delivered by e-learning. For example, they could develop and implement organisation-specific e-learning templates, policies, and guides.

Methodology
The report was underpinned by a literature review and an online survey which was completed by 23 of the (then) 39 ITOs. The largest response was from the ITOs representing small enterprises, and the lowest from those ITOs who serviced large enterprises. Case studies were also conducted.

Key findings
A lack of research and supporting evidence might be impeding the uptake of e-learning to support industry training.

Survey responses indicated that many ITOs representing large organisation were adopting e-learning. However, while a significant number were creating e-learning materials there was an observable trend towards purchasing 'off-the-shelf' solutions and outsourcing content development.

ITOs' senior management and staff do not appear to be aware of the necessary capabilities that staff would require to introduce e-learning. They also appear to be unaware of the capabilities that their providers need to effectively deliver e-learning. Emerging and newer technologies were not typically being used to support e-learning - older technologies such as DVDs and CDs were more prevalent.

Improved tracking of trainee performance was seen as important to ITOs overall, but not for those representing small enterprises. Most ITOs did not think e-learning would improve the quality of their training delivery.

Reducing costs and delivery time were not major drivers for introducing e-learning for ITOs overall, but small and medium-sized enterprises (SMEs) were more likely to think that e-learning could aid their recruitment efforts, even though they were not overly supportive of e-learning in general. Most ITOs, and a larger majority of SMEs, had also not identified their technical infrastructure requirements to support e-learning. Almost none of the SMEs and only a bare majority of the large enterprise ITOs had specifically budgeted for e-learning activities.

The major barriers to e-learning adoption identified by respondents were inappropriate technical infrastructure, the support levels required for trainees with limited ICT skills, costs and staff resistance (only SMEs), the ability to source appropriate content (mostly SMEs), a lack of confidence that trainees could complete e-learning courses independently, and a lack of organisational knowledge to support the successful introduction of e-learning.

ITOs do not have the systems and processes to establish or monitor their trainees' e-learning achievements.

E-learning - effective, engaging, entertaining (and earthquake proof)

Author: Cruickshank, A.

Reference number: 37

Year of publication: 2013

Introduction
The e-learning workplace project that is the basis of this unpublished thesis occurred in Christchurch City Libraries. It involved implementing a new online professional development programme for library staff. A critical context for this programme was the 2011 earthquake which significantly disrupted the libraries' services and operations.

Methodology
The methodology was action research in which the author was both a practitioner and a researcher, with the work community helping co-construct the research. This was supported by a literature review, interviews, and analysing past and current relevant surveys and questionnaires. Other data included a focus group of course participants, participants' learning logs, online forum entries, and relevant data from the Christchurch City Libraries Learning Management System.

Key findings
Time available to complete the programme and line management buy-in were critical because they determined the level of support the trainees received including how much work time could be allocated to this training. The trainees themselves were often reluctant to ask for dedicated time as they felt that they were causing disruption by doing so.

Participants found it challenging to get an appropriate space at work where they could study undisturbed. Limited computer resources were also an issue. And the technology itself often did not work. All these factors meant most participants ended up doing their training at home instead of at work.

Despite these issues, participants self-reported learning a lot and found the course enjoyable and fun. They all reported learning some useful skills as a result of participating in the e-learning programme. Trainees also felt more confident in applying these skills in practice after participating in the e-learning programme.

The participants valued the quality and interactivity of the e-learning programme particularly its videos, quizzes, and written content. They also valued its self-directed approach and that its level of difficulty was challenging, but appropriate.

Suggested improvements to the e-learning programme were resolving the associated technical and quality issues of the videos and reducing their length as well as additional questions, optional activities, and a clearer checklist. Making the videos as realistic as possible, rather than having them delivered in a lecture style, would likely increase trainees' engagement with them. Videos were clearly preferred to additional readings. Changing the online forums to more of a supporting role would be more likely to increase trainees' engagement with them.

Tutor support via regular emails was valued by the trainees, but some suggested that this support should be extended to more actively encouraging and supporting trainees who were finding the course difficult to build their confidence rather than just emphasising skills acquisition. Pairing students up with more experienced peers had mixed results. Mentoring too was seen as problematic mainly because it was unclear who in their professional context could adequately and willingly take on this role.

While trainees overall enjoyed and valued their e-learning experiences they felt that future iterations of this programme should be delivered as part of a blended delivery model where some traditional delivery was present instead of this version which was fully online.

E-learning in workplaces

Authors: Daneshgar, F., Van Toorn, C., and Chan, E.

Reference number: 38

Year of publication: 2008

Background
There are many similarities between e-learning in higher education institutions and e-learning in the workplace.

Methodology
This study was based on a literature review on e-learning applied to the workplace.

Key findings
In corporate e-learning an optimal combination of seven principles is needed:
1) addressing individual differences
2) motivating the learner
3) avoiding information overload
4) creating a real-life context
5) encouraging social interactions
6) providing hands-on activities
7) encouraging learner reflection.

The four major organisational issues in e-learning are: leadership, structural, and cultural issues; design issues; technological issues; and delivery issues.

E-learning provides more value for highly skilled employees and generally should not be used for low skilled workers. E-learning needs to be relevant, accessible, and 'user-friendly'. Employees need to learn how to socialise and collaborate in virtual learning environments.

The technology component needs to be well designed, easy to navigate and well supported. It also needs to be standards-based, scalable, and interoperable.

E-learning for adult literacy, language and numeracy: Summary of findings

Authors: Davis, N., and Fletcher, J.

Reference number: 42

Year of publication: 2010

Introduction
This research project was funded by the Ministry of Education. Its main research question was: 'what characteristics of programmes (delivered by a range of methods including e-learning) have been successful in raising the literacy, language and numeracy (LLN) skills of adult learners and could be used to supplement workplace training.'

Methodology
The research project included an international literature review, online seminars involving international experts, over 30 interviews, and case studies.

Key findings
Adult learners are more likely to adopt e-learning approaches if they are relevant to their work context and allow them to acquire useful ICT skills. However, many adults do not have access to computers at work and have limited exposure to them outside work. This is especially true for older workers and those returning to the workforce after a protracted absence.

Dedicated time for e-learning and insufficient management support are noted as other impediments to successful e-learning.

E-learning in larger organisations was more mature and better integrated than in smaller organisations where there are fewer opportunities for in-house development.

Blended approaches are the most effective for LLN acquisition, for example a mix of traditional delivery, a range of technologies (both audio and video including older ones such as CD-ROMs), and collaboration and community involvement.

Mobile learning (which occurs through the use of mobile devices such as phones and iPads) can increase the flexibility of LLN delivery. Mobile learning is more likely to be successful if there are effective collaborations between designers, instructors, learners, and employers to ensure that LLN development has realistic expectations and fits well with workplace routines and safety (for example, picture, audio and/or text instructions to develop skills for selecting and fitting car components). The report recommended that employers provide their employees with those applications best able to help develop the LLN skills required in their respective workplaces.

Professional development is necessary for workplace trainers to adopt e-learning practices and approaches. Support for this development can come from communities of practice (including LLN specialists and vocational sector staff) that are underpinned by online mentoring and accreditation of the development.

Critical success factors in e-learning for small and medium enterprises

Authors: Elliot, R., and Clayton, J.

Reference number: 46

Year of publication: 2009

Introduction
This paper is based on a Ministry of Education funded research project which examined how e-learning was being used to build workforce capability in New Zealand. During the course of this project some of the literature and associated case studies identified a number of critical success factors for small and medium-sized enterprises (SMEs) wishing to implement e-learning (i.e. firms with less than 100 employees).

Key findings
The critical success factors for SMEs wishing to introduce e-learning included:

- **Awareness**: e-learning's benefits are accepted by senior managers/owners of SMEs. This commitment is demonstrated by the allocation of sufficient fiscal, human, and physical resources for e-learning's activities to be deployed, supported, and sustained.
- **Identification**: SMEs are clearly able to establish how e-learning can be successfully incorporated within their current training plans, including the identification of recognised e-learning providers and potential collaborative offerings.
- **Implementation**: an e-learning training plan is developed and offered to employees. During the implementation phase, perceptual evaluations are conducted to assess the effectiveness and impact of the firm's e-learning.
- **Evaluation**: the impact on the organisation of the e-learning training plan is assessed. The results of this assessment are communicated to all stakeholders including owners, managers, and employees. Changes and/or improvements to the training plan are made as a result of the formal assessment.
- **Sustainability**: after the initial e-learning activities have been delivered, post e-learning support is provided to embed e-learning in normal training practices, for example in induction, employee reviews, and organisational procedures.

From ice age to computer age

Author: Eyre, E.

Reference number: 47

Year of publication: 2008

Introduction
The need to keep up with rapidly changing technical developments and the likely mandatory registration of its engineers is putting pressure on the refrigeration industry and its training systems and processes. In response Star Refrigeration (a Scottish company) has set up the industry's first e-learning portal. This portal contains specialised resources that were co-developed with the blended learning provider, REDTRAY.

Key findings
Star Refrigeration won an industry award for their interactive training that allows users to build their skills in a convenient way, at their own pace. Although their solution was based on US experiences, REDTRAY provided customised materials which gave employees more autonomy and responsibility for their own training. The portal's training resources are available for the wider industry (at cost).

Star Refrigeration is intending to link any training gained through their e-learning solution with nationally recognised, properly accredited qualifications.

They are also aiming to further develop the portal by adding a free reference library, a recruitment page, and a supplier directory, as well as using the website to develop an internationally recognised qualification to use for the theoretical training of apprentices who would continue to do the practical components in their workplaces.

Thirsty learners - why is your elearning training failing?

Author: Gross, A.

Reference number: 53

Year of publication: 2012

Introduction
Anecdotal evidence suggests that despite the significant investment and time allocated to e-learning by developers and organisations, learners are not supportive of this approach and even where they are using it, are doing so in inappropriate ways.

Key findings
Learners typically skip through the content as quickly as possible, by either not doing the e-learning at all, not doing it properly, or even cheating.

Many learners have a negative perception of e-learning because (in part) the courses are poorly designed. They often lack the time to undertake e-learning, and may have not the appropriate access or supporting infrastructure or are in a work environment that is not conducive to training.

The organisation may also have done a poor job of introducing, implementing or updating the e-learning which leads to confusion and leaves learners asking why they are doing it.

Organisations can adopt the following steps to obtain better results from their e-learning investments:

- Establish if e-learning is the most appropriate and effective solution.
- Take into account differences in knowledge and requirements between more experienced and new employees.
- Someone in the organisation needs to act as an e-learning ‘champion’.
- Stakeholders need to be involved in the analysis, design, development, and delivery of the e-learning solution including sufficient change communication and support to access and use the e-learning solution.
- Assessments should be engaging and relevant.
- Address different learning styles through a blended approach which combines e-learning with traditional delivery. This includes both groups and staged courses for individuals so they can complete the course over a longer time frame.
- Adopt technologies and strategies to prevent cheating and inappropriate use including obtaining learner agreement not to cheat which could form part of their performance review criteria.
- Allow learner feedback to suggest improvements and report errors.
- Developers should provide a detailed handover plan as part of e-learning’s maintenance contract.
- Undertake evaluations during the e-learning pilot and at least six months after go-live to test its effectiveness. This can be done via Learning Management System data, surveys, or specialist technology for evaluation.
- Modify the learning to ensure it is relevant, engaging and effective.

Online learning attrition rates in university and business settings

Author: Konetes, G.

Reference number: 71

Year of publication: 2010

Introduction
Corporate e-learning (like its university counterparts) is prone to high attrition rates. Some corporate e-learning has recorded attrition rates in excess of 50 percent.

Key findings
The reasons for higher attrition rates in corporate e-learning include time constraints, workplace distractions, technology issues such as a lack of internet access at home, lower employee motivation, inexperienced instructors, badly designed courses, and lack of incentives for employees to complete.

Corporations operating in financially constrained environments may not have the means to provide acceptable online learning for their employees. Even if they did offer high quality e-learning, employee disinterest may counter their efforts.

Greater investment and action on multiple levels is required to achieve optimal results in corporate e-learning.

E-learning and mature-aged learners

Author: Lewis, A.

Reference number: 76

Year of publication: 2009

Introduction
One of e-learning's greatest attractions is its ability to create, foster, deliver, and facilitate learning anytime, anywhere. However, this can lead to procrastination for home-based learners, and challenges for older trainees.

Key findings
Isolation and lack of IT skills can also hinder participation in e-learning.

Not allocating sufficient time, underestimating the required workload and an absence of face-to-face communication also meant many learners lacked confidence to participate in a 'public' environment. Orientation can be provided to assist mature-aged learners with an overview of what is required and how to do basic tasks such as creating posts and uploading content.

Creating a blended environment that combines e-learning with traditional delivery is also likely to contribute to more successful outcomes.

It is important to recognise that mature-aged learners are more likely to have work and family issues that impact on their ability to successfully complete e-learning courses. This requires discussion prior to a course if it cannot be included in the form of pre-course orientation.

Shaping the blends

Author: Little, B.

Reference number: 81

Year of publication: 2006

Introduction
Blended learning is a combination of e-learning and traditional methods used to deliver training and education. One way to do this is to supplement traditional delivery with digital resources before and after the course. Organisational case studies suggest that adopting blended learning significantly reduces the amount of time it takes for employees to achieve required competence levels.

Key findings
The two main criticisms of blended learning are firstly that its associated dialogue is overly dominated by jargon and secondly that it is used as a cover by commercial vendors to sell their particular products and services.

Emerging technologies, especially simulations, are increasingly being used to good effect by organisations to impart soft skills to their employees.

Modern variants of blended learning incorporate technologies that are increasingly used by trainees in work and non-work contexts. They also support the much greater information and compliance requirements expected of modern employees.

However, blended learning has not proven able to effectively incorporate informal learning. To be more effective the blends adopted need to be more sophisticated.

A well constructed blended learning approach provides:

- a consistent delivery of message (e-learning)
- instant and constant access to learning materials as and when required (e-learning)
- a learner-controlled experience (e-learning)
- access to peer-group learning (traditional delivery)
- access to expert knowledge, advice, and guidance (traditional delivery).

Employees are often reluctant to be bound to their desks for lengthy periods working their way through large amounts of e-learning materials. If they encounter technical issues or a lack of managerial support they are likely to discontinue e-learning altogether.

Learning solutions should be driven by resolving a specific learning need, not by the technology.

The organisational culture and technical environment also need to be well understood so that a solution fits with the learners' ways of working and learning, is supported by middle management, and aligns with the existing ICT infrastructure and skill levels.

elearning in local government

Author: Ly, N.

Reference number: 86

Year of publication: 2012

Introduction
This report looked at e-learning in Australia's local government sector.

Key findings
E-learning can overcome problems associated with the isolation of professionals within their organisations and across geographically dispersed localities.

For Australian local councils, the benefits associated with e-learning included potential cost and time savings, and support of employee induction. The barriers to e-learning were the need to provide adequate resources and time for employees to undertake it, the need to address negative views including the perception that it is not 'real work' and, class size.

Local councils also need to provide the required hardware and software and ensure alternate access, such as CD-ROMs, for employees undertaking home-based learning. E-learning in the workplace also needs to be supported by managers including them ensuring time is allocated for employees to engage with it.

For learners, the associated benefits of e-learning included the flexibility of balancing existing personal and professional commitments, the portability of mobile technologies, and the ability to undertake self-paced learning at a time and place of the employee's choosing. Its availability in remote and rural areas was also noted.

Some of the barriers for learners were: a need for technical skills, access to technology and technical support, limited face-to-face interactions with instructors and peers, the need for motivation and self-discipline, the ability to seek out relevant learning opportunities, and the need to adapt to a new way of learning. E-learning also needed to be better aligned with actual work rather than being targeted at a theoretical level. For some learners used to traditional delivery e-learning initially can be both disorienting and daunting.

Various delivery options and supporting technologies are used by Australia's local councils. These include webinars, e-mentoring, web-based modules, blended learning approaches, Learning Management Systems (e.g. Blackboard and Moodle), wikis, weblogs, mobile devices (e.g. laptops, tablets, and smart phones), Skype, MSN Messenger, and multimedia (e.g. graphics, audio, video, and animation).

A portal has been developed listing existing Australian and international local government e-learning programmes and initiatives. It also lists web-based tools, software tools/applications, and other appropriate technological solutions to support e-learning delivery, as well as providing a discussion board to allow users to share, contribute, and discuss their experiences and opinions on e-learning in Australian local government. Finally it makes available a list of links and resources such as websites, articles, publications, case studies, tools, and guides for generating online content.

Valuing elearning

Author: Moran, B.

Reference number: 94

Year of publication: 2011

Introduction
According to an Australian Department of Education 2010 employer survey 50 percent of Australian businesses were using e-learning, 60 percent were expecting to increase their use of e-learning, and 85 percent would encourage their employees to use it for training.

Methodology
This survey did not differentiate between self-paced, interactive approaches or the more traditional e-learning environments which are typically static and instructor/organisation centred.

Key findings
When e-learning and traditional delivery is combined in a blended approach they provide a significant improvement in learner achievement. It is important that the gap between learners' existing knowledge and the knowledge they are expected to acquire is not too large.

If e-learning is used to deliver content that is entirely new or out of context for the learner it should be supported by traditional delivery.

As e-learning's development costs are likely to be significant, a number of factors need to be considered - how many learners will be involved, how often will the training be repeated, and is there travel involved?

E-learning can save money when large numbers of employees need to be trained and are geographically dispersed. It can also be cost effective where the training needs to be repeated, such as for compliance or re-certification, and where an organisation can effectively utilise its existing technologies and ICT infrastructure.

E-learning can provide consistency in content, accuracy of delivery, centralised updating of key messages, and clear version control.

There is a balance between interaction permitting greater learning flexibility and too much freedom causing confusion and disorientation. Typically learners prefer a clear structure and sequence with the option to interact in an order of their choosing.

The learner looks for clear signposts in the e-learning course so they can self-monitor their location and progress. Good aesthetic design including the visual presentation and navigation can have positive effects on motivation and learner achievement.

The design used throughout an e-learning course impacts on its usability and learner perceptions. If the course commences with poor design, the chance for any learning to occur is very small.

Cutting edge or cutting loose? An exploration of apprentices' experiences of workplace e-learning

Author: Mullin, T.

Reference number: 97

Year of publication: 2013

Introduction
This study focuses on the use of e-learning within the UK's hairdressing sector.

Key findings
A number of barriers to workplace e-learning were identified including:

- a lack of awareness and engagement with e-learning among employers, especially small and medium-sized enterprises (which predominate in the UK's hairdressing sector)
- e-learning, when not embedded in daily tasks, was less successful
- a lack of ICT skills among employees in some sectors
- overcoming users' objections to e-learning (including the belief that ICT is not necessary to cut hair)
- lack of access to computers both in the workplace and personally (employers may need to consider providing laptops for the duration of the programme)
- a lack of the requisite skills and knowledge to implement e-learning
- the lower levels of literacy among young participants (raised with technological and social slang, and less emphasis on correct spelling)
- the upfront costs for developing e-learning materials,
- a conflict between course-related activities and workplace commitments was recorded by participants, and e-learning at home tapered off due to distractions and lack of support
- the lack of access to instructional media.

Benefits reported by participants were:

- that e-learning made a positive contribution to apprentices' workplace learning
- it was viewed as being fun and motivating (especially the interactive and gaming elements) as well as having the potential to speed up course progression and act as a reference and training guide
- it was used primarily to support workplace tasks, formal learning (at work), and informal learning and communications (at home and via social media)
- an opportunity to interact with non-workplace communities
- an ability to develop new relationships with staff that were more expert in ICT being able to work alongside novices (even where they were more experienced in the actual workplace).

E-learning should be delivered in manageable amounts of 30-60 minutes per day. Instructor support is required for novice learners to transfer e-learning to workplace practice. Computer access in the workplace and coursework being valued equally with work tasks are also important for successful e-learning. Evidence suggested that e-learning promoted the development of independent learning skills and built employees' confidence.

Five key factors emerged as having an impact on whether e-learning was deemed to be successful and became the cultural 'norm' in the workplace:
1) information and communication technologies (ICT) was seen as being significantly beneficial
2) ICT was introduced and instruction was given simultaneously on how to use it
3) ICT did not create additional work
4) the task was a work requirement or developing another skill
5) whether the user had positive attitudes and beliefs about ICT adoption and use.

A web based intelligent training system for SMEs

Authors: Mullins, R., Duan, Y., Hamblin, D., Burrell, P., Jin, H., Jerzy, G., Ewa, Z., and Aleksander, B.

Reference number: 98

Year of publication: 2007

Introduction

Given their importance to the national economy, the UK's government and service providers have become concerned about small and medium-sized enterprises' (SMEs) lack of engagement with e-business. SMEs are also not exploiting the internet's marketing potential for regional, national and international markets, mainly because of the lack of the necessary skills and knowledge.

TRIMAR (On-Line Intelligent Training System for Internet Marketing by SMEs) is a pilot European Union research project which aims to develop a web-based intelligent training system to aid small business employees in their learning and decision-making regarding the use of the internet in marketing. Most of the training under the TRIMAR project was aimed at the beginner or intermediate level.

Key findings

SMEs lack skills and expertise for internet and non internet-based marketing which were identified as barriers to e-learning. SMEs also have no knowledge of good practice and the associated models in this context used by other SMEs, but would like to know more about this. SME should focus on their needs, strategy, and direction before utilising the internet for marketing and publicity purposes.

Managers expressed an interest in the provision of a web-based training system to aid their learning and knowledge acquisition. The TRIMAR system uses a case study approach which relates the training to actual work, and incorporates knowledge, experience, and good practice from other SMEs.

The TRIMAR system also provided a range of additional information to make it more suitable for target organisations (e.g. grouping questions according to their subject matter and providing content in a range of formats). It was important that SMEs were involved in the development of the TRIMAR system. However, their input was more useful if it was supported by expert facilitation and moderation.

E-learning benefits SMEs in a number of ways because it overcomes the limitations of traditional delivery which include reducing the costs associated with knowledge acquisition, allowing employees to access critical knowledge at a time and location of their choosing, allowing managers to study without being absent from work so they are not excluded from their everyday duties and decision making, allowing self-paced and more customised learning to occur, allowing repeated access to content, and providing more individualised support to learners.

The linkage between the self assessment tool, training modules, and case retrieval system is a core aspect of the TRIMAR system. This linkage encourages interactivity and participation between the SME employee and TRIMAR. The materials are more engaging because they are context sensitive and relate to the SME's actual work environment, and this linkage also provides the necessary feedback and support.

Self-assessment enables the system to direct users to an appropriate lesson at the right level. Training modules deliver basic or advanced levels of knowledge regarding internet marketing. Case retrieval allows for case comparison and development of reasoning, problem solving, and decision making skills.

What makes a good elearning program?

Authors: O'Toole, S., and Keating, G.

Reference number: 105

Year of publication: 2011

Introduction
Too often the 'e' in e-learning represents offline practices being replicated online such as the use of static content in the form of PowerPoint presentations and PDF files. 'E' should stand for exciting, emotive, and energetic where it is stimulating users rather than being reliant on reading static content.

Key findings
It is crucial that an organisation analyses its needs, especially the desired learning outcomes, before determining the appropriate tools and methods to deliver e-learning. E-learning content needs to be well integrated with the larger programme of learning.

A good 'look and feel' supported by appropriate colour, font size, and quantity of text is crucial, as is the blend of interactivity. An avatar[5] can also be used as a navigational guide.

Active learning can be promoted through quizzes, activities, and decision-making scenarios. Interaction can be in real-time (synchronous) or delayed (asynchronous). The text and audio components of an e-learning programme must never be in conflict.

Short modules of between five and ten minutes work best to accommodate employee attention spans, scheduling conflicts, and infrastructure and systems loads and performance.

A Learning Management System can deliver, track, and manage learning content and manage a range of analytics to assist in assessment and programme evaluation.

E-learning should adopt and utilise social media, for example Facebook or Twitter, wherever possible, for example as a platform for a virtual community of practice to investigate, exchange information, and promote ideas with like-minded people.

Web-conferencing tools and 'webinars' need additional supporting tools and technologies to ensure all participants contribute to the discussions, for example whiteboards, polls, and chat functions.

E-learning is more likely to be successful and not viewed as a potentially meaningless distraction if there is a concentration on the learning rather than the technology.

[5] An avatar is a character or real-life representation of an unspecified individual that is used for interactions in virtual worlds such as Second Life.

The use of an e-learning constructivist solution in workplace learning

Authors: Payne, A. M., Stephenson, J. E., Morris, W. B., Tempest, H. G., Mileham, A., and Griffin, D. K.

Reference number: 109

Year of publication: 2009

Introduction

E-learning has become more popular in workplace training to meet the demands of continuing professional development and general training for employees. But there is a paucity of evidence on the effectiveness of e-learning and its reception by learners.

PIC International (a multinational company headquartered in the US) specialises in pork production. One of their major weaknesses is an overreliance on a small number of breeding boars (male pigs) which means that fertility issues in individual pigs can have major effects. This lack of fertility is often not picked up in a timely manner even though its major cause is known and can be resolved through karyotpying which identifies defective chromosomes.

Methodology

The authors modified a human karyotpying programme through running it virtually and applying it to pigs. 25 male employees at PIC International were tested to assess their karyotpying skills which allowed a direct comparison of their skills before and after the tutorial. In addition, they were asked to complete a questionnaire pre- and post-training. The pre-training questionnaire targeted personal information and their attitudes towards e-learning while the post-training questionnaire was aimed at their feelings towards successfully completing the training and whether this could be attributed to the e-learning programme.

Key findings

The study's results indicated a significant improvement among the participants in their karyotpying skills.

95 percent of the participants reported that the e-learning package was easy to use and they enjoyed the realism of the simulations.

The flexibility of being able to learn at a time, place, and pace of their choosing, and the ability to make mistakes without embarrassment were also appreciated.

The structure of the course prompted greater learner engagement and motivation.

Integrating formal and informal learning in an agile organisation: A 'choose your own' adventure model for the delivery of organisational training

Author: Rasmussen, P.

Reference number: 115

Year of publication: 2012

Introduction

A blended approach that combines traditional delivery and e-learning is necessary for all of an organisation's training to ensure: employee access, that the associated infrastructure can cope, that competency is appropriately assessed, learning transfer and learner preferences.

There is also a need to use a blended approach to integrate formal and informal learning so that there are multiple delivery channels with staff having a choice about how they access and interact with materials.

Key findings

Integrating formal and informal learning is more likely if organisations recognise that employees learn in a number of different contexts from varied sources including e-learning.

Training providers and professionals provide formal learning while the employee's managers and colleagues play a critical role assisting with on-the-job informal training which is essential to successfully complete day-to-day tasks.

The end objectives should determine the training approach adopted. If staff need readily available information about specific problems, online texts, an organisational wiki, or shared discussion forum are more likely to be useful than a workshop held six months previously or large amounts of printed text.

Similarly, inductions may be better served by a video presentation, followed up by an e-learning module, and concluding with a quiz.

Staff in remote areas needing formal qualifications could use a CD or have posted materials with regular telephone contact with an assessor and workplace mentor.

The materials and training need to be in as many forms as possible in order to maximise learner engagement, while still providing opportunities to assess and ensure competency. For example e-learning needs to be supported by paper-based equivalents as well as being backed up by a workplace 'buddy' and formal face-to-face learning.

Enabling the effective take-up of e-learning by custodial officers

Author: Reason, M.

Reference number: 116

Year of publication: 2011

Introduction
There are a number of benefits Corrective Services New South Wales could gain from adopting e-learning, including being able to more effectively reach a geographically dispersed workforce and reduce costs.

Methodology
A mixed methods approach was adopted which combined survey data with interviews and analysis. The survey was designed and developed from this project's literature review. The survey was sent to all 3,600 Corrective Services New South Wales custodial staff and interviews were conducted with 25 of them. The interview participants were selected because they were participating in a pilot e-learning programme. Most survey respondents were male and aged 36-55 and had worked in their role between 11-20 years.

Key findings
The majority of respondents had no e-learning experience mainly because they were unaware of its availability. This emerged as a real barrier to effective engagement, with all respondents noting the need for better communication from the organisation in promoting e-learning.

However, of those who participated nearly all were very positive about the content and overall experience. When asked if e-learning could replace traditional delivery, respondents were much less positive. They commented that e-learning was not as effective as traditional delivery and was not interactive, especially in supporting question and answer sessions with the facilitator.

Assistance with computer skills was not rated as important by respondents because most custodial officers use computers as part of their day-to-day work. Of most importance was organisational infrastructure. In short, if computers were not available to support the e-learning course this would have a major negative effect on employees' e-learning participation.

Moving e-learning into the business

Author: Roberts, A.

Reference number: 118

Year of publication: 2014

Introduction
While e-learning can deliver significant gains, the challenges are to ensure that it is aligned with the organisational goals and justifying the initial investment. To be successful e-learning needs to be much more than just another Human Resources project.

Key findings
The first priority is to identify the business problem(s) that the training will solve, and how success will be measured as well as establishing the baseline measure. Successful workplace e-learning is all about continual measurement and refinement.

Planning questions should include:

- What are the specific e-learning goals?
- How will e-learning be aligned to the needs of the business?
- What groups and how many employees require or want access to e-learning courses?
- What kinds of e-learning courses are desired?
- Do employees actually want or need to learn online?
- How will e-learning align with and support traditional training methods?
- What are the critical success factors?
- How will results be measured?
- Who will be responsible for the rollout and subsequent maintenance?
- Which executive will act as 'champion' for the e-learning initiative?

Management support is critical.

The following activities should be conducted:

- Needs assessment – is the initiative a necessity or a 'nice to have'.
- Requirements analysis – document and understand internal stakeholder needs.
- User research – assess employee readiness for, and use of, e-learning.
- Feasibility study – identifying the potential barriers to success and agreeing a reasonable implementation time and cost.
- Strategic plan - document specific objectives and goals and how they align with organisational goals.
- Communication plan –marketing the initiative to ensure uptake.
- Business case –proves the cost benefit analysis and return on investment.
- Measurement plan – detail the critical success factors and performance measures (e.g. employee uptake and return on investment).

Some of the major benefits to organisations who adopt e-learning are:
- Reduced time spent away from the job which is as valuable as the decrease in direct costs such as instructor salaries and employee travel.
- Learning times reduced by an average of 40 to 60 percent.
- Increased retention and application to the job averages an increase of over 25 percent compared to traditional methods.
- Expert knowledge is communicated, and more importantly captured with good e-learning and knowledge management systems.
- Proof of completion and certification can be automatically recorded and are auditable.
- Just-in-time learning rather than enrolling in a programme months before the learning will be applied.

Optimising work-based e-learning in small and medium-sized enterprises: Contemporary challenges

Author: Roffe, I.

Reference number: 119

Year of publication: 2009

Introduction
The major benefits associated with e-learning for managers and employers are its cost effectiveness and increased ability to access learning opportunities at a time and place of their choosing including home or other non-work locations. E-learning can also reduce costs including attendance at off-site courses and the associated absences from work.

Methodology
Case studies across nine small and medium-sized enterprise (SME) owner-managers in west Wales were carried out, as part of a performance development programme conducted by the University of Wales. The SMEs had to be experiencing rapid change because of the impact of technology, had to have worked closely with the author, and had be to attempting to grow while still being located in the same geographical area.

Key findings
E-communication is taking precedence over e-training and formal learning as it provides greater availability and accessibility to information, knowledge, and skills, which is particularly useful for SMEs based in rural or regional areas.

Informal knowledge transfer is supported by instant messaging, internet- or intranet-based chat, web-based meetings, Skype, real-time and near-real-time online collaboration tools, and file transfers. Concerns were noted about the use of the internet for non-work purposes.

Online communities (based around common work-related areas) can be used to support both knowledge development and transfer. They can foster informal learning in specific problem areas, and be a key source of information and support. However these informal learning mechanisms do need to be linked to workplace roles.

A cost-effective means to develop and maintain these online communities is to utilise existing social media infrastructure like Facebook. However, appropriate and secure use is important to protect employees and their businesses.

Despite efficiencies, the costs of e-learning are often under-estimated. These include the costs for developing and delivering programmes, direct employee time, overheads, and capital investment. One method used to support e-learning provision for SMEs is learndirect (a large UK government supported workplace learning initiative) where learning is broken down into small packages delivered by e-learning methods with associated credit assessment. Professionals respond to learner questions by mobile phone or internet.

The success of an e-learning programme is tied to its ability to meet the learning needs of the organisation. Training is typically offered to bridge knowledge skills gaps between current and expected or future work functions.

Evaluation can produce evidence to assist with decisions to enhance the quality and perceived value of e-learning. Both Kirkpatrick's and Brinkerhoff's variant are commonly used evaluation models, but both incur significant costs. Evaluations are also challenged by changing business problems and establishing causal links between performance and e-training. Measurement is therefore often via direct observation of managers and explicit questioning of employees, but caution is needed to ensure the responses reflect embedded learning.

The impact of e-learning on workforce capability: Creating a framework for development

Authors: Saravani, S.-J. and Clayton, J.

Reference number: 123

Year of publication: 2013

Introduction
Being well informed of e-learning best practice is central to improving organisational performance and competitiveness. There is a growing realisation that e-learning plays a critical role by enabling access to training on demand that enables highly-skilled workers and organisational competitiveness. In industry training there is an increased demand for e-learning in part due to its ability to provide mass customisation of workplace training because it can tailor and distribute the necessary learning materials to meet individual workers' needs.

Key findings
The authors recommend a three-stage continuous developmental framework to ensure workplace e-learning is well-planned and follows best practice. This first part relates to trainers:

- Creation: firstly, learning objectives need to be identified, resources must be allocated to meet these, and the understanding of the participants is measured – see 5 D's below.
- Evaluation: secondly, the impact of the e-learning event on the individual or organisation is measured and reported on - see RIAAS below.
- Modification: finally, the impact of the e-learning event is reviewed and modifications to it for future delivery are made - see RAM below.

To assist organisations assess the quality of their e-learning the authors devised the 5 D's:

- Define the e-learning training: identify the skills/competencies to be taught and assessed through e-learning and where this occurs i.e. on- or off-job
- Design the e-learning experience: develop an e-learning plan and incorporate e-learning solutions at identified stages
- Develop the e-learning resources: design and create e-resources and activities which will support the learning in achieving the desired outcomes
- Deliver the e-learning event: identify and apply effective e-learning delivery modes to ensure full learner engagement in the e-learning experience
- Determine the impact of the e-learning experience: evaluate the success of the e-learning for the individual and the organisation and use outcomes to inform the development of future e-learning events (which would follow the same process).

The authors developed the R.I.A.A.S. measurement model to evaluate workplace e-learning, based on the widely used Kirkpatrick-Philips evaluation model:

For the organisation:
- Return on investment which identifies how the investment in e-learning benefited the organisation and make recommendations for future e-learning activities.
- Impact: Measure how e-learning provided impacted on business results.
- Application: Analyse, over time, how employees on-the-job behaviour changed as a result of the e-learning provided.

For the individual: Accomplishment which tests if the employees have acquired the knowledge, skills, and attitudes the e-learning addressed and satisfaction which determines how the employees reacted to the training provided.

Reflection is a critical feature of the quality delivery of e-learning and underpins the following R.A.M. model:

- An organisation needs to *reflect* on their strengths and weaknesses in the integration of e-learning within their structures and processes.
- Identify *action(s)* that will facilitate increased learner understanding of e-learning applications as well as their competence and confidence in using it
- *Measure* and report on the impact learning had on strategic alignment and business operations.

In all cases these evaluations should be conducted by the participants (either individual or organisational) because they have a personal understanding of:

- the underpinning principles used in the design of the e-learning event
- the actual workplace environment where the e-learning activities are deployed
- the constraints (e.g. financial, technical, physical, and strategic) influencing decisions
- organisational drivers or measures
- industry expectations.

Enterprise e-learning success factors: An analysis of practitioners' perspective

Authors: Sela, E., and Sivan, Y. Y.

Reference number: 126

Year of publication: 2009

Introduction
Despite the benefits of cost savings, learning flexibility, better employee retention, unified and updated information, and the ability to provide safe and easy-to-manage learning environments, e-learning projects have high failure rates suggesting there are misconceptions regarding the implementation process and use of e-learning.

Methodology
The authors adopted a combination of unstructured interviews with practitioners, a literature review, and analytic work.

Key findings
The 'must have' factors identified for e-learning implementation are (in no particular order):

- Perceived usefulness and ease of use: relevance to daily work and employee personal benefit. This is especially important when choosing learning materials and as part of 'marketing' e-learning to employees.
- Marketing: helps create a critical mass of users, prevents employee resistance, and raises the awareness of e-learning and its benefits.
- Establishing an organisational culture that overcomes employee resistance, update organisational values and norms; and ensure managers support and encourage e-learning.
- Management support: to guide, direct, and influence employees, and assist them to find the right time to learn. These supportive roles also demonstrate management acceptance of e-learning.
- A real need for the organisation: Interviewees noted that there can be no other viable alternative to e-learning if it is to be successfully adopted.

These less important factors ('nice to have's) identified were (in no particular order):

- Time to learn: time scheduled for learning within the existing work hours.
- Support: technical and peer support, as well as guidance by an instructor.
- Mandatory usage: increases e-learning's effectiveness, but does not guarantee 100 percent participation.
- Incentives to use e-learning: meaningful incentives related to career advancement and peer recognition encourage employees to use e-learning.

TEL in the workplace

Authors: Short, H., and Greener, S.

Reference number: 130

Date of publication: 2014

Key findings

E-learning has a number of advantages over traditional delivery for workplace training including being more flexible and allowing savings in time, money, and travel. E-learning also removes the scheduling and funding constraints that hinder training in small and medium-sized enterprises (SMEs). However, much workplace e-learning provision does not align with organisational goals and individual needs; rather it focuses on technology and generally delivers low-quality, badly designed training that does not achieve its goals.

Many of the problems associated with workplace e-learning stem from the fact that in the main these courses are attempting to replicate traditional delivery in online environments. This is not a good use of the technologies. And it shifts the problems associated with traditional delivery such as poor pedagogies, a lack of learner engagement and accessibility into e-learning environments.

Most employers have a negative view of e-learning's effectiveness and prefer traditional delivery. But nearly all employers think that e-learning is most effective when it is combined with traditional delivery in a blended approach. This appears to be the case in practice as well with little sole e-learning approaches occurring outside of compliance and induction training. Despite this support it is unclear what the most effective integration mechanisms and approaches are to support learning environments that improve on approaches that only incorporate traditional delivery or e-learning.

Some research suggests that informal learning supported by e-learning is more important than formal learning. It is becoming apparent that the really important relationships and interactions in workplace e-learning environments are between people not between individuals and technology. In an e-learning context these relationships can be formalised through communities of practice which are particularly useful for SME employees who often lack sufficient numbers of co-workers to share ideas, knowledge, and resources with.

E-learning has had a greater impact in larger companies than SMEs where it is hindered by the available technologies and the attitudes of owners and their employees. Even where there are clear advantages for SMEs in introducing e-learning such as overcoming infrastructure constraints and training remote workforces the costs may be prohibitive.

Recent surveys suggest only about a tenth to a third of employees actually complete their e-learning courses. This low figure is largely attributed to employees' reluctance to complete training on their own time and/or at home. However, learner motivation is critical. And these low completion rates could also be due to the content which mainly relates to refresher training and where there may be a higher expectation that employees will drop out. Learner support is also critical in improving learner outcomes in workplace e-learning environments.

E-learning

Author: Teasdale, R.

Reference number: 139

Year of publication: 2013

Introduction
Organisations need to consider three things when introducing e-learning: the type of Learning Management System (LMS) to be used; the tools used to develop the materials; and that learners will have access to a suitable internet-enabled device.

Key findings
Deciding what content to develop first is essential and this can be established through focus groups. Because e-learning is delivered remotely it is really important that organisations determine their learning objectives, identify what they really want employees to be able to do following the training, and understand their audience and what motivates them.

E-learning should be part of a blended approach where some traditional delivery components are retained. When considering whether e-learning is the appropriate solution organisations need to consider the following questions:

1) Is it cost effective?
2) Is the content suitable?
3) Does it fit the audience profile?
4) Can it be implemented effectively?
5) Is it feasible to produce?

Some of the common benefits of e-learning are: reduction in travel costs; the marginal cost of delivery post development (in short it can be delivered to as many people and reused as many times as necessary); less employee time off-job; delivery of more consistent learning, and it is easier to assess, schedule, and track training.

However, there are also caveats that organisations need to be aware of: it must be well-designed to be effective; it requires new skills in the teams charged with developing and delivering it; and there needs to be an avoidance of the overuse of technical jargon.

The author recommends the following for organisations commencing their e-learning journey:

- think return on investment from the start
- get buy-in from senior management and leadership teams
- build a support network to assist and encourage the organisation's e-learning development
- careful selection of vendors/suppliers carefully especially the LMS ones and any consultants hired
- allow for 'slippage' in project timelines and budgets
- develop good relationships with IT and graphics staff and/or departments
- document decisions
- collect stories to support the development of scenarios whether they are developed and designed in-house or externally.

Numeracy for adults: Building skills with online learning links

Authors: Thomas, G. and Ward, J.

Reference number: 140

Year of publication: 2010

Introduction
Information and communication technologies (ICT) help in the development of adult learners' numeracy skills by making learning more appealing and accessible (including from home) and by connecting learners for support.

Methodology
These case studies are based on five workers in New Zealand's concrete industry. A variety of online learning activities were selected to meet the numeracy needs of the five workers. Suitable websites were those which met a set of criteria based on research evidence including:

- The content was pitched at the 'gap' between the worker's current knowledge/skills and the numeracy they required.
- The learning required participation and development of reasoning skills rather than just the ability to recall information.
- The learning included cognitively demanding tasks.
- Immediate feedback was provided to the user so they could gauge their performance.
- The sites were accessible and easy to use, with minimal text and appropriate use of audio, video, photos, and diagrams.

Key findings
These online activities (which included games and interactive learning objects) led to measurable gains in the case study participants' numeracy skills which they were able to apply to both their professional and personal contexts. These gains were made in short time frames and in an independent self-directed manner.

However, to scale up this approach several requirements would have to be met:

- Clear identification of the numeracy required for learning tasks to direct learners to the appropriate learning resources.
- Quality online learning activities with relevant content, cognitive tasks, and immediate feedback. The establishment of a 'bank' of appropriate activities that can be used by large numbers of learners would be most cost effective.
- Workers need to understand that the purpose of the learning is to develop the required numeracy knowledge and skills.

E-learning's contribution to workforce development

Author: University of Sydney's Workplace Research Centre

Reference number: 145

Date of publication: 2013

Introduction
This report was commissioned by Australia's Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education to support their national vocational education and training (VET) sector e-learning strategy.

Key findings
The key factors in e-learning promoting skills growth are:

- **Access** – how easy the learning is to access (including the associated tools and the time taken to use it as well as how reliable the supporting environment and systems are), the literacy of learners, the consistency and quality of training, and the support provided during training (such as face-to-face orientation, workbooks and guides).
- **Motivation** – of the organisation and learner, the support required (managerial, specific work time allocation, and collegial networks), awareness of the available training, job design and technology use requirements, integration of learning into the organisation's strategic direction and culture, and relevance to the work tasks.
- **Experience** – previous experience of e-learning and the existing knowledge level of learners.

The key benefits associated with e-learning are:

- It helps improve digital literacy.
- It assists with improving the networks between training providers, industry bodies, and employees.
- It facilitates simultaneous training to multiple workplaces, which could reduce delivery costs per workplace.
- It helps to improve employee motivation for particular types of training, e.g. compliance training.
- It is less disruptive of work schedules.
- It has faster completion rates and greater numbers of staff completing training.
- It provides deeper learning outcomes and application to reduce errors and injuries.
- It creates greater employee confidence with learning, and faster integration of new technology into work processes.
- It supports the broader diffusion of learning and creation of a learning culture.
- Collaborative arrangements can achieve scale as well as allowing participants to obtain quantity discounts and more customised content.

The costs associated with e-learning include:

- Self-paced courses are generally cheaper but may not motivate staff as well.
- Upgrades to IT infrastructure and the up-skilling of staff to develop content, especially in multiple formats because e-learning courses should be accessible through a range of media and devices and be based on adult learning principles.
- While interaction is widely considered to be an essential element of best practice e-learning a blended model that combines e-learning and traditional delivery is generally most effective.

Corporations, support competition and innovation in e-learning education system

Authors: Varga Ungureanu, A., Rascu, S. P., and Ungureanu, A.

Reference number: 147

Year of publication: 2013

Introduction
Corporations worldwide are seeking more efficient and innovative ways to provide workforce training. Increasingly organisations are turning to e-learning to achieve this because it saves the training time and travel costs associated with traditional delivery, provides easier and faster access to knowledge and information, and eliminates geographical and cultural barriers.

Key findings
E-learning is aimed at increasing individual and organisational performance.

E-learning is successful when it is user-friendly with effective access to knowledge and information, has advanced forms of presentation, assimilates and evaluates knowledge, and has differentiated access for learners supported by the necessary tools and technologies.

E-learning supports business competitiveness by helping workers constantly up-skill and transforming the way people work and utilise their spare time. It provides consistent training, better performance monitoring of both trainers and trainees, time savings and improved organisational learning. E-learning can be used for staff professional development as well as customer learning.

E-learning allows a dispersed workforce to be trained simultaneously while eliminating the large costs of doing this through traditional methods.

E-learning allows a standardised approach, which especially benefits small and medium-sized enterprises because it allows them to develop networks, raise their organisational profile, better meet their market needs, and gain more timely access to information and knowledge to meet their future market requirements.

Learners have more ability to safely make mistakes in e-learning environments compared to face-to-face contexts, as well as learn at their own pace. This leads to a 50 percent increase in knowledge retention compared to traditional delivery.

6 FURTHER DEVELOPMENT OF E-LEARNING

Blended learning for soft skills development: Testing a four-level framework for integrating work and learning to maximize personal practice and job performance

Authors: Adams, J. M., Hanesiak, R., Morgan, G., Owston, R., Lupshenyuk, D., and Mills, L.

Reference number: 1

Year of publication: 2010

Introduction
This Canadian-based research study set out to prove or disprove the following hypotheses:
(A) - The tighter and better defined the links are between learning and the job, the more likely participants are to report demonstrable impacts/positive outcomes.
(B) - The tighter and better defined the links are between learning and the job, the more likely participants are to report learning motivators, rather than barriers.
(C) - The closer the match between individual learning styles and the blended approach adopted, the more likely participants are to report positive learning outcomes and impact on personal skill development.

Methodology
Four different blended approaches were used for this study:
Level 1: E-learning is a background resource only.
Level 2: E-learning is used in conjunction with traditional delivery.
Level 3: E-learning is tightly coupled with personal learning objectives and the blend adopted is e-learning and coaching.
Level 4: E-learning is tightly coupled with action projects and the blend adopted is these projects combined with e-learning.

Key findings
Some participants excelled irrespective of the particular blended strategy adopted. No common characteristics could be identified among those who were successful in each of the approaches. The only hypothesis that was proven was A when e-learning was blended with traditional delivery and supported by coaching.

The primary motivators were consistent across all learners and were: relevance of content to the participant's work, flexibility in time, and ability for the training and development to be self-paced. There was less agreement on the barriers but the most common ones were vague instructions, insufficient feedback, and time management.

Organisations should offer learners as much choice as possible.
- They should have regularly scheduled learning over time.
- They should encourage learners to take as much accountability as possible for their training and development outcomes to ensure tighter links are created between work and learning.
- Pre- and post-tests should be used to evaluate outcomes.
- Learning should be acknowledged and rewarded in meaningful ways for learners.
- Training departments need a mandate to continuously improve even if it means discarding well established programmes when they are clearly not performing to expected or required levels.

Creating ‘anywhere, anytime’ learning

Author: Addison, M.

Reference number: 2

Year of publication: 2009

Introduction
The demand for shorter training sessions provides organisations with an opportunity to provide learning anytime, anywhere through the adoption of e-learning approaches.

Key findings
- As organisations increase their expenditure on e-learning they need to remember the importance of relationships and engagement, which is additional to disseminating content.
- E-learning, especially through the use of social media, can widen employees’ networks which in turn can be utilised to support their learning.
- Learners who already have personal devices are able to access the necessary learning content. However, they need assistance to use this content effectively.
- Organisational learning departments should innovate and use their budgets in different ways to fully utilise technology.

Maturing learning: Mashup personal learning environments

Authors: Attwell, G., Bimrose, J., Brown, A., and Barnes, S.-A.

Reference number: 5

Year of publication: 2008

Introduction

This study is based on personal advisors (PAs) working for a community-based organisation in the United Kingdom that offers career advice, guidance, and associated services to its 13-19 year olds.

This article looks at a project that was intended to develop an online personal learning environment (PLE) for these PAs who are required to access recorded knowledge, analyse it, blend it with informal (tacit) knowledge, and then share, disseminate or incorporate this new knowledge into formal learning systems.

Key findings

The PLE would most likely include tools for authoring, creating, and editing artefacts as well as using services to support PAs in developing models and maps of their contextual knowledge. Tools to achieve this might include weblogs, e-portfolios, and social networking services.

Using a PLE results in learning which is learner driven, problem-based, and motivated by ongoing interest; rather than a learning process triggered by an external provider.

Development of organizational learning through web based training

Authors: Bazae, G. A., Barat, N., and Asgharpoor, D. K.

Reference number: 8

Year of publication: 2010

Introduction
There are two different approaches organisations typically adopt for e-learning. One is to treat the supporting technologies as tools. The other adopts technology to support distributed learning. This article focuses on the second approach.

Key findings
E-learning can allow substantive savings to be made h compared to traditional delivery as there are reduced employee travel, lost work hours and delivery support costs. Organisations need to consider these core issues before implementing e-learning:

- Defining the mission and significance to their organisation.
- Identifying the activities and needs of the organisation.
- Assessing what other organisations are doing and specifying a set of evaluation standards.
- Establishing priorities.
- Researching, and then designing, the best guidelines and implementation plans to support the introduction of e-learning. The design team should include managers, trainers, and IT experts.
- The investment and preparation for adopting technology to support e-learning.

E-learning's scope needs to be clearly articulated and adhered to as well as being integrated with existing programmes and activities. Key stakeholders need to be identified and appropriately consulted. Trainers and trainees need to have the necessary skills to improve the likelihood of success.

Web-based content should be used when the organisation is geographically dispersed and the trainees need to access the system from anywhere at any time. Local networks can be used when a group of trainees in the same location receive the training. Training can be delivered using multimedia in real-time and/or near-time. Training can also be personalised using e-learning methods.

How do your training practices measure up?

Author: Blain, J.

Reference number: 13

Year of publication: 2008

Introduction
This article is based on a pan-European survey of over 1,000 companies employing more than 500 staff.

Key findings
The overall trends identified were the growing popularity for blended and e-learning and the rise of learner-driven training.

Blended learning's increased popularity is due in part to its business benefits which include a decrease in costs, increased speed of learning, and making training more accessible to a wider audience.

Despite its potential, e-learning has often focused on technology at the expense of the learners. However, recent efforts have benefited from more user-friendly interfaces and an ability to align learning events with individual and corporate goals which engage organisations and their employees equally.

Traditional delivery is seen as being most useful to support role playing and authentic workplace scenarios, while e-learning is best for reinforcing the skills development process and adds the most value when used for acquiring knowledge because it enables learners to progressively track their development.

The rise of blended and e-learning is also being driven by learners themselves who are more comfortable with using technologies and want interactive and more personalised learning delivered on a range of platforms, technologies, and devices. Reduced funding and the need to fit training in with daily work are also driving the increase in workplace blended and e-learning approaches.

E-learning gives learners more control over the learning process which in turn increases their motivation and engagement. Blended and e-learning also supports frontline managers by providing them with the competencies they need to manage their staff more effectively.

Dynamics of e-learning: Theoretical and practical perspectives

Authors: Bondarouk, T., and Ruël, H.

Reference number: 14

Year of publication: 2010

Introduction

Many organisations use asynchronous (delayed-time) e-learning in the form of simulation games, video, and audio. However, these tools and technologies may be insufficient to meet the requirements of on-demand employee training.

Key findings

There is now greater emphasis on social media-based interactions and the increasing replacement of traditional delivery by networked e-learning options that offer real-time, video-supported, social e-learning.

E-learning has the potential to address regulatory compliance requirements, meet business needs, retrain employees, and offer customer support at a low recurring cost. It can also empower learners by providing them with on-demand access to learning at a time of their choosing. However, poorly designed e-learning courses can overload learners without delivering the essential training processes including feedback.

E-learning has high upfront costs which may see companies restrict its role to one of information provision only. E-learning should be viewed as an investment in learners' competencies and as organisational talent management rather than as an immediate and short-term business case.

Web-based technologies can also support and encourage social interaction among trainees and between trainees and instructors which is often absent in corporate e-learning environments. Of particular importance is that the internet and its associated technologies allow learners to access and construct knowledge independently of the training process and supports them in establishing their own training objectives.

The present and future state of blended learning in workplace learning settings in the United States

Authors: Bonk, C. J., Kim, K.-J., Oh, E. J., Teng, Y.-T., and Son, S. J.

Reference number: 15

Year of publication: 2007

Introduction

The common factors driving decisions about the use of blended learning are:
1) how stable the content is
2) the time available for development and implementation
3) whether human interaction is essential to achieve the learning goals
4) the extent of the budget
5) whether or not the learning resource is reusable and can be referenced in the future
6) whether the nature of the learning activities and the learners' situation is individual or social.

Although employees often have better work performance after participating in blended learning compared to other forms of training, there are still a number of barriers including personal, learning style, instructional, organisational, situational, content stability, and technological.

Methodology

The study is based on a survey of training professionals from a range of US companies which included government and non-profits using a self-administered questionnaire. This questionnaire was also distributed to several online forums and web platforms for US training professionals.

Key findings

The uptake of workplace blended learning is driven primarily by a desire to improve the accessibility and availability of learning, the quality of the learning experience, and an ability to achieve cost reductions.

The biggest obstacles to implementing workplace blended learning approaches noted were the rapidly changing technologies and insufficient management support and commitment. A lack of understanding was hindering blended learning's uptake in the workplace.

The study uncovered a trend that emphasises learner-centred, problem-based, and team-based approaches over instructor-centred ones in blended workplace learning environments.

Favoured technologies to support workplace blended learning included webcasting, video streaming, and wireless and mobile technologies. Interestingly, respondents did not favour tools such as wikis and weblogs that would grant increased empowerment to learners despite the trend of more learner-centred training environments.

Respondents indicated that the quality of their blended learning would be measured most often in relation to its benefits to their organisation such as employee performance, return on investment, and cost-benefit analyses.

Training in the live online space! Is anybody out there?

Author: Buhagiar, A.

Reference number: 19

Year of publication: 2012

Introduction
Live online training sessions provide organisations with an opportunity to realise significant returns on investment. But to obtain these benefits it is important that certain processes and procedures are followed.

Key findings
Ensure that learners can access and use the equipment by getting them to test it at least one week prior to course commencement.

The role of particular technologies needs to be determined. For example, are icons to be used for asking questions or the course's chat facilities?

Participants need to be informed about what they need to bring and do during the session.

Assistant moderators can be useful to address technical difficulties.

Sessions should be recorded so that necessary improvements and adjustments can be made.

A unique design for high-impact safety and awareness training

Authors: Calandra, B., and Harmon, S. W.

Reference number: 20

Year of publication: 2012

Introduction
The e-learning course in this study was developed for CARE Academy[6] in the US to train their poverty-relief workers in safety and awareness.

Methodology
A low-bandwidth web-based training solution was adopted. Users without internet access had the option of using a CD-ROM. Due to the unique nature of their course objectives, they developed simulations that were text-based and based on the trainees' real-life work scenarios.

These simulations were supported by web-based templates and took an iterative development approach. Their final high-level course structure was based on security and safety in four different contexts: travelling, at home, at work, and in the field. The training was available in five languages: English, French, Spanish, Portuguese, and Arabic, and the web-based components were distributed via the organisation's Learning Management System.

Key findings
The learners needed to be well prepared to meet their expectations for this type of training as it did not follow the structures, practices, and processes of a more 'traditional' e-learning course (which are supported by carefully pre-planned instructional design to assist learners meet pre-determined goals and objectives).

The key information to transfer was voluminous, so it needed to be reduced to a few core principles in order for it to be manageable and useful for both instructors and trainees, many of whom were novices.

They managed to reduce all the information to one core principle which underpinned all their training efforts: risk = threat x vulnerability. In other words in order for learners to determine their risk in any given situation they needed to assess the degree and likelihood of a given threat and their vulnerability to that particular threat.

[6] CARE Academy is the learning arm of CARE International which is a federation of 14 member countries including the US and Australia. They are, dedicated to the eradication of poverty in the developing world through the provision of emergency aid where required and working alongside affected communities, individuals, and families.

Research on e-learning in the workplace: A bibliometric analysis of the literature 2000-2012

Authors: Cheng, B., Wang, M., Mørch, A. I., Chen, N.-S., Kinshuk, and Spector, J. M.

Reference number: 28

Year of publication: 2014

Introduction
By virtue of its benefits in just-in-time delivery and cost efficiency, e-learning accounts for a significant proportion of corporate training investment.

Methodology
This study analysed 324 relevant articles published in academic journals and conference proceedings from 2000 to 2012, with the aim of discovering the major research themes and knowledge structure of workplace e-learning. They also searched one comprehensive database using the search terms workplace, learning, training, web, online, and e-learning to select the study's literature.

Key findings
Common uses of e-learning in workplace learning were continuing education, computer-assisted training for professional development, computer-assisted occupational health and safety education, computer-assisted healthcare and nursing education, social media for informal learning, and knowledge management.

Social media for informal learning is mainly about technology-enhanced social interactions to support knowledge sharing among peers. The use of social media and networking tools have significantly improved knowledge creation and sharing in the workplace. However, these studies do not take into account the social and collaborative behaviours needed to support effective use of these tools such as trust and self-directedness.

In contrast, knowledge management is about capturing and embedding integral corporate knowledge used in day to day activities (often referred to as tacit knowledge). E-learning has integrated formal and informal learning to provide more expansive and flexible approaches to workplace and lifelong learning.

Organisations that adopt a blended delivery of traditional and e-learning techniques and integrate these with technology, teaching, and learning stand to make the biggest gains. E-learning needs to support and facilitate the connection between problem solving and knowledge construction, and address individual needs as well as organisational goals.

E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning, third edition

Authors: Clark, R. C., and Mayer, R. E.

Reference number: 31

Year of publication: 2011

Key findings

The benefits of e-learning for organisations and their employees include customised training based on work roles and employees' prior knowledge; utilising a range of technologies; and immersing learners in authentic environments that require them to solve infrequent problems or complex tasks.

The pitfalls include inappropriate technology use, for example too much emphasis on particular ones such as animations, or text-heavy approaches that are not interactive and do not promote practice. Workplace training is used to **inform** employees (e.g. orientation for new workers) or to **perform** near or far goals (e.g. designing a database); near or far also refers to how quickly training can be applied to an employee's daily tasks[7].

E-learning architectures typically fall into three types:

- receptive - acquire information, typically used for informing
- directive – medium interactivity for procedural training to novice employees (e.g. software skills)
- guided discovery – highly interactive for strategic training to experienced employees (e.g. problem solving).

Experienced learners are more likely to benefit from a 'technology-rich' environment whereas those at the novice stage may find these environments challenging making courseware far less effective. Four key processes support effective e-learning:

- the environment must point learners to key graphics and words to easily select appropriate content
- the lesson knowledge must be effectively integrated with work knowledge
- the environment must have only relevant information via the appropriate technologies
- e-learning must relate to the learner's actual work so that learners can easily apply it to their job.

Some key technology guides for organisations are:

- Animations should be used primarily to illustrate hands-on procedures.
- Feedback should be as informative as possible and not separated from the questions or learners' responses.
- Audio narration is useful to explain on-screen graphics and/or animations.
- Text is preferable for technical terms or directions to practice exercises, and when the language used is challenging.
- Text and audio should not be combined except where short text labels are expanded through audio narration.
- Audio should be used so the avatars can 'speak' and exhibit human behaviours.
- Content should be presented in manageable segments with pauses supported by animations at appropriate points. Links should also be used.
- Games and simulations should be matched to learners who are motivated to initiate or complete learning goals, and relevant to the employees' prior knowledge and workplace requirements. They should also be easy to use by adopting simple interface design and ensuring pre-training is provided.

[7] Near is where training can be applied immediately or close to daily tasks. In contrast, far is where the training can only typically be assigned to daily tasks in the medium- to long-term.

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

Authors: Clayton, J., Elliot, R., Saravani, S-J., Huntington, N., and Greene, N.

Reference number: 33

Year of publication: 2008

Introduction
This was a Ministry of Education funded project to review case studies from New Zealand and summarise key points.

Key findings
The report identified key emerging themes:

- Managers and employees need to be aware of e-learning's benefits in order to be committed and participate.
- Effective use of Learning Management Systems allows businesses to meet their legislative requirements because of their ability to audit, track, and manage compliance related training.
- E-learning-related strategic plans must be positioned within the broader organisational training plans.
- Senior management support is critical to ensure that all the necessary resources are available to support the implementation of the e-learning solution.
- E-learning can more consistently deliver high quality training to employees regardless of their location or experience and allows them to revisit tasks until they have achieved competence.
- E-learning can improve the speed of the training or learning and reduce employee down-time.

The debates around the merits of e-learning for workplaces tend to focus on:

- Financial: The associated costs versus the necessary time and investment. Infrastructure costs for the ongoing development of the e-learning solution need to be identified.
- The e-learning materials need to be relevant and authentic and focused on organisational and workforce requirements.
- E-learning will be new so the benefits and impacts of its deployment need to be documented, published, and disseminated.
- Collaboration can reduce costs and increase the quality of the e-learning materials.

The major barriers to e-learning fall into one of three broad categories (the three Cs):

- connectivity (limited availability of the appropriate supporting ICT infrastructure)
- capability (the e-learning competence of the managers, employees, and trainers is unknown)
- content (many of the available materials are not relevant to the specific needs of the organisation).

Likewise the benefits of e-learning fall into one of three broad categories:

- Accessibility and flexibility (e-learning's ability to provide training to more employees irrespective of time and place to better meet individual employee needs).
- Consistency and scalability (ensure training is delivered in a timely and consistent manner and there is more comprehensive compliance with identified best practice or standards).

- Sustainability and cost-effectiveness (increasing productivity by reducing employee down-time and improving and increasing employees' basic knowledge which is a competitive advantage for organisations).

To ensure the quality of the e-learning experience a cyclical pattern is recommended (the five Ds):

- define (the training requirements)
- design (the training events)
- develop (the resources)
- deliver (the training)
- determine how or if e-learning can or should be used to meet the above requirements successfully.

Critical success factors for the implementation of e-learning fall into three broad categories:

- Organisational: Generic materials need to be developed in standardised ways for wide employee access and use. There needs to be a clear action plan for the implementation and support of e-learning initiatives which should be part of the organisation's key strategic initiatives.
- Training: although interactive materials are more expensive to produce, they are more engaging than their print-based counterparts. Deploying e-learning solutions via a Learning Management System allows the monitoring and evaluation of both the process and outcomes of e-learning use by employees.
- Learning: the lack of face-to-face interaction in e-learning and the effects this has on employee motivation needs to be acknowledged. There is a need to build confidence and competence in e-learning environments.

The specific critical success factors for **large enterprises** are:

- establishment of a diverse e-learning training and development team
- measurement of e-learning's effectiveness on the organisation and employees
- stakeholders are informed of e-learning's impacts on the organisation
- an e-learning coordinator is appointed to develop resources and facilitate delivery.

For **small and medium-sized enterprises** the critical success factors are:

- e-learning is embedded in normal training and education practices and events
- measurement of e-learning's impact and effectiveness
- the e-learning solution needs to meet their training and education requirements
- identification of how and when e-learning can be used in training and education plans
- recognition of e-learning's benefits in industry training and vocational education.

The report suggests a variation of the well established Kirkpatrick-Philips evaluation model be used by firms to measure the effectiveness and impact of their e-learning solutions:

- Return on investment: identify how the e-learning investment benefited the organisation and make recommendations for future training activities.
- Impact: measure how e-learning impacted on business results.
- Application: analyse over time how employees' on-the-job behaviour changed as a result of e-learning.
- Accomplishment: test if the employees have acquired the knowledge, skills, and attitudes that e-learning was intended to address.

E-learning for rail

Author: CRC for Rail Innovation

Reference number: 36

Year of publication: 2013

Introduction

The Australian rail industry varies widely in the degree to which its individual organisations use e-learning. A scoping study found that the Australian rail industry stood to realise substantial benefits if it took a more collaborative approach to the adoption and use of e-learning.

A project has been developed to further explore e-learning use and attitudes towards it by key stakeholders as well as developing e-learning resources specifically for use by the Australian rail industry. The project has also developed a checklist and key questions for organisations to use and consider when they are introducing e-learning as a training method.

Key findings

Success in e-learning is interpreted and evaluated differently by the various stakeholders. At a management level these evaluations focus on tangible outputs and cost savings, while users assess different factors.

It is important that rail organisations assess what purposes their Learning Management System will serve including which courses will be offered on it and how reporting will be undertaken. If e-learning is to be successful it must be accepted as a new training method.

Investigating e-learner satisfaction in the workplace

Authors: Daneshgar, F., Van Toorn, C., and Hsu., J.

Reference number: 39

Year of publication: 2010

Introduction
A literature review identified thirteen factors affecting learners' satisfaction in e-learning environments which formed the hypotheses for this study. These factors were grouped in broad categories:

- **learners** – computing attitude and anxiety as well as internet self-efficacy
- **instructor** – response timeliness and attitude toward e-learning
- **course** – flexibility and quality
- **technology** – quality of the e-learning system and internet access
- **course design** – perceived usefulness and ease of use
- **environment** – diversity in assessment and perceived interaction.

Methodology
A survey was the main data source which was informed and supported by a pilot study and structured interviews. The survey was sent to 275 individuals who were not specified and neither were the response rates.

Key findings
The quality and perceived usefulness of the e-learning course had a significant impact on learner satisfaction.

Learners' internet self-efficacy and the quality of the organisation's internet access and e-learning system might also impact on learner satisfaction.

Get ready for the future: Where is e-learning heading?

Author: Daunt, C.

Reference number: 41

Year of publication: 2008

Introduction
There are a variety of technologies that support e-collaboration, and these can be used to support real-time and/or delayed time interactions. Their common thread is that they enable collaboration between groups of people who are not physically in the same location.

Key findings
Instant messaging is seen by some organisations as frivolous, but it can provide timely and 'just-enough' responses to workplace queries without interrupting daily work flows and patterns. Being able to see who is available for communication is particularly useful for virtual teams because it gives them a sense of working together.

Video conferencing is a well established technology used by many organisations for collaboration. Newer functionality with improved picture quality and increased 'presence' of remote participants further enhances this value.

Skype combines the functionalities of video and audio conferencing as well as instant messaging at no cost to organisations. However, not all organisations allow Skype to be used.

Web conferencing has improved in recent years and is now a much more useful tool to support collaborative learning because of its ability to combine audio, video, presentation slides, and live interaction.

Twitter, one of the newer forms of social media, bridges the gap between real-time and delayed-time collaboration. While it is largely used for personal purposes it can support professional conversations and the exchange of relevant information and knowledge.

While weblogs (blogs) are typically not interactive, they are useful forums for publishing and disseminating thoughts and ideas.

Wikis are more interactive than blogs and allow shared working and interactions to occur asynchronously. However, it is important wikis are easy to navigate as complex ones can inhibit the learning process.

Facebook has yet to catch on as a training tool although some organisations allow its use for this purpose so that their employees can more readily share information and knowledge.

Ning appears to be the most suitable of the social media tools for supporting corporate e-learning because each user gets their own space where they can share information and knowledge (although this is not necessarily work related). Ning also provides a blog for each user and a discussion forum to facilitate collaborative learning.

E-learning in multicultural environments: An analysis of online flight attendant training

Authors: de Brito Neto, J. F., Smith, M-J., and Pedersen, D.

Reference number: 43

Date of publication: 2014

Introduction
Airlines have used e-learning for staff professional development because it minimises costs, delivers a consistent training experience to their dispersed workforces, is highly interactive, provides automatic feedback to learners, and automatically tracks their performance. However, e-learning decreased engagement for the airlines' culturally diverse learners. This was in part because of the associated instructional strategies and course design which basically transferred traditional delivery methods to multicultural e-learning environments and the fact that many of these learners could not use computers. And many airlines were unprepared for the introduction of e-learning.

In addition e-learning courses are not culturally sensitive and tend to reflect Anglo-American values (for example many were often only offered solely in English). The development of these courses was not done in consultation with learners and was predicated on speed, informality, reach, and quick responses which do not suit all learners.

Methodology
They used questionnaires and an online survey to collect the data and specialised software and analytical techniques to analyse it.

Key findings
Australian and New Zealand flight attendants had negative views about neutral e-learning environments while those from Canada, the UK, and the US did not. Non-English language learners were positive about the course relevance and learner motivation while English speaking learners had negative views. All respondents had similar views on the subject matter. The low engagement of all the learners was attributed to the lack of motivational strategies used in the e-learning courses.

All respondents were at best neutral, and at worst negative, in their perceptions about cultural aspects within e-learning. This was attributed to the respondents not having an opportunity to provide input prior to or during the courses which might have improved their cultural 'competence'. But the respondents viewed the course structure and navigation favourably and noted that it helped to facilitate their understanding of course content. This useful course structure also supported interactivity.

The authors noted that airlines could improve their e-learning by utilising a multicultural model of instructional design. This would alleviate the problems of prioritising assumptions that fast and informal technology could impart knowledge equally and consistently to all learners, developing learning platforms that are merely content repositories that reflect organisational cultural values, ignoring learner input, and adopting inappropriate pedagogical approaches.

Online vs. in-class success

Author: Freifeld, L.

Reference number: 48

Year of publication: 2014

Key findings

Fully online training is best for very large learner groups needing a consistent training approach, but should only be used for non-complex topics. Self-paced online learning can be used in most learning contexts, but traditional delivery is recommended for small learner groups where interpersonal interactions, team bonding, and non-verbal communication are required. Blended learning incorporates e-learning and traditional delivery and is the recommended approach for training that requires theoretical knowledge and its practical application.

It is critical that organisational training departments conduct a thorough needs analysis to determine the best delivery mode for their training. This analysis includes fully informing employees, managers, and other key stakeholders of the risks and benefits associated with each solution. The analysis should also note if learners have access to the necessary technologies and how capable they are of using them to support their learning. Technical support needs to be provided. Organisational IT departments should be consulted to identify the support they can provide for the selected technologies.

E-learning's effectiveness in improving job performance comes down to individuals. But it does allow learners to revisit courses for refresher purposes and to undertake learning at a time that best suits them. Compliance and software/technical skills training are best suited for e-learning.

Learners are more likely to participate in e-learning if they see its content as being relevant and the course is designed to support interactivity. Employees need orientation on how to access the supporting platform and use it effectively to support their learning. Shorter courses combined with gaming and more interactive approaches help increase learner engagement. Less text and more use of video, audio, and multimedia assists with increasing course interactivity. New authoring tools make this easier to achieve.

E-learning is likely to be successful where its content is appropriate for online delivery, the course is well designed, its relevance and usefulness are clear to learners, and supervisory support is available in the work environment. Subject matter experts should be consulted to assess if the content is appropriate for online delivery.

E-learning needs to align with an organisation's business goals and the specialised learning needs of its employees and not be implemented because it is the latest trend. E-learning can save money while maintaining the quality of training. Using the latest training technologies and platforms can save development time. This is important because e-learning courses take much longer to develop than traditional delivery ones. Organisations need a Learning Management System to track learner metrics which are critical to success.

When evaluating e-learning organisations need to examine learner engagement, completion rates, behaviour changes, expectations/goals achieved, cost, institutional knowledge retention, and lost on-the-job time. Direct employee feedback and aligning e-learning with an individual's overall performance, promotion, or attrition can help determine the programme's effectiveness when evaluated at an organisation-wide level, over time. Most importantly e-learning must provide the development of the employee's skill and competency that can then be transferred to their job.

Predictors of learner satisfaction and transfer of learning in a corporate online education program

Authors: Gunawardena, C. N., Linder-VanBerschot, J. A., LaPointe, D. K., and Rao, L.

Reference number: 54

Year of publication: 2010

Introduction
This study is based on an e-learning programme adopted by a multinational corporation to train employees in technical skills. The programme offered both undergraduate and postgraduate courses supported by a range of web-based technologies.

Methodology
Questionnaires and face-to-face and telephone interviews with the courses' instructors and instructional designers provided the study information. The study's participants were engineers, technicians, group leaders, and managers from the corporation's US and international sites. The sample size was 37 and all were qualified to degree-level or above, with experience in the company ranging from one to twenty-two years. Three different e-learning courses were surveyed. Most participants had taken one or two e-learning courses.

Key findings
To ensure a return on their investment, corporate e-learning programmes need to demonstrate that learners are transferring the skills obtained to their work environment. It is also important that learners have a good experience so they would be more likely to re-enrol in workplace e-learning courses.

The largest contributor to learner satisfaction was online self-efficacy[8] (63 percent) followed by course design (14 percent), learner-instructor interactions (7 percent), and learner-learner interactions (2 percent).

Extensive experience with the internet and computers in the workplace meant some learners did not complete the course orientation sessions. However, while they were knowledgeable about particular digital tools and technologies, they were not when it came to participating in an e-learning course which led to problems.

Contradictory results in whether learners were more satisfied with the course when it depended on the level of learner-learner interactions indicate that learners did not know how to effectively use interactions with peers to support their learning. This is also important because the largest predictor for successful learning transfer was collegial support (45 percent).

Organisational support was also important, with most learners feeling they had the resources that they needed to transfer their learning. But they needed more managerial support to facilitate the transfer. They also struggled to balance the training with their work requirements.

To succeed, organisations need to:
- connect e-learning with the corporation's strategic plan (to attract funding and support)
- engage a project manager who understands the technical components of e-learning
- enforce the attainment of course prerequisites to ensure all learners have the necessary pre-requisite skills to be successful in e-learning environments
- establish and 'market' clear course expectations
- consider language and culture during course design and development.

[8] Online self-efficacy refers to an individual's belief about whether or not they are capable of using technologies to support their learning.

Determining statistical significance between e-learning training versus traditional training in six different industry settings

Authors: Hairston, N., and Nafukho, F. M.

Reference number: 55

Year of publication: 2011

Methodology
262 workers from six industries (architectural, civil service, education, manufacturing, retail, and trucking) in the mid-western states of the US participated in the study. The workers were all entry- to mid-level supervisors ranging in age from 21-60, with the majority being males 35 years or younger. Most were experienced learners (but not experienced e-learners) with a large number holding degree-level qualifications.

They were split across either e-learning or traditional learning groups. The main data sources were a pre-training questionnaire and the pre- and post-test scores from the training modules.

Key findings
36 percent did not complete the training due to work conflicts, lack of time, or technology issues.

Visual learning was the preferred approach for most participants in the e-learning group and 46 percent in the traditional delivery group.

How they were taught made a difference for both groups, but this variation was larger for the e-learning trainees.

However, the growth in performance between the two groups was not statistically significant.

Competency-based training in SMEs: The role of e-learning and e-competence

Authors: Hamburg, I., and Engert, S.

Reference number: 56

Year of publication: 2007

Introduction

The ARIEL (Analysing and Reporting the Implementation of Electronic Learning) in Europe project investigated e-learning supply for developing small and medium-sized enterprises' (SMEs) competence, especially e-competence, to improve their work and to support their integration into the European market.

ARIEL has developed e-learning scenarios and will align with another EU project (SIMPEL) to provide, in cooperation with SMEs and SME consultants, sustainable models for the development of e-competence to support e-business and using e-learning and associated guidelines to implement these models.

Key findings

Many SMEs have few incentives to adopt e-learning. Reasons include workers unable to relate the e-learning to their work tasks; workers not allowed to take time out on the job for e-learning; or insufficient technical support.

Many of the problems associated with low uptake of e-learning by SMEs are based on:

- misconceptions and prejudices associated with e-learning where traditional delivery dominates training
- concerns about the high costs and overheads associated with the development and maintenance of e-learning
- lack of support by management
- lack of time off for staff to study
- no funds allocated by the company to support further training for staff
- lack of customised solutions to support SMEs business.

The critical factors of e-learning failure include: initial design issues, a focus on technology not instructional design, lack of understanding that e-learning needs to clearly link to existing competencies as well as the current and future work tasks of learners, lack of interactivity and non user-friendly environments, and problems with the production, distribution, long term management, and evaluation of e-learning courses.

While computer-based training is used to train workers, many courses are only text-based or PowerPoint presentations. SMEs need blended learning approaches where traditional delivery is combined with e-learning. The e-learning content needs to align with existing and required staff competencies to perform their work tasks and to the company's learning culture. E-learning also needs to be combined with informal learning methods to support the creation and sharing of knowledge.

Competency-based training (CBT) focuses on the gap between competencies already mastered and those desired. CBT supports e-competence and is closely related to the concept of 'competency management' and the development and use of e-portfolios and social software for employees.

Improving tacit knowledge transfer within SMEs through e-collaboration

Author: Harris, R. J.

Reference number: 59

Year of publication: 2009

Introduction
This study's small and medium-sized enterprises (SMEs) had to possess at least two of the following four characteristics: management of the firm is independent and typically the managers are owners, capital is supplied and the ownership held by an individual or small group, the area of operations is mainly local, and the relative size of the firm must be small.

Key findings
None of the respondents had undertaken any form of e-learning, although a large majority had websites, email capability, and internet connectivity and would consider e-learning if the quality and suitability of materials could be established. Many were unclear about what e-learning actually comprises (e.g. some thought CD-ROMs were distance education not e-learning).

There was a perception that e-learning could provide extra value to businesses, with the construction sector keen to incorporate a social dimension that would facilitate inter-organisational collaboration and knowledge transfer. The key areas of demand for e-learning were sales, languages, specific marketing input, e-business, finance/bookkeeping, legislative updates, and human resource development.

Respondents who worked in areas related to technology were generally more receptive to using e-learning for training and demonstrated heightened awareness of the necessary involvement and potential. However, several other respondents felt their e-learning potential was being hindered by an inability to effectively engage with office technology software and web-based technology, especially aspects of e-commerce and website maintenance.

Respondents generally expected the employee to undertake e-learning in their own time, especially for non-work-specific learning (e.g. language development). There was also concern about employee isolation in the use of e-learning.

Universities were preferred over commercial vendors for e-learning materials, due to distrust of commercial vendors (generic or irrelevant content, too much pressure to purchase their particular products and services, and limited after sales support, etc). Some concerns were noted about the potential for academic materials to be too advanced or impractical and the mixed results arising from current relationships with universities. The consensus among respondents was a preference for a blended learning approach centred on an e-learning portal, with a collaborative approach being favoured over stand-alone e-learning.

The SMEs had limited interest in formal qualifications and exhibited a strong preference for more informal types of learning, although some did not grasp what informal learning was. This informal learning needed to clearly link with improved capability and business performance, have strong buy-in from the respective learning partners, and have high-quality relevant e-learning materials and personal interventions.

While not all subjects can be effectively delivered by e-learning one of its great advantages is that it can cater for each learner's preferred learning style by providing multiple learning paths. The collective view of respondents towards e-learning was generally positive, but it was felt there was typically an overemphasis on the technology rather than a focus on business needs.

The addition of 'e' merely increases the range of available options to share tacit knowledge including online tutorials, bulletin boards and discussion groups, collaborative learning activities, and access to other content such as online procedure manuals.

Leveraging social learning to improve the compliance culture

Author: Hird, T.

Reference number: 62

Year of publication: 2012

Introduction
Compliance training, while important, is onerous for staff, the organisation, and trainers.

Key findings
Improvements can be made to the relevance of compliance training and its uptake by staff if more informal approaches are adopted.

Social media can assist with this because it gives more control to the staff.

This informal, technology-supported approach also allows for updates to compliance regulations to be promulgated in close to real time.

This also helps meet regulatory requirements through greater uptake and by increasing the efficiency and rate of knowledge absorption.

2010 e-learning benchmarking survey - final report

Author: I & J Management Services

Reference number: 65

Year of publication: 2010

Methodology
This survey had 800 employer respondents. The survey was based on 15 key indicators which were derived from the Flexible Advisory Group and subsequent developments of the Flexible Learning Framework[9]. These indicators were intended to measure the uptake and use of e-learning in Australia's vocational education and training system, and the impact of e-learning on providers and clients.

These indicators included the percentage of businesses offering e-learning opportunities to employees; e-learning as a percentage of all structured training provided by employers; and the number of industries investing in e-learning for long-term workforce development.

E-learning was defined here as: the use of 'electronic media to deliver flexible vocational education and training'.

Key findings
Employers are increasingly using e-learning in their provision of structured and unstructured training for employees. In this survey 50 percent of employer respondents were using e-learning approaches for their employee training (up from 40 percent in 2009).

The uptake of e-learning varies across industries. For example, 50 percent of employers in the education sector use e-learning to support their employee training compared to 40 percent in the retail sector and 30 percent in construction.

E-learning use on average is increasing over time. 60 percent of employers expect their use of e-learning to increase within two years of the survey (up from 49 percent in 2009). 85 percent of employers would encourage their employees to use e-learning if it was available (up from 81 percent in 2009).

If employers are engaged with the training system they are more aware of, and satisfied with, the e-learning services being offered by providers. Employer knowledge and expectations of e-learning are also increasing.

The 2009 survey report showed that employers 'valued a flexible learning experience, where the use of information and communication technology gave them control over where and when training took place'.

In 2010 most employers (88 percent) believed that e-learning increased access to training, provided flexible options for employees (85 percent), and was an efficient way for people to undertake training (75 percent).

[9] The Australian Federal Government's previous approach to e-learning in their vocational education and training sector

Web 2.0 social technologies in the workplace: Implications and opportunities for improving graduate employability skills

Author: James, R.

Reference number: 66

Year of publication: 2014

Introduction
This paper outlines results from major surveys on workplace e-learning from 2007 and 2009 to 2014 with an emphasis on Web 2.0 usage by both large firms and small and medium-sized enterprises (SMEs). The paper also identifies some perceived benefits and challenges associated with implementing Web 2.0 technologies.

Methodology
An internet desk top search was conducted from which the items from the first 10 pages of search results were selected.

Key findings
The available data indicates high actual and planned uptake of Web 2.0 technologies by workplaces. It also suggests that a greater range of technologies were being adopted by workplaces including more extensive use of web-based video technologies and social media tools especially Facebook and Twitter. Firms are using these tools and technologies for a range of purposes including intra-organisational communications, customer relations, and in some cases product development and recruitment. Similar uptake and uses were reported by New South Wales' government agencies

The survey results suggest that compared to developing counties particularly India, China, and Brazil Australia, Canada, the UK, and the US are less likely to adopt these technologies. Most companies had a dedicated social media strategy, but few respondents thought this was effective and social media was still not effectively integrated into firms. Superior performance in a Web 2.0 environment is predicated on early adoption of the technologies, a lack of internal barriers to their introduction, and an organisational culture that favours open collaboration.

SMEs typically used social media tools for their marketing efforts. But their adoption was less frequent than for larger organisations. And most SMEs were not using available tools and technologies to grow their business and did not have an appropriate supporting strategy. Similar findings applied to Australian local governments.

Benefits of adopting Web 2.0 tools and technologies include a reduction in operational costs, increased knowledge sharing, easier engagement with external experts, and increased skills and productivity as well as efficiency gains. But the clearest benefits were realised by firms that integrated Web 2.0 into their work flows so that collaborative working and information sharing become the norm and this can also allow for greater employee autonomy and decision making.

However, most firms did not evaluate their use of Web 2.0 tools and technologies properly so clearly establishing a return on investment was not occurring in the majority of companies surveyed. This was also the case for Australian local government.

It appears that concerns about security, productivity loss, privacy, and lack of time and skills to use Web 2.0 tools and technologies effectively are major barriers to their adoption in the workplace. However, employees think that they actually increase productivity and restrictive company policies and practices are hindering their full potential.

Tech trends

Author: Lawrence, R.

Reference number: 72

Year of publication: 2008

Introduction
The increasingly wide availability of the internet has seen an associated rise in workplace e-learning. But if e-learning is to be effective it must be driven by sound learning practices not technology.

Key findings
Technology can increase learner participation and engagement as well as developing higher order skills through its ability to support reflective practice. It also allows more of a partnership approach to be adopted between trainees and their instructors.

Blended approaches are preferred because they allow personal interactions to still occur. This also reflects learner preference for documents, manuals, and books to supplement virtual content.

The use of social media, especially Facebook, is increasing rapidly. Businesses are starting to use social media for various purposes ranging from locating knowledge within an organisation to supporting employee inductions. Social media can encourage trainees to use e-learning to collaborate and take greater control of their learning.

These media also better support informal learning. Embedding them within Learning Management Systems makes these systems easier to navigate. This embedding also ensures that social media is used for educational as well as social purposes.

The massive use of social media by employees, especially younger ones, means it cannot be ignored by corporate course developers. For example, at the time of writing, Facebook had 30,000 Microsoft employees as subscribers.

Blending learning for business impact: IBM's case for learning success

Authors: Lewis, N. J., and Orton, P. Z.

Reference number: 77

Year of publication: 2012

Introduction
IBM's new manager programme consists of three phases: 26 weeks of self-paced, online learning, an in-class five-day Learning Lab held at IBM learning centres globally, and 25 weeks of additional online learning where the content is more complex and focused on the application of skills and knowledge. By the end of the programme, each trainee has created an individual development plan and organisational action plan which are reviewed by their first-line manager.

Methodology
This programme was evaluated using the Kirkpatrick (1979, 1998) model on training impact. This used five different evaluation levels which were (in order): reaction, learning, transfer, business impact, and return on investment.

Key findings
There was high participant satisfaction with both content and modes of delivery. Over 96 percent of trainees showed improvement in their knowledge gain, with five times more content covered in the new year-long process than in the previous traditional delivery environment.

Significant behaviour change occurred as a direct result of training. Self-efficacy items also showed excellent results and self-reports on observable changes in leadership behaviour and impact on the business were uniformly positive.

Most easily measured was the cost-efficiency achieved using an e-learning approach compared to traditional delivery. IBM estimated the delivery return on investment as 17 to 1. Reuse of the e-learning methodology and using content object or simulation templates, was another source of savings.

Graduates were asked to assess the first-year annual impact, in dollar terms, which the leadership change (due to training) had on improving their departmental performance and outcomes. This led to a stated return on investment of 47 to 1.

However, learning preferences are poor predictors of e-learning acceptance for a number of reasons such as the compatibility of e-learning with existing tools and navigation. And usability is important to trainees. If trainees regard innovation as familiar, it increases their satisfaction with it and leads to its more rapid adoption.

And the simplicity of an e-learning application, as perceived by its target audience(s), will speed up its rate of adoption. Adoption is also assisted by appropriate orientation and how quickly the e-learning environment allows the acquisition of skills and capabilities.

An investigation of the enablers and barriers to industry uptake of e-learning: Small business case studies

Author: Mack Consulting Group

Reference number: 87

Year of publication: 2007

Introduction
All the case study businesses had broadband and high staff accessibility to computers. They also all had a strong learning culture where peer-peer learning was used in response to immediate business needs.

Key findings
Much of the training within these organisations is highly specific to their particular business context. Few of the organisations provide structured, formal training on a regular basis. The term e-learning is not one that is common amongst small business, and its use for structured training is rare.

Awareness and understanding of e-learning as a training solution is mixed – some business owners have experience of e-learning and are familiar with e-learning options while others have little or no understanding of this area. They were also unaware of the Flexible Learning Framework or the associated 'tool boxes' and learning object repository to support e-learning adoption and practice.

While all of these businesses routinely use the internet to research new products, technologies, product information or technical support for learning purposes, it is most often used to meet immediate and particular business needs. While most business owners/managers are open to the concept of e-learning they are concerned about its relevance to their business, its effectiveness in terms of improving business performance, and the cost of commercially produced learning materials. However, there is recognition that e-learning might become more relevant as the business grows and becomes more complex or geographically dispersed.

The preferred methods for increasing knowledge of e-learning and how it might suit their business is CD-ROM, particularly if it comes with the endorsement of the relevant professional body or industry association. Online forums are also useful sources for obtaining information and interacting with peers.

There is value in spending time with business owners/managers to explore training options, and to explain the concept of e-learning and how it might apply to their business.

The new breed of technical training

Authors: Mackie, J., and Uebel, T.

Reference number: 88

Year of publication: 2009

Introduction

Technical training is advancing and maturing, but as yet has not reached its full potential. This Australian case study organisation has successfully adopted a blended learning approach and achieved optimum learning outcomes.

This large financial institution introduced a new system that significantly affected the way both their customer-facing and back office staff operated. The training requirements for learning how to operate this new system, in combination with experience from previous system implementations, indicated that a new, interactive, and more engaging training approach was required.

Key findings

The overall approach adopted consisted of a pre-work online module, modularised facilitator-led workshops, and post-work exercises underpinned by self-paced learning.

The online pre-work module was used to introduce learners to the course and purpose of the new system. It took a case study approach to support participant engagement. A system simulation provided the case study in real time with interactivity.

Face-to-face workshops were set up according to the work and role of the participants. The key foci of the workshops were: developing soft skills, continuing the online case study, completing work-based scenarios using the new system, system demonstrations and rehearsals, and best practice tips.

Ongoing support was provided in the form of post-work (print-based) exercises and participant workbooks. These workbooks supported ongoing self-paced learning by taking into account employees who did not have English as a first language (and their varied computer literacy skills) as well as an ability to target the training to the needs of this audience group.

Corporate sector practice informs online workforce training for Australian government agencies: Towards effective educational-learning systems design

Authors: McKay, E., and Vilela, C.

Reference number: 89

Year of publication: 2011

Key findings

Corporate sector research is more likely to identify barriers to online training than government agencies. The corporate sector also maintains a more open, transparent attitude to their online learning practices. They typically adopt a four-stage e-learning planning process: planning, building, integration, and improvement.

Two major benefits associated with e-learning noted by employers are cost savings and the ability to develop their employees into self-directed lifelong learners. Facilitating e-learning for adult learners requires specialist skills and innovative practices.

The content and design of e-learning materials needs to challenge and interest all learners to avoid de-motivation for novices or experienced learners. Better designed interfaces and improving their understanding of technology would assist older workers overcome the technical problems they encounter with e-learning. The private sector is better at understanding the learning needs of their employees and developing relevant learning materials than the government sector.

The design of learning materials needs to consider the growing complexity of tasks, the growing reliance on collaboration, the growth of e-learning, the increasing power of performance support systems, and the emergence of personal tutorial systems.

Barriers to adopting e-learning fall in two broad categories:

- organisational - costs, relevance, training effectiveness, and technical support
- employee - training effectiveness, sufficient time to undertake the training, reliability of the learning tools, technical abilities of the learner, and the relevance of the content.

The cost to develop materials and purchase/maintain the required infrastructure is especially an issue for small and medium-sized enterprises. Large organisations recognise the value of e-learning and costs are considered in light of their return on investment, rather than as a specific barrier.

It is important that firms understand the benefits to be gained from e-learning and see them as being relevant to their business needs. Many commercial solutions are designed to support traditional delivery rather than e-learning, and it can be difficult to separate marketing hype from relevant solutions Organisations need to measure training and course effectiveness.

To be successful organisations need to have a thorough understanding of e-learning and at least reduce, if not eliminate, the barriers outlined above. There is no clear evidence demonstrating which strategies are most effective to support e-learning in diverse government agency contexts.

The ‘e’ in e-learning refers to how a course is delivered electronically while the ‘learning’ refers to what the course content involves. The authors argue that poorly designed e-learning courses render the whole learning experience ineffective and delay their widespread implementation in the government and corporate sectors. A well designed e-learning course involves the creation of a learner-centred, flexible and adaptive programme that integrates the potential of information and communication technology multimedia tools.

Symbolic meanings and e-learning in the workplace: The case of an intranet-based training tool

Author: Michalski, M. P.

Reference number: 91

Year of publication: 2014

Introduction
While corporate e-learning research has expanded its areas of focus and interest it is still criticised for its bias towards the functional and technical aspects of e-learning. This article focuses on one of these underdeveloped research areas: the learning context in which corporate e-learning occurs.

Methodology
This article's data is derived from 15 semi-structured interviews conducted with a range of staff from QA Experts, a multinational consultancy firm (including offices in the UK) that provides asset management services. The common focus of the interviews was the interviewees' perceptions of their work experience. Appropriate and relevant company documentation was also used.

Part of their training programme is delivered via an intranet-based tool (referred to as the SDS) with modules completed on a self-paced basis and progression dependent on each individual's exposure to on-the-job responsibilities. This system is supported by a cluster of documents and procedures, such as induction sessions, organisational 'tool kits', and initial expertise assessment procedures.

Key findings
The design of an e-learning course should include learners' prior knowledge and qualifications, their personal and social characteristics, preferred learning styles, internal motivation, and readiness for learning.

The respondents saw benefit in the ability of the SDS to standardise best practice and organisational knowledge, but preferred traditional delivery because they thought it was a superior form of learning.

In the respondents' view the SDS was not regularly updated or refreshed, did not fairly reflect the organisation's knowledge, did not play a role in project work or on-the-job learning, did not capture new practice-delivered knowledge, and was not well supported by the company's leadership

For younger staff, the SDS was a valuable tool in the transition from novice to expert, and allowed them to interact on a more equal basis with their senior colleagues. Completing the SDS training programme for younger staff was also a good way to demonstrate their enthusiasm and commitment to the company and their own professional development.

The SDS was originally envisaged as a basic training, accreditation, and competency-building tool for young graduates' professional development and as a means to convey experts and colleagues knowledge, but has since been used to cover a wide range of functions with mixed results. Changing organisational culture and structures has weakened the legitimacy of the SDS and ultimately its ability to effectively engage and enrol a critical mass of professionals.

This case study illustrates the need for a clear focus for workplace e-learning tools and the need to link them to actual work and ensure that they provide support for real work problems.

E-learning can support learning through doing if it is well integrated into a wider system for individual and organisational development.

Combining formal non-formal and informal learning for workforce skill development

Author: Misko, J.

Reference number: 93

Year of publication: 2008

Introduction
The introduction of e-learning and its associated technologies has affected the way work gets done in a majority of new and traditional industries. For example, in a number of sectors including agrifood, manufacturing, services, and transport, technology has changed the way firms manage their inventory and supply chains.

These advances have also changed the way organisations share knowledge internally and externally and have supported the introduction of e-business as a way for governments and corporations to interact with customers.

Key findings
There is an increased need for workers, especially those whose everyday work requires high-frequency interaction with these technologies, to continually add to, and update their, skills and knowledge.

E-learning has enabled organisations to combine formal, non-formal, and informal learning approaches in new ways, including new communication channels between different departments and levels of employees (e.g. email, chat rooms, discussion forums, and interactive websites).

E-learning allows workers to undertake learning at times and locations that suit their professional and personal obligations and commitments.

E-learning as part of a blended approach allows organisations who operate in highly regulated environments to ensure that all their employees remain compliant with legislation. Whether e-learning is stand-alone or used as part of a blended approach it requires:

- easy access to computers, the internet, email, and technical support personnel
- minimal time in starting the computers and downloading information
- timely feedback from trainers
- employees having adequate language and literacy skills
- the material also needs to remain compliant with specific standards, and remain current, relevant, and engaging.

Effective implementation of e-learning: A case study of the Australian Army

Authors: Newton, D., and Ellis, A.

Reference number: 100

Year of publication: 2005

Introduction
Bonk and Wisher's 2000 study of the US Army highlighted the inherent difficulties in transferring e-learning related experiences and knowledge from one context to another. The Australian Army has used e-learning since 1987 and has had high level support since 1996 when it became part of their regular training content.

More recent e-learning developments have ensured conformance to external standards (specifically the Shared Content Object Reference Model or SCORM and Aviation Industry CBT Committee Standards).

Methodology
In the absence of previous research in this area the authors collected data and then developed the study's hypothesis. They then adopted a structured interview process with senior army personnel responsible for implementing e-learning to refine the information collected.

Key findings
E-learning needs to take into account an organisation's culture and align with organisational structures and priorities as well as learners' needs.

Centralising e-learning initiatives with greater senior management support was driven initially by the desire to reduce training costs (e.g. accommodation, travel, ammunition). A technology training centre provided specialised staff to develop e-learning materials. Regional training centre were created to assist larger group trainings. They also adopted simulations with supporting strategies and policies.

Courses selected for e-learning development were based on a broad range of criteria including: content (which had to be largely information-based), opportunities to reduce operating costs, and requirements to train large numbers of staff. These courses included regular refresher training for all personnel such as first aid, core courses for promotion, and legislated courses.

Instructors expressed concerns about a change in role from 'leader' to facilitator and there were also concerns raised about the proportion of practical training being delivered by e-learning. Blended training delivery (which combines traditional and e-learning delivery methods) has been used alongside trainee support provided by technical specialists and instructors.

An orientation session held on the day prior to classes to explain how to use and navigate the e-learning packages, with support from peers (as well as the instructor and technical staff) is useful.

There were also concerns that a shift to web-based training (not in use at the time of writing) could lead to an overemphasis on text which would not suit trainees with low literacy (which many have based on their own and the UK and US Army experiences).

The Technology Training Centre conducts evaluations of its e-learning through pre-delivery testing and post course questionnaires and forums. These evaluations support continued e-learning development with outcomes comparable to their traditional delivery counterparts.

User satisfaction has been positive, especially with the self-paced learning and multimedia features.

Learning paradigms in workplace e-learning research

Authors: Norén Creutz, I., and Wiklund, M.

Reference number: 101

Year of publication: 2014

Introduction
The uptake of e-learning in the workplace and the associated research has rapidly increased since 2004. E-learning is seen as having much potential to support lifelong learning and meeting the requirements of knowledge oriented (and increasingly globalised) workplaces. The increased use of e-learning mirrors the shift in work from physical to non-physical products. E-learning also allows workplace learning and training to occur as and when needed.

Methodology
36 peer-reviewed English language articles were included in this literature review.

Key findings
The authors used the metaphors of celebration, questioning, reflection, and dissolution to categorise and analyse the selected articles. There is a need for comprehensive overviews of workplace e-learning literature. But one of the factors complicating these overviews is that many different disciplines are involved including education, psychology, computer science, and human resource management. Each of these has a different perspective and idea on how to conceptualise and present workplace e-learning research. The common thread between the categories is they do not focus on learning and do not clearly define what this is or position it as a marginal issue in relation to the specific area being studied.

The celebration category focuses on the benefits accrued through workplace e-learning which are defined broadly as flexibility, cost, and breadth of coverage. Any disadvantages are largely ignored. In this category e-learning is viewed as being both better and more efficient.

The questioning category in contrast takes a sceptical stance towards workplace e-learning. However, this is not a critique of workplace e-learning's associated technologies. Articles within this category mainly focus on usability, technical failure, employee attitudes, and how to improve workplace e-learning in varied organisational contexts. They highlight the numerous failures of workplace e-learning implementations and foresee the importance of employee motivation to participate in successful e-learning programmes. The underlying assumption is that workplace e-learning can be improved through increased employee motivation and better technical infrastructure.

The reflection category is predominantly interested in the pedagogical and organisational issues that need to be addressed if workplace e-learning is to be successful. These researchers focus on learning behaviour. The posited solution for workplace e-learning in this category is to adopt socio-cultural perspectives on learning that examine the relationships between people and the technical infrastructure.

The dissolution category notes the emerging importance of mobile learning (m-learning) because it supports the co-construction of knowledge particularly between novices and experts. M-learning is different to e-learning because it supports learning that recognises the context and history of each individual learner and delivers learning to the learner whenever and wherever they want it.

A recent term highlighted in this category is ubiquitous computing where ICT becomes so commonplace that it merely becomes another supporting mechanism for day-to-day tasks rather than being viewed separately. This takes flexibility a step further by saying that learning on anything can be done by anyone and posits lifelong learning as a perpetual learning opportunity rather than it occurring at discrete and infrequent stages. Dissolution in this context refers to the possibility of learning and knowledge being removed from the constraints of time and place.

The evolution of e-learning: Are we there yet?

Author: Nott, G.

Reference number: 102

Year of publication: 2008

Introduction
This article is based on an interview with Skill Soft's Vice President (whio is also Managing Director of the Asia-Pacific region). SkillSoft is one of the largest global workplace e-learning vendors.

Key findings
While the technology and infrastructure have matured so too has instructional design so that courseware better meets users' needs. It is now widely accepted that e-learning is an effective and cost-efficient way of enabling learning. There has also been a realisation that blended approaches are better and a move away from the view that e-learning would replace traditional delivery.

A shift in emphasis from courses to content means content is available to employees as and when needed. Access to this content and how it is presented has also improved. This is important because people want access to information that is just-enough, just-in-time, and just-for-me.

Companies like Telstra and St George Bank are changing how they enable learning, for example by supporting their e-learning efforts with complementary initiatives such as the development of information resources and performance support tools. This approach is based on a realisation that learning is more effective when people can access it in small 'chunks', reflect on it, and then apply it immediately.

To be effective, the e-learning environment has to be used regularly, so that employees can reinforce what they have learned and are motivated to discover more. Younger employees expect similar functionality and interactivity from corporate learning environments as they get from their personal technologies and devices. Incorporating video and gaming technologies into corporate learning could more effectively engage younger employees. E-learning can also support better knowledge transfer from more expert or experienced employees to less knowledgeable workers.

While companies may utilise vendors' infrastructure they are increasingly creating their own e-learning content.

The use of e-learning in the workplace: A systematic literature review

Authors: Nunes, M., McPherson, M., Annansingh, F., Bashir, I., and Patterson, D.

Reference number: 103

Year of publication: 2009

Introduction
There is a large diversity in the uptake and maximisation of e-learning in different workplace settings, and challenging decisions have to be made in relation to the hardware and software to deploy.

Key findings
Larger companies are more likely to develop their e-learning material in-house to align to their learning needs and gain competitive advantage. They note improved business processes and better relationships with business partners as a result of their e-learning efforts.

Small and medium-sized enterprises (SMEs) are less committed to e-learning and tend to outsource it or purchase off-the-shelf solutions because of scarcity of funding.

Large companies adopt e-learning as a result of strategic planning and staff aspirations, whereas SMEs use e-learning on a tactical level and typically only train their employees when absolutely necessary.

Wide use of e-learning across both business functions and general organisational learning and knowledge has resulted in holistic learning solutions, such as organisational learning portals, communities of practice, and weblogs (blogs).

While there are instances of mobile learning, wikis, podcasts, and multimedia, workplace e-learning is still predominantly offered through sequential courseware.

Most workplace e-learning focuses on formal learning. Informal approaches can be supported by virtual communities of practice and personal and organisational blogs.

There is no consensus in the literature regarding the effectiveness of workplace e-learning. While improvements in individual performance and job satisfaction are easy to measure, the impacts on overall business performance are not.

Challenges associated with e-learning for employees include learning being additional to existing workloads, a lack of opportunities to interact with peers and experts, and a lack of personalisation or relevance to work roles.

Constructive ways of measuring e-learning evaluate the advantages arising from reduced travel time, better staff access to company information and product knowledge, the higher quality of training, and more opportunities for off-the-job training.

Performance and talent management systems are also using emerging technologies to help organisations link learning with performance.

Successful e-learning strategies are closely aligned with organisational strategic and operational planning. Introducing e-learning also generally means adopting a new organisational learning culture.

Organisations need to ensure staff have the basic low-level skills such as being able to use computer-mediated technology, online ‘etiquette’, and web navigation and searching before implementing more complex solutions.

Trading places with interfaces: An investigation into online training for the travel agency sector within the United Kingdom

Author: O'Donnell, D.

Reference number: 104

Year of publication: 2012

Introduction
The travel and tourism sector has a long history of using technology to support their strategic and operational plans. Consumers are also using new information media, including the internet, to gain knowledge and increase their choices. New Zealand travel industry training is managed in part through e-learning by Tourism New Zealand, with constant updates to ensure the ongoing relevance of the programme.

Methodology
The study used data captured through an online questionnaire and telephone interviews. The study's population was 21 UK travel agents who had completed the ten training modules on the Tourism New Zealand online training website. Most of the participants were female and relatively inexperienced front line staff.

Key findings
Most of the participants found accessing the training straightforward and that their computer skill levels were adequate or excellent. A small number of those who encountered login and software compatibility problems withdrew from the course.

Most of the time allocated for e-learning was at the beginning or end of the day and consisted of informal training sessions where the employees worked through the modules at their own pace. There was a mixed response to this allocated timing of training.

The findings support a scaffolding approach where small learning components are gradually built on, but are still able to be used in a variety of ways to suit individual needs. This does make web design challenging, and is why many organisations outsource their e-learning course design elements to private specialist organisations.

According to Tourism New Zealand each module would take about three hours to complete. But most of the study participants completed them in about 30 minutes. The participant responses indicate that only surface learning was used (e.g. through multiple repetitions of tests) as well as social learning where peers answered each other's queries. Younger learners and those who felt highly engaged with the training were more likely to complete quickly than their older counterparts.

The content was generally seen as being relevant to job roles and performance, with most respondents feeling their personal confidence and ability to sell New Zealand as a destination and Māori cultural knowledge had increased. Key factors in these higher motivation levels were expectations of monetary rewards from increased knowledge, greater future sales, and personal promotions.

Participants wanted greater use made of multimedia, especially the integration of movie clips, and increased opportunities for collaboration. The ability to repeat tests and other course components not only increased motivation but also allowed almost all participants to recover quickly from any mistakes they made.

Tourism New Zealand have invested heavily in their e-learning programme using external web designers for its technological components supported by in-house experts to provide knowledge and understanding of New Zealand as a destination.

Video-driven multimedia, web-based training in the corporate sector: Pedagogical equivalence and component effectiveness

Author: Pang, K.

Reference number: 107

Year of publication: 2009

Introduction
This study used the novice-to-expert analysis approach to training design. Expert knowledge is used to assess novice knowledge and guide novices towards knowledge gain, with material provided prior to the learning for initial familiarisation.

Methodology
This study included 38 participants with a range of ages, educational qualifications, work experience, and positions within the organisation. Participants were randomly assigned to an experimental (e-learning) group and a control (traditional delivery) group, each of which had different instructors. The outcomes were measured by two questionnaires; one focusing on participants' internet and computer experience and the second assessing the effectiveness of the learning.

Key findings
No statistical difference existed between the two groups in their computer and internet experience. The only clear difference was the e-learning participants being better at assigning traits and characteristics to a leadership or management function than their traditional delivery counterparts.

The e-learning group knowledge gains appear to be driven by the videos, handouts, and interactivity (which participants noted enhanced their knowledge of the content). In addition the multimedia component appeared to facilitate their learning.

These findings suggest that e-learning may be a better alternative for workplace training because it delivers a similar level of knowledge gains more cost-effectively.

Factors associated with transfer of training in workplace e-learning

Authors: Park, J.-H., and Wentling, T.

Reference number: 108

Year of publication: 2007

Introduction
To prove e-learning's effectiveness many organisational training personnel and managers, as well as academic researchers, have focused their efforts on transfer of training which is defined as the degree to which individuals effectively apply the skills and knowledge gained from a training programme to a job situation.

Methodology
This study relied on data from four online survey questionnaires - one measured learners' attitudes towards computers at the beginning of each course and another measured learners' perceptions of system usability immediately after course completion. The final two measured the transfer of training six months later for both the learners and their supervisors respectively.

There were 47 learners at a multinational agriculture and construction company headquartered in the US who took either a 'hard' or 'soft' skills course. Learners in the soft-skill course had higher educational qualifications than their counterparts in the hard-skill course. Most of the learners were male and the largest number was doing the course because it related to their job.

Key findings
Supervisors had higher levels of overall training than learners. But the perceptions of course difficulty were similar between the two groups.

Confidence in using computers was the single most important factor in explaining the variances in training transfer between trainees.

Usability of the e-learning systems was the most critical factor in learner satisfaction (e.g. easy to become familiar with and the associated instructions were clear). Satisfied learners tend to have higher completion rates. Users' attitudes towards computers are a component of usability satisfaction. If learners are not comfortable with computers then a pre-training intervention to enhance learners' confidence and self-efficacy levels is recommended.

Evaluation of ‘hearing voices’

Author: Pearson, A.

Reference number: 110

Year of publication: 2012

Introduction
Hearing distressing voices is a major problem for mental health patients and workers alike.

The Hearing Voices project allows mental health workers to experience hearing distressing voices via a simulation. The blended training approach included a lecture, listening to an audio simulation and undertaking an activity typical for a mental health patient (e.g. attending treatment) while listening to the audio simulation.

The programme was delivered to both New Zealand and Australian mental health workers.

Methodology
New Zealand and Australian mental health workers who had attended the training within the previous two years were surveyed. Four focus groups were held and four people were interviewed including a workplace manager, a training manager, and tertiary training leaders. Most of the survey respondents were female, from Australia, and European/Pakeha.

Key findings
Despite the blended approach, the e-learning aspect was seen as the most relevant. The large majority of respondents agreed that it was useful to talk in more detail with mental health patients who hear voices to gain a better understanding of their issues. The simulations allowed the participants to experience in a much more realistic way what their patients are going through.

Cost was a barrier to access because employers could not afford to have all their staff undergo this type of intensive, blended training. This type of training approach may also be useful for organisations that regularly interact with people because it helps increase the empathy of staff towards those who they are dealing with.

Possible improvements include having the audio recording available in different languages e.g. Chinese, Samoan, or Māori, and further incorporating mental health patients views.

Case study: The evolution of the business case for e-learning at St George bank

Authors: Pitt, C. and Heys, A.

Reference number: 112

Year of publication: 2009

Introduction
St George Bank is Australia's fifth largest bank and is well regarded for the extent and quality of its e-learning initiatives. E-learning is now seen as being essential to its business success. This article examines St George's e-learning journey over a decade or so.

Key findings
Positioning e-learning within their leadership development programme rather than as a separate platform made it highly business-relevant. Implementing internal 'marketing' activities to promote e-learning in order to gain the support of the wider workforce is essential and this needs to be strongly supported by management who also need to ensure that e-learning is actually completed.

The benefit of implementing e-learning includes:

- increased employee satisfaction and retention because of wider access to learning opportunities
- greater innovation and sales
- minimal productivity losses because of reduced face-to-face training and the associated travel
- learning on-the-job
- less duplication of materials
- more streamlined training
- a consistent learning approach
- rapid documentation of learning outcomes.

E-learning also supports a shift from a product-centric approach to a customer-centric one and it assists with the development of core competencies giving St George competitive advantages.

E-learning's costs include large expenses associated with materials development, mixed or uncertain learning outcomes, high attrition rates, and the potential technology problems and barriers associated with creating and using an e-learning solution. These issues can be compounded by instructor and employee preferences for traditional delivery, which, if not actively addressed can lead to programme failure.

Organisation-wide and external recognition of e-learning efforts helps foster commitment. Readiness assessments should include: learner readiness and capability, the speed of execution, convenience (e.g. as measured by lost productivity and resource time), and ongoing ease of maintaining knowledge, learning, and capability. One of the guiding principles of St George's e-learning efforts is that e-learning is only adopted where it makes developmental, commercial, and business sense.

Removing employee choice around how information could be accessed helped overcome their bias against e-learning. Requiring e-learning to be a component of all new courses helped overcome instructor bias against e-learning. While these requirements were controversial, over time widespread commitment to e-learning emerged and St George's learning culture was transformed.

Training content is embedded in day-to-day work at St George using the associated technologies. Knowledge is now readily available from a number of internal and external

sources. E-learning allowed external stakeholders to participate in compliance training, for example allowing car loan financial advisors to meet their licensing requirements.

E-learning also improves training transfer because formal learning is reinforced as employees undertake their job tasks. And e-learning allows managers to manage staff performance more effectively as well as being able to identify gaps for further development.

Learning and development professionals need to shift from being the transmitters and imparters of information to the custodians or guardians of assessment and monitoring as well as advising learners on the business relevance of the content and learning.

St George regularly collected data and where necessary, took corrective measures. For example, data showed that completion rates for externally sourced content were poor, so the modules were condensed into shorter sections to improve completion rates. Effectively measuring and evaluating learner satisfaction, perceptions, and attitudes are also crucial.

E-learning is now driven by St George's staff. Employees choose the way, time, and place of their learning with St George supplying the necessary tools and infrastructure, and empowering the trainees to embed learning into their current business context. St George is recognised as being a leading e-learning organisation in part because they do not adopt a one-size-fits-all approach.

Acceptance and resistance to corporate e-learning: A case from the retail sector

Authors: Rabak, L., and Cleveland-Innes, M.

Reference number: 113

Year of publication: 2006

Introduction
Lifelong learning is now a reality for the Canadian workforce and employers are increasingly adopting e-learning approaches to support it. Much current research supports the efficacy of workplace e-learning as a way to educate and train people while at the same time reducing costs, improving the consistency and speed of learning, tailoring training to specific individual needs, and increasing productivity more rapidly. Workplace e-learning typically has higher levels of interactivity and is self-paced which can deliver better results

Methodology
Interviews and self-administered questionnaires were used to examine the factors affecting learner interest in, and resistance to, e-learning. Survey respondents included both those who had participated in e-learning and individuals who had not. The interviews were conducted with 10 participants. Participation was measured by whether the employee had completed the first 16 of 30 prescribed e-learning modules. Various monetary and non-monetary incentives to participate were provided including the use of employee recognition posting.

Key Findings
While the e-learning was generally favourably received by respondents, there were some who did not participate. The main reason for this appears to be a lack of literacy, technical, or other necessary skills. In addition concerns were raised about tying e-learning participation to performance reviews with this practice being viewed negatively by respondents. And participation costs including computer use and internet access were borne by the employees rather than their employers.

There were also complaints that insufficient time was allocated to complete the e-learning. Other problems noted included a lack of incentives to participate, insufficient support and coaching, inadequate infrastructure, and no practical assessment of e-learning in the actual work environment.

Overall attitudes towards workplace e-learning were positive with the materials perceived as being easy to understand, the knowledge gained enabling the job to be done better, and people being confident in their ability to learn on their own.

The main benefits recognised by employees were improved customer service and product knowledge. Nearly three-quarters of the study's employees agreed that it was important or very important to receive rewards and recognition for participating in e-learning training.

The following recommendations were made:
- Staff should be scheduled to take e-learning during working shifts on a regular basis. For home-based learners clear expectations need to be developed for a minimum acceptable standard for completion of lessons.
- Train the trainers so they can effectively implement the e-learning solution and are able to resolve technical problems.
- The line managers need to assess the day-to-day application of the e-learning by staff and act as mentors when required to ensure that the lessons are being applied. Managers must be strongly involved in the e-learning training as participants because this demonstrates the importance of e-learning and facilitates its adoption into the corporate culture.
- E-learning lessons should be regularly updated to encourage future participation by the employees already engaged.

Beyond e-learning: Approaches and technologies to enhance organizational knowledge, learning, and performance

Author: Rosenberg, M. J.

Reference number: 120

Year of publication: 2005

Introduction
There are five fundamental realities which are changing how organisations should approach e-learning to support their training and performance:

- Technology-based learning can now be regarded as a permanent feature of workplace learning.
- However, traditional delivery is still required because of the additional and different interactions it provides.
- While e-learning may be a permanent part of workforce training, it still needs to be justified as adding value for the organisation.
- Training is occurring in a much wider range of locations than work or a classroom.
- Organisations are increasingly operating in a '24/7' environment.

Key findings
Some critical lessons relating to e-learning have emerged which can be used to improve its performance. These include an overreliance on technology and viewing e-learning as the objective rather than as a means to achieve particular goals and outcomes. And e-learning is harder to implement than expected, it does not replace strategy, and it can only be used to deliver certain types of content.

To succeed, organisations need to have an overall training strategy, focus on business and performance requirements, increase e-learning expertise, pay attention to the unique aspects of e-learning course design, and consider what would constitute relevant assessment, focus on informal learning, have strong governance and sponsorship by decision makers, and effectively manage change.

Organisations should also adopt a 'smart enterprise' framework consisting of:

- Learning and performance architecture – this integrates e-learning and traditional delivery, and formal and informal learning. Its underlying assumptions include most learning takes place on the job, learning and training are different, and online training is only one of a number of solutions, but technology can improve learning while workforce performance is the ultimate value proposition.
- Change management and communications – its critical success factors include early involvement of decision-makers and key stakeholders, publicising success, focusing on early and 'second-wave' adopters, establishing incentives, constructing a solid value proposition and attainable benefits, establishing priorities, dispelling fear of technology, giving people time to adapt, and providing ongoing support.
- Learning leadership.
- The performance environment.

Meeting the training needs of SMEs: Is e-learning a solution?

Authors: Roy, A., and Raymond, L.

Reference number: 121

Year of publication: 2008

Methodology
The authors defined a small enterprise as having 20 to 99 employees and a medium-sized one as having 100 to 499 employees. Case studies of 16 representative small and medium-sized enterprises (SMEs) in terms of their industry and size with at least 10 years business experience from the Canadian provinces/states/territories of. New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland were carried out.

Semi-structured interviews were conducted with owner-managers, training managers, and a small number of employees. The SMEs were placed in one of four profiles depending on their awareness and use of e-learning:

- none
- weak (e-learning typically instigated by individual employees)
- average (SME had at least two e-learning courses)
- strong (those who used it regularly).

Key findings
The 'strong' SMEs were medium-sized with an average of 300 to 489 employees. They conducted more formalised and rigorous analyses of their training needs and adopted more sophisticated tools and systems (such as Learning Management Systems). They identify their training needs earlier and align these with their strategic objectives.

'Average' SMEs were the smallest with 60 to 280 employees. They use a range of tools to assess their training needs.

'Weak' SMEs were also all medium-sized with an average of 150 to 350 employees. Employees instigate e-learning because they perceive benefits in doing so, especially because it allows them to balance training with their work and other commitments.

The 'non-existent' SMEs had the greatest range of employees with an average of 75 to 400. They use performance evaluation to assess their training needs (i.e. can the employee do the required task).

SMEs can access training products and services via e-learning that would otherwise be unavailable. E-learning also allows them to develop their own courses or do so in partnership with others. This means that the materials can be much more company-specific.

For e-learning to be successfully introduced in SMEs there needs to be a supportive organisational culture where employees and managers alike are truly committed and motivated to use e-learning because they believe it is essential to their own and the organisation's development, and employees need to have computer knowledge and skills as well as access to software that is user-friendly and appropriate to the task at hand.

Using e-resources and tools to update professional knowledge in the workplace

Author: Shanahan, M.

Reference number: 128

Year of publication: 2009

Introduction
Mandatory continuous professional development has been recently introduced for health workers who must keep abreast of rapid advances in scientific knowledge and technology. To manage these requirements health workers must have access to the information resources that contain the knowledge base of their profession.

Methodology
This study was based on a survey sent to about 1,000 Australian Medical Imaging Workers (MIW). They had a response rate of 31.1 percent and analysed the results using specialist software and descriptive and inferential statistics.

Key findings
Electronic resources and tools for updating professional knowledge and communications are important. Video conferencing and listservs were seen as less useful for communications, while email was the most commonly used tool. The internet, specialist online databases and journals were all widely used to access information and knowledge.

Workplaces need to ensure that all areas and work environments, regardless of specialisation, have access to all the necessary electronic resources and tools, taking into account any sector and government online network restrictions. Organisational culture and workloads are also important contributory factors in determining access to these electronic tools and resources.

The internet is important because it offers immediate access to the most current health and medical information which includes online journals, relevant databases, practice guidelines as well as information on professional development activities. The internet also supports communications with national and international colleagues through email, listservs, and video conferencing.

A critical evaluation of the contribution of trust to effective technology enhanced learning in the workplace: A literature review

Author: Short, H.

Reference number: 129

Year of publication: 2014

Introduction
Establishing trust between participants is important in virtual learning environments. But this is challenging because a lack of face-to-face interactions reduces trust between participants. The costs savings which e-learning can achieve are even more critical in the current economic climate. The availability of the associated technologies and decreases in their costs also make e-learning increasingly attractive for firms. But uptake remains low and this could be due to users' perceptions.

Key findings
Trust is important because without it ideas and information are unlikely to be shared. And trust is also a prerequisite as technology alone is insufficient to make these environments work. Establishing trust between participants requires building a more learner-centred learning environment.

Leadership style and organisational culture are also important in establishing trust in virtual learning environments. It is also recommended that there are face-to-face meetings between trainees and instructors prior to the online course starting.

However, the lack of communication and non-verbal cues hinders the establishment of trust in virtual learning environments. Feelings of isolation are more difficult to overcome in virtual learning environments because of the lack of informal and chance interactions with colleagues. A lack of time and technological problems also hinder the establishment of trust in virtual learning environments.

Instructors play an important role by facilitating and supporting social interactions between trainees and establishing an open and trusting teaching approach such as communicating often and openly, being honest, and being consistent and predictable.

Alternatively virtual teams can include people who have worked together previously as the basis for establishing trust. Team approaches where successes and failures are shared are also useful in this context.

The overall consensus of the relevant research literature is that increased interactions between trainees lead to improved learning outcomes although some individual case studies dispute this. One of the problems in virtual learning environments is that they focus on information exchange at the expense of participation. A lack of participation can be offset somewhat by e-learning because it allows for more personalised learning.

E-learning and earning: The impact of lifelong e-learning on organisational development

Author: Simmons, J.

Reference number: 131

Year of publication: 2006

Introduction
Many of the skills required for the modern economy can be achieved through distance learning. It has been estimated that the workplace e-learning market in Europe is developing at a rate of 30 percent per annum.

Key findings
The main advantage of e-learning for **employers** over traditional methods is that it saves employee time which can then be spent working in the workplace. Employers can also encourage this by only providing short e-learning modules (sometimes developed in partnership with universities) that can be undertaken at work and not allowing employees to undertake longer courses of study.

Other benefits associated with e-learning for employers include improving organisational performance, addressing specific performance or competence problems in a timely way, and facilitating organisational change.

The most critical component of e-learning for **employees** is its ability to improve their career advancement or their performance in their current role (and it can also assist them up-skill and change careers if they are compelled to do so). Economically it makes sense for employees to remain employees while learning, rather than having to become a student, and e-learning allows this to occur.

Employees also like e-learning because they have greater control over when they do the training.

These differing motivations highlight the employee model of e-learning where the employee, takes responsibility for their own learning either in relation to their own employability or their own self development.

E-learning is also useful in developing and sharing knowledge through online learning communities of practice. These communities can enhance the learning experience, increase individual motivation, and transcend cultures and national boundaries.

Learning and technology - what have we learnt?

Author: Sloman, M.

Reference number: 133

Year of publication: 2010

Introduction
The predominant model of workplace e-learning has been self-paced. Employees are expected to access materials at work (or home) and work through them in a self-directed manner. These materials can be developed 'in house' or sourced from an external supplier and are normally delivered by a course management system. This article is based on research conducted by the UK's Chartered Institute of Personnel and Development (CIPD) from 2001 to 2008.

Key findings
Web 2.0 technologies allow much more collaboration and users to generate their own content. E-learning needs to shift learners from training (an instructor-led, content-based intervention, leading to desired changes in behaviour) to learning (a self-directed, work-based process, leading to increased adaptive capacity).

E-learning is not a popular option for employees who prefer the social, more active (and interactive) nature of traditional methods. But despite this learner indifference and trainer resistance e-learning uptake is growing. This is in part because management and training and learning departments perceive more and greater benefits from e-learning than do learners and trainers.

The following principles should underpin any e-learning strategy, programme, or intervention:

- **Start with the learner**: Recognise the needs, preferences, strengths, and limitations of the target audience.
- **Relevance drives out resistance**: Relate the e-learning programme to issues that matter to the organisation.
- **Take account of intermediaries**: Learners need advice and guidance and should not be left in isolation to undertake e-learning.
- **Embed e-learning in the organisation**: Link e-learning with traditional delivery courses and other human resource management systems (e.g. performance appraisal).
- **Support not automate**: E-learning should support an organisational strategy that provides a range of formal and informal support mechanisms for learners in their learning and working contexts (and not just be used as a tool to automate everything).

While opportunities for enhanced communication, collaboration, co-creation and sharing of content exist with Web 2.0 technologies, much of the rationale for their adoption arises from the technology, rather than the teaching and learning, domain. For example weblogs (blogs) and wikis are often underpinned by an implicit assumption that their use will automatically result in the achievement of certain learning outcomes or objectives. But blogs and wikis by themselves are insufficient to achieve these outcomes or objectives.

One of the most overlooked technologies is Google, which allows learners to access just-in-time information. However, there are challenges with levels of access, purposeful information searching, capture and incorporation of this new knowledge into the organisation's repositories and managing abuse, distractions and time-wasting.

Three factors determine the acceptance, effectiveness, and value of e-learning interventions in modern organisations:

- **Value**: Does the e-learning approach support the development of individual and team knowledge and skills that enable the organisation to deliver higher value products or better services to customers?
- **Satisfaction**: Is the e-learning opportunity delivered in a way that learners will embrace, engage with, and enjoy?
- **Efficiency**: Can the deployment and delivery of e-learning be organised in an efficient and cost-effective manner?

Additionally, organisations need to be clear on their business drivers for adopting e-learning, the learning task design effort, and the readiness and receptiveness of their employees for e-learning.

Examples of various organisational strategies include:

- Cable&Wireless a multi-national telecommunications company uses a Learning Management System (LMS) to manage its e-learning. They have a very large content repository which provides employees with relevant information which can be accessed just-in-time through their LMS' advanced search capability.
- Webinars playing a dual role of providing relevant updates as well as learning opportunities for the Park Lane Hotel in London.
- Discussion threads and expert opinions via blogs are used by Allen and Overy, a multi-national legal practice and the British Broadcasting Corporation.
- Using Second Life which allows dispersed workforces to participate together in real-time. These virtual worlds can be guided by actual instructors or pre-programmed instructions and were adopted by Duke Corporate Education, a global corporate university.
- Bracknell Forest Council in Berkshire, UK uses web-based assessment exercises for their compliance training. The results of these are used by managers and employees to identify if additional training is required and this has the added benefit of involving managers more closely with the professional learning and development of their staff.

Putting professional development online: Integrating learning as productive activity

Authors: Slotte, V. and Herbert, A.

Reference number: 134

Year of publication: 2006

Introduction
E-learning is one tool that companies use to foster learning due to its cost effectiveness and compelling administrative advantages, as well as in more recent times, its instructional design benefits including uniform and consistent delivery across the organisation, and flexible updating and studying possibilities.

However there is still limited evaluation to demonstrate whether e-learning provides higher quality training and organisational outcomes than traditional delivery.

Methodology
A multi-national food processing and marketing firm, which is the case study organisation, is based in Finland, but is included because it has subsidiaries in the US. Data was collected from tests associated with one of their key certificates and a survey. This study compared learners in the e-learning and traditional delivery versions of the qualification.

Key findings
Learners need to master the skills necessary to succeed in e-learning (which include computer and significant multi-tasking abilities as well as self-directed learning) in addition to their normal workload. This requires associated support resources and practices to be integrated into the organisational culture.

Collaboration and interaction between co-workers is essential for e-learning.

Customisation of learning content is a particular challenge. If the organisation does not have in-house capabilities for this, they can be obtained through outsourcing, partnerships, or developing internal teams.

Learners should be involved in the development of content to ensure relevance.

The e-learning was valued for its concise nature, the associated exercises and tests, convenience, the organisation-wide perspective, and that it was part of a blended approach including face-to-face meetings. Regardless of delivery method learners reported an increased understanding of the company.

But learner-learner and learner-tutor interactions were limited in the e-learning module with participation in the course's discussion board very low. Learners also struggled to fit e-learning into their daily work schedule and found the extra 'screen time' and wider perspectives time-consuming and challenging.

Overall e-learners obtained the same results, but in less time than their traditional delivery colleagues. And the e-learners studied more of the programme and studied more at work and less at home than their traditional delivery counterparts. Print materials were valuable for both the traditional delivery learners and e-learners studying from home.

A blended approach is likely to be best as employees typically favour the ability to have face-to-face interactions and being able to access print-based materials.

Tutors need to provide more support if there is to be greater interaction in e-learning courses, for example building online communities and facilitating communications between participants.

Making a difference through people development

Smith, K.

Reference number: 135

Year of publication: 2005

Introduction
This case study is based on Panasonic, one of the largest global electronics companies. To try and increase employee engagement and control costs they have explored the use of e-learning.

Key findings
For Panasonic e-learning means a blended approach. They have adopted three major e-learning solutions:

- Support pre-course preparation - going online to complete a case study. This helps identify knowledge gaps as well as making clear what the content and expectations of the programme are. E-learning also allows Panasonic to ensure that all employees have completed this work prior to undertaking their development programme.
- Virtual classrooms - using a combination of video and audio conferencing to allow real time interactions and to support mandatory participant quizzes. The response to this initiative has been positive overall and it has reduced Panasonic's costs by decreasing the workshop time and associated staff absences from the workplace. These 'classrooms' also means that the learning is better aligned to the workplace and participants have more time to understand the programme's concepts and apply them in practice.
- Webcasts - online presentations which are supported by live audio and video of the presenter. This in turn allows discussions between the presenter and the virtual audience.

Training the elearning way

Author: Soccio, D.

Reference number: 136

Year of publication: 2012

Introduction
It is critical that firms understand learner use of technology. The rationale for adopting e-learning needs to be clearly articulated to learners with carefully scaffolded learning activities used to demonstrate its value.

Key findings
The technology used needs to fit organisational requirements and the differences between e-learning and traditional delivery in managing learner-trainer, learner-learner, and learner-content interactions need to be considered.

Choosing the right content is critical given the costs of transferring print-based materials to digital formats and environments. Content needs to meet business needs and be appropriately structured.

Materials should be organised to meet the differing requirements of learners. A blended approach should be considered, but if the learning and/or assessment cannot occur easily through e-learning it should be done by traditional methods.

Structuring and navigation are also vital because learner support for the materials might not be available when they need it. Adopting social media should be considered to increase the course's interactivity and learner engagement.

Empower learners where possible by letting them decide what they want to learn, how they will learn it, what tools they need in order to learn, and what learning pace suits them.

Trainers might want to consider taking an online course to experience e-learning from a learner's perspective so they can effectively support increased learner autonomy and responsibility. They also need to individualise feedback to learners, seek feedback about their support, and assess if deeper learning has occurred that has successfully changed workplace activity.

Mapping how e-learning will make a return on its investment is also crucial.

Knowledge work in a connected world: Is workplace learning the next big thing?

Author: Straub, R.

Reference number: 137

Year of publication: 2009

Introduction
As information and communication technologies have developed, the use of them for workplace learning has increased. However, predictions about the wholesale uptake and efficacy of workplace e-learning have been largely overstated.

Key findings
It is important to define the problem that an e-learning solution might solve as well as learner requirements for using it, rather than focusing on the technology.

Workplace e-learning research needs to recognise that it is simply a means to an end, where the end is to create superior value in an ever-faster moving, more complex, and more unpredictable global marketplace.

The emphasis should be on moving away from prescribing and managing learning content and programmes, towards supplying knowledge workers[10] with the skills and capabilities needed to encourage the building of knowledge-creation and learning communities which interact seamlessly with the workplace.

Experts from different fields need to work together to explore and solve problems and issues from diverse angles and perspectives. These experts include those from the human resources, organisational behaviour, general management, and the innovation and technology management fields.

[10] Knowledge workers are defined here as employees whose work is non-routine, creative, problem-solving, innovative, and change-oriented.

The role of e-learning in the learning mix

Author: Taylor, D. H.

Reference number: 138

Year of publication: 2008

Introduction
While the UK's Chartered Institute of Personnel and Development 2008 survey has many contradictions in respect of e-learning, the overall message is clear: e-learning is now part of the workplace learning mix and practitioners are increasingly confident about using it.

Key findings
In contrast to earlier surveys fewer respondents think e-learning is a 'waste of money'. This reflects a shift away from e-learning being little more than computer-based training to being viewed as a delivery mechanism with effectiveness determined by how it is used.

65 percent of respondents strongly agree e-learning is more effective when it is part of a blended delivery approach. Although only 10 percent of employee training time involves e-learning, counting the use of Google, online help, and email would significantly increase this.

Typically respondents found e-learning challenging with 80 percent of respondents noting that it required new skills for learning and development practitioners.

The suite of available technologies ranging from webinars and email to social networking can all be used to support workplace learning, but also are part of a trend taking e-learning away from page-turning on the screen to being a social experience, and from centralised 'push' (where all content is supplied to learners irrespective of need), to individually driven 'pull' (where learners access only the content they need on a just-in-time basis).

E-learning's ability to produce strategically useful data is unique. This data includes being able to clearly identify employee skill gaps as well as their preferred ways of gathering information.

E-learning should not be merely 'ticking a box'. If sufficient numbers of employees cannot be persuaded to engage in e-learning then organisations should consider diverting these resources elsewhere.

Learning and development departments should help provide more timely access to relevant online information.

Organisations should network with their peers to share good practice in the implementation of e-learning.

Organisations should establish how e-learning can provide the requisite data to support their learning and development strategy (which should be developed if one is not currently in existence).

TEL@work: Toward integration of theory and practice

Authors: Tynjälä, P., Häkkinen, P., and Hämäläinen, R.

Reference number: 144

Year of publication: 2014

Introduction

Ever increasing amounts of available information mean there is an associated need to continually update competencies. E-learning is most often associated with formal workplace learning and can support semi-authentic learning experiences, co-construction of content, and remove many of the time and place constraints present in traditional delivery. However, informal learning is equally important in workplace contexts. And e-learning can and should integrate this with formal learning approaches to develop the expertise necessary to meet the demands of the modern workplace.

Key findings

Critical success factors for workplace e-learning include ease of use, flexibility and accessibility, taking into account learners' needs and motivations, managerial support, having an appropriate organisational culture, and the inclusion of traditional delivery. The model proposed here incorporates different forms of expert knowledge to support an integration of formal and informal learning.

It is underpinned by an underlying integration of theoretical and practical knowledge whereby practical knowledge is adequately conceptualised so that this conceptual knowledge can be applied in practice. It also includes tacit organisational knowledge which is best obtained through communities of practice. These communities of practice can be effectively developed, maintained, and supported through social media.

Social media also has the potential to provide personalised, portable, and engaging workplace learning experiences as well as assisting in the development of soft skills. However, without effective pedagogical approaches and support these tools will not realise their potential to support workplace learning.

Some firms are using social intranets where employees can create content and connect in a meaningful way with other content providers. Weblogs have the potential to support effective knowledge dissemination and sharing, but are often underutilised because employees were unsure of how to use them or of the value in doing so.

3D and simulation environments allow team as well as both formal and informal approaches to problem solving to be adopted while at the same time supporting more authentic learning experiences. However, despite the optimistic notions about 3D environments in workplace learning contexts, research has shown that the quality of participants' activity, rather than the virtual environment itself, brings about changes in the development of competencies. It is also important to provide effective support for collaborative learning because without this these environments can actually hinder learning.

Exploring corporate e-learning research: What are the opportunities?

Authors: Waight C. and Stewart, B.

Reference number: 150

Year of publication: 2009

Introduction
E-learning is an integral aspect of most companies' learning architectures and a key component of their learning and development strategies. As a result more will be expected of workplace e-learning and to meet these changing and increased expectations it will need to continue to grow and transform. Exploring present and future corporate e-learning research is pivotal because this informs the creativity and innovation that drives workplace e-learning's success.

Methodology
This review used keywords to select literature from a small number of specialist databases. Unpublished literature and books/chapters were excluded. 21 articles published between 2001 and 2008 were selected as their sole focus was on corporate (rather than academic) e-learning. The two areas of focus were the literature's methodologies and the questions, problems, and issues they addressed.

Key findings
The primary focus of corporate e-learning research has been at the operational level.

There were four main themes arising from this literature review:

1) Maximising the impact of corporate e-learning - the delivery of productivity and performance improvement gains, the linking of knowledge management to e-learning, its relevance to workplace activities, meeting learner needs through engaging and authentic content, and the continuous revision which is necessary to improve processes and outcomes.

2) Exploring the nature of e-learning in corporations - this theme includes blended training which combines e-learning with traditional delivery methods, identifying learners' needs, the adoption of a rapid e-learning approach (noting that this approach is content-centric and not very interactive), and assessment and evaluation for both the organisation and learner.

3) Understanding and articulating the role of instructional design and technology - incorporating technological advancements to support well designed workplace e-learning initiatives.

4) Adult teaching and learning issues - understanding how adult learners learn, their existing skill and knowledge levels, and creating more learner-centric initiatives and materials.

Whose context is it anyway? Workplace e-learning as a synthesis of designer- and learner-generated contexts

Author: Whitworth, A.

Reference number: 154

Year of publication: 2009

Introduction
This article focuses on the tension between whether it is better for workplace e-learning to be developed by designers or learners, and argues that these perspectives should be complementary rather than opposed.

Key findings
Workplace e-learning environments tend to be heavily biased towards designers with limited opportunities for learners to have meaningful input. Some e-learning solutions adopt a checklist approach which typically limits learner input to the development stage rather than post-course evaluations which could be used to incrementally improve the course.

Where post-course evaluations are conducted they generally only assess learner satisfaction with the e-learning course and the immediate effects of the training. Very few assess long-term application of the learned skills, nor the overall return on investment (including learners' time to participate in the course). Worker evaluations should be continual to incorporate informal learning processes into formal e-learning courses.

Given the increasing functionality of Web 2.0 technologies in particular, it is now possible and desirable to include learners more in the design and development process because it increases the pool of expertise within the organisation and this makes business sense.

One way to facilitate increased worker participation in the design and development process is through communities of practice, while noting that they can be too rigid and not receptive to innovation and change, and less effective organisation-wide or across geographically dispersed workforces.

Effective e-learning needs all stakeholders to have positive attitudes towards it. Senior management are critical because if they view e-learning merely as a way to improve task performance they miss the opportunity for it to transform the organisation or its component parts.

Workplace e-learning is better served by communities of interest or networks of practice not communities of practice. These can be difficult to implement because these groups often lack a common dialogue to unite them and guide their activities.

Designers, trainers/tutors, and learners should work actively together to find solutions to common problems. 'Brokers' should coordinate different groups and be supported by appropriate organisational hubs.

This would help jointly identify and overcome resistance to e-learning and promote strong communities as well as successful workplace e-learning. Increased worker autonomy has many benefits for businesses including increases in both job performance and satisfaction.

Neither designer-generation nor learner-generation is desirable in itself. Each can instead act as a check or balance on the undesirable aspects of the other.

Workforce training in England 2006

Authors: Winterbotham, M. and Carter, K.

Reference number: 156

Year of publication: 2007

Methodology
A survey was conducted with approximately 4,000 English employers. This was supplemented by 50 interviews. The sectors covered were: primary, utilities and manufacturing, construction, wholesale and retail, hospitality, finance and business services, public, health, education, transport, and other. A range of organisational sizes were also covered from two to four employees to 500+. Larger employers were overrepresented, because of their importance in terms of employment.

Key findings
The most common method used to deliver training was via in-house staff at the employee's workstation. Other common methods were training conducted by external providers either off-site or on-site (but not at the employee's work area).

The most common types of training delivered related to health and safety and specific job skills. However, large numbers also received training related to new technology or office IT packages.

Managers and other professionals were the most likely to have received training.

Larger employers were much more likely than smaller employers to provide training, and more likely to have a training plan and associated budget.

Almost two-thirds of employers relied on staff to participate in some form of self-learning (which included e-learning). For smaller employers this was the most common training method adopted, but a majority also trained staff at their own workstations.

Only a minority of staff were working towards formal qualifications, and outside of large-scale initiatives, few were aware of relevant government programmes.

Blended learning in military training

Author: Wisher, R. A.

Reference number: 157

Year of publication: 2012

Introduction
The US Department of Defence has a massive number of personnel to train (about 3 million) and a correspondingly large budget (about US$17 billion per annum). They have used a wide variety of technologies to support their training efforts including CDs, intelligent tutoring systems, simulators, and satellite delivery as well as traditional delivery.

Key findings
Intelligent tutoring is used to supplement training. It overcomes the limitations of other virtual training through its ability to provide regular and informative feedback to trainees.

Using intelligent tutoring led to a significant increase in learning above the mean performance for the traditional delivery group.

Web-based technologies are also used in conjunction with traditional delivery to provide a blended approach to particular aspects of military training.

Simulators and virtual environments are also extensively used, in part to reduce the number of accidents and fatalities associated with peacetime training. Recent advances now allow simulators to be linked to actual weapons platforms, providing increased authenticity to the virtual training experience.

These simulated environments can be used on a very large scale to support joint exercises involving multi-national forces. The key objective with these environments is that participants cannot tell the difference between the simulated and actual environments.

The Department of Defence's future vision referred to as Advanced Distributed Learning envisions a blended environment where learners are engaged with interconnected learning activities involving a range of technologies including games, learning objects, and intelligent tutors. This vision will be supported by the creation of appropriate content repositories and learning libraries which in turn will be underpinned by a Learning Management System and content that uses SCORM (Shareable Content Object Reference Model) standards.

Snapshot of e-learning: All you need to know about the new wave of training

Author: Wiseman, L.

Reference number: 158

Year of publication: 2005

Introduction
The initial key driver behind corporate e-learning efforts was the potential for cost savings including reduced publishing and distribution costs, decreased travel expenses, less time away from the job by employees, and less time spent on learning. The current thinking is that e-learning can efficiently train a globally dispersed audience. Learners also value the flexibility of pace and place that e-learning provides.

Key findings
Flexible learning needs to be engaging and add value to the learning experience. Flexible learning also includes learner selection, induction, course orientation, instructor training and facilitation, and programme assessment and evaluation.

Well designed flexible learning supports the main learning styles - auditory, visual, and kinaesthetic. It also allows for enhanced learning opportunities and can assist learners to become more independent and self-directed.

Irrespective of delivery mode, flexible learning must be underpinned by sound learning strategies which allow greater learner responsibility, with instructors taking on more of a guidance/facilitation role.

Learning by doing helps learners engage in higher level thinking activities like problem analysis, synthesis, abstraction, and reflection.

E-learning design needs to meet both the individual's and organisation's needs and should include speed, and security of internet access and downloading; the cycle times for assessment and feedback; a user-friendly interface; and the ability to record sessions so they can be revisited by learners. Infrastructure should include interactive whiteboards, desktop sharing, email, internet relay chat, and voice-over IP software.

Software to support effective virtual learning environments can be broken down into three broad categories: reproductive/transmitting (drill and practice), explanatory, and transformative (where understanding is constructed by the learner assisted by the instructor).

Multimedia enhanced digital content should provide educational benefits, be supported by sound teaching methods, and contribute to enhanced learning outcomes. It also needs to be supported by a comprehensive professional development programme for the trainer aimed at increasing their and their learners' competencies in the e-learning process.

7 EXPERIENCE WITH E-LEARNING

Social media is not a fad - it's the future!

Author: Bartlett-Bragg, A.

Reference number: 7

Year of publication: 2012

Introduction
The rapid rise of 'social business' is not only enabled by using social technologies it is also reflected in how work itself is being redesigned.

Key findings
The initial data from early adopters of these technologies suggests:

- Organisations that use collaboration and social networking tools are 57 percent more likely to outperform their competitors.
- 65 percent of employees report being able to answer queries more quickly.
- 83 percent of new workers feel better connected with their co-workers.
- Courses incorporating social technologies have completion rates of 97 percent compared to 60 percent for those solely using traditional delivery.

But the lack of effective use of social media by organisations is increasingly frustrating their employees who have high expectations based on their personal use and experiences. For example, some employees are now bypassing organisational systems in favour of their own devices.

Social media does present challenges for organisations and trainers alike because it is different from traditional delivery and typical e-learning courses. Learning with social media can appear chaotic because of the level of dynamism and learner control.

From a learner perspective, however, social media has a number of benefits including increased empowerment, more active engagement, and deeper levels of reflection. But it is not about the social media technologies, rather how they are used.

Despite the challenges, if organisations can effectively integrate social media into their learning strategies they can generate much larger and more robust learning networks. These networks allow current learning practices to be challenged by reframing the transfer of knowledge and skills in traditional delivery modes to participatory environments where learning comes from social interactions.

Implementing social media not only extends existing practices, but can also support organisation-wide continuous learning. Learning needs to be discretely embedded in daily practice, rather than being removed from it.

There also needs to be a shift away from emphasising content to refocus delivery on providing learners with new and contextually relevant ways to access information, engage with others, and provide opportunities for transfer and application of knowledge and skills to the learner's workplace situation.

Using animated agents in learner-controlled training: The effects of design control

Authors: Behrend, T. S., and Thompson, L. F.

Reference number: 11

Year of publication: 2012

Introduction
E-learning provides the opportunity for immediate individualised feedback and greater learner control. But greater learner control does need increased levels of learner motivation, engagement, and sufficient time allocated to complete learning if it is to be successful. Therefore the success or otherwise of e-learning heavily relies on good learner choices.

Intelligent agents are software that gather information from users and return customised content.

Methodology
This study used four control and non control groups. The control groups could select one of the key features of their intelligent agents (e.g. ethnicity, appearance, and personality and feedback style), whereas the non control groups had no input into the agent design. They were matched to a control group that had designed a particular feature of the agents, and were aware of the agent's characteristics prior to the commencement of training. Participants' survey responses were combined to construct an overall scale score.

Key findings
In theory giving learners too much control can overwhelm them and lead to poor learning outcomes whereas in this study the more control learners had the more knowledge they acquired.

The choice of appearance, personality, or feedback of their intelligent agents had no significant effect on participants' knowledge whereas multiple choices did significantly increase it.

Contrary to expectations, the choice of feedback style significantly decreased post training self-efficacy. However, being able to choose the agent's appearance significantly increased post training self-efficacy and module completion.

Giving learners more control over the design process could help reduce incomplete or abandoned training but it is critical to ensure the right levels of control are provided (e.g. allowing learners to control the appearance, but not the feedback style, of intelligent agents).

Changing the model of workplace e-learning: A platform to facilitate autonomous social e-learning for adult learners

Author: Betts, B. W.

Reference number: 12

Year of publication: 2013

Introduction
To alleviate poor quality experiences of e-learning, organisations have adopted a range of specialist tools and software including Adobe Captivate and the Blackboard Learning Management System. However, these tools do not prevent the key problems with corporate e-learning which are its lack of interaction with instructors and other learners, or a lack of personalisation. This is despite the emerging social media technologies which make interactive, personalised user experiences possible.

Methodology
A literature review and interviews with industry-based specialists to further investigate the role of game-based learning was undertaken. The online platform that forms the basis of this thesis (Curatar, which delivers courses in the form of a game with participants winning XP Experience Points) was evaluated through a series of case studies.

Key findings
To offset learning completed in isolation and overcome learner prejudices and perceptions, many organisations have adopted interactive e-learning authoring tools, web-based virtual communities of practice, weblogs, wikis, and Learning Management Systems.

To maximise the potential of these newer technologies Computer Supported Collaborative Learning has emerged. Although this allows learners to contribute, create, and critique each other's work, there is limited instruction, support or moderation, which can make the approach questionable.

Some research suggests that gaming approaches might increase learner motivation and lead to more active engagement and participation in learning. However, the cost and skill sets required to design, build, and deliver a digital game for learning tends to be prohibitive (estimated $US1 to 5 million). For a system like Curatar, learners gain XP Experience Points through viewing, commenting, and contributing back to the course, and then progressing through the XP levels. By providing a hybrid model of course authoring and delivery in a single platform, Curatar reduces the time and complexity associated with creating and delivering an online course.

Costs are further reduced by using existing content structured in a non-academic way, which can be added to by learners, instructors, and subject matter experts. This approach allows Curatar's courses to remain relevant and personalised without significant centralised effort.

Curatar has been used by The European Safety Bureau (ESB) to deliver and accredit health and safety training courses across Europe, by Barclays Bank in the UK to train its new auditors, and by Canada's largest credit union, Desjardins, as part of its overall learning support. This has allowed these organisations to provide large scale training at low cost.

An alternative solution is to adopt game-based practices such as badges and other non-formal accreditation and reward schemes without developing an actual game-based learning environment. However, these rewards need constant adjustment to maintain higher levels of user engagement.

Educational and financial impact of technology on workforce development

Authors: Carruth, P. J., and Carruth, A. K.

Reference number: 23

Year of publication: 2013

Introduction

Technology innovation is rapidly transforming the way people are trained, while at the same time becoming a key tool in building business capacity, and increasing workforce skills and competencies. E-learning is a promising solution to the increasing need for rapid, flexible training where the rate of change in production processes requires more ongoing training and retraining than previously.

Researchers also agree that e-learning will continue to be directly related to future business earnings and sustainability, and will be necessary for workers to remain competitive in an ever-changing global economy.

Key findings

E-learning presents a wide range of opportunities for business growth by integrating technology with instructor-led and real-time facilitation in a collaborative environment. E-learning is also being used by companies to teach skills, develop talent, and provide information and training in a cheaper and more time efficient manner while being available '24/7' from anywhere.

Fortune Magazine estimates that training previously taking six to nine months using traditional delivery approaches can be compressed into two to three weeks using e-learning. Once the initial investments in e-learning have been made, the cost of training additional workers is close to zero.

Although e-learning is not suited to all learners, learning styles, and learning environments, it can resolve the barriers of lack of time and geographical isolation. E-learning provides a viable opportunity for increasing workforce capacity and efficiency rather than being a panacea for all learning related issues.

E-learning has 10 major advantages for workforce development including: real-time learning; retention of staff; personalised training; learner ownership and empowerment; simulation; collaboration; anytime and anywhere delivery; cost-effectiveness; and a quantifiable return on investment.

E-learning can also help overcome motivation issues for learners, problems accessing educational opportunities, and the negative legacies of prior educational experiences.

The most basic prerequisite for successful e-learning is the provision of an appropriate technology-based infrastructure. Also needed is proper staffing to support this new learning environment.

To establish return on investment companies are measuring knowledge gain and retention.

It is projected that nearly all workplace training will be available through the internet in the future, but it will also include a traditional delivery component. Mobile learning was the most likely new development in workplace e-learning followed by course development tools and social networks. However, despite these efforts it still remains unclear as to whether or not e-learning is actually improving employee performance, due to limited evaluations.

A study on the critical success factors for corporations embarking on knowledge community-based e-learning

Authors: Chen, R.-S., and Hsiang, C.-H.

Reference number: 27

Year of publication: 2006

Introduction
E-learning may emphasise personal achievements rather than organisational benefits, however it is rapidly becoming a contributor to organisation-wide knowledge management and competitive advantage.

This case study examined AM Company, the world's largest provider of semi-conductor manufacturing equipment and services. They are based in the US, have a global workforce of more than 16,000 employees, and set up an e-learning system to support communications between different group members in their offshore subsidiaries. This was done to resolve the problems arising from lack of communication and consistency which had led to inappropriate and duplicating/overlapping systems and investments, too much variation in procedures, and inefficient or ineffective information dissemination.

Key findings
Their e-learning system was based on meeting the company's business and knowledge strategy. The system was designed as a knowledge community to allow members to learn the core skills of their work using information and materials from a database or from company experts

Their dedicated training system is supported by a portal which allows employees to construct personalised and flexible learning. They also used their e-learning system to better communicate within the company and undertake more efficient resolution of problems.

Their financial evaluation showed systems were integrated and that procedural efficiency had increased. Their estimated cost savings from this were US$16 million. They also reducing overlapping investment at their branch offices.

Systems integration meant that its customer services were coordinated which increased the company's competitiveness and raised their levels of work efficiency. Systems integration has also led to progressive integration of their procedures. Knowledge innovation has sped up. The e-learning system has also reduced the reliance on outside information and increased the overall knowledge base of the company.

Several critical success factors were identified:

- the participation and support of key personnel and the development of a knowledge strategy
- the procedural design needs to complement current work while establishing a knowledge sharing loop
- the technology should be learner-focused and must support company business goals and extract important findings
- implementing new strategies and getting managers to 'sell' them to employees
- establish a learning culture and incentivise knowledge creation and sharing
- provide sufficient time and space for learning and establish mutual trust between team members.

Transformation of sales skills through knowledge management and blended learning

Authors: Chute, A. G., Williams, J. O. D., and Hancock, B. W.

Reference number: 30

Year of publication: 2012

Introduction
The Avaya Company employed a blended learning model to speed up the adoption of a new customer-centric consultative sales approach. Part of the new training environment was the establishment of web-based communities of practice which were noted by research as being useful.

Key findings
A learning portal containing hundreds of knowledge assets ranging from more formal documents such as white papers or research reports, to less formal ones such as PowerPoint presentations assisted employees to access information most relevant to their current tasks, as well as links to a list of related and recommended training courses. It also allowed users to check out related content being used by colleagues.

Use of the portal was promoted through periodic technology-supported training sessions including a monthly internet teleconference. This blended approach dramatically improved the impact of the portal's knowledge assets on business results.

To support the portal, other similar projects and a special in-house institute were created. In addition to expanding the portal they created a solutions knowledge centre which categorised knowledge to dramatically improve employee access to relevant, just-in-time knowledge.

The institute also created a specialist training programme for sales which included online learning and two week-long traditional delivery sessions. Students could track their progress on the programme's website. To graduate they had to complete an actual customer sales experience using the knowledge and skills gained from the programme.

Its impact was considerable because it vastly improved employee performance as well as having a material impact on their financial bottom line. Six months after its launch, it contributed to the generation of increased revenue of US$36.3million with a 46.1 percent return on investment.

Putting blended learning to work

Author: Collis, B.

Reference number: 35

Year of publication: 2012

Introduction
Shell Exploration and Business (Shell EP) has developed a design method based on research and best practices for technology-supported activity-based learning. They have developed a suite of tools to guide each team through the process of course redesign. Work-based activities that the courses support include orientation, workplace information collection, product development, and sharing and reflecting.

Shell EP also provides more traditional learning activities including studying the conceptual material related to the subject matter, calculation exercises, quizzes, case studies, and working with simulation software. Their health risk assessment course shifted from a one-week traditional delivery format to an online supported environment. This was done due to the difficulties in organising schedules for employees and trainers and the lack of connection to authentic work-based activities. In addition to the online support and learning, participants are coached by experienced staff in their own workplaces.

Key findings
The evaluation results show that the work-based activities increased employee competence, application of learning, and sharing of knowledge in the workplace both locally and globally.

But peer-peer interaction needs to be more integrated into course activities as well as ensuring that employees have sufficient time and resources to carry out the expected activities.

Work-based activities are more difficult to manage in terms of expectations of how long they will take to complete than traditional delivery. Work-based activities must also be directly relevant and valuable in the work place. Supporting technologies including the web platform must be easy to access, simple to use and flexible.

Course instructors will need support to adjust to their expected new roles in this type of approach and an integrated approach to implementation and course design is required. This approach to blended learning must also reflect corporate strategy and needs if it is to attract and retain organisational support.

New life for corporate training

Author: Dannenberg, D. R.

Reference number: 40

Year of publication: 2011

Introduction
Despite widespread use of the internet to deliver workplace training, Second Life (a virtual environment where users are in control of their physical appearance and surroundings and can easily interact and converse with other users) has not been widely adopted to support workplace training.

Key findings
Although many companies were using virtual environments for training purposes, very few were using Second Life for training purposes and most had limited enthusiasm for doing so.

Companies have four main objections to using Second Life to support their training:

- too steep a learning curve for developers, instructors, and trainees – this could be addressed by short, introductory sessions to familiarise trainees before they participate
- costs – especially re upgrading infrastructure to run Second Life
- the requisite technologies to support it – device specification levels required
- security concerns – firewall access, customised security settings, or private environments.

While there are additional costs for participating, these are substantively less than if a company tried to construct a similar environment from scratch.

Companies can use Second Life to:

- relay information via 3D capabilities
- support training with 'real life' movement and interactions
- create a largely authentic scenario with Play2Train for trainees
- create self-paced training programmes with personalised visual appeal
- provide dialogue and interactions with avatars
- create multiple scenes or environments within limited space, which allows interconnected programmes and projects
- support collaborative and peer learning, in both unarranged and pre-arranged ways.

Second Life also more easily allows experts (both peers and instructors) to pass on their knowledge and experiences to novice trainees and participants.

Learning on the move: How m-learning could transform training and development

Author: Donnelly, K.

Reference number: 44

Year of publication: 2009

Introduction
The use of mobile devices is becoming increasingly common. But how can organisations exploit mobile learning for their staff and therefore improve their competitiveness? Mobile learning was defined here as the ability to learn independently of time and place, facilitated by a range of mobile devices (e.g., iPods, mobile phones, and MP3 players).

Key findings
Mobile devices allow access to 'bite-sized' pieces of information such as online quizzes, assessments, and skills checks. Bite-sized is important due to the risk of interrupted service.

Wikipedia and similar sites can be used to provide reference materials. These materials along with audio/video based learning can provide trainees with 'tips' on particular subjects. For example, audio sales tips relevant for a specific type of customer can be delivered through an iPod and accessed en route to a client meeting (typically simple, self-contained processes required at a point in time).

Short, interactive videos are also an effective delivery mechanism for workplace related training and education.

Mobile devices are most likely to be used as part of a blended learning approach or in providing ongoing access to further learning support. They are especially effective for rarely used or complex procedures that are unlikely to be memorised. Mobile learning can allow workers to study during periods of downtime, overcoming the challenge of decreasing time for all activities.

However, given the nature of mobile devices, organisations need to think carefully about the format of training materials they make available on them. For learning supporting staff performance it is best provided in the forms of text (SMS) on a mobile phone.

A checklist for organisations considering adopting mobile learning
- Ascertain the mobile technology the organisation and its staff use.
- What media does the type of device support, for example, voice, text, still images, animation, video? How flexible is the interface?
- The content should be simple and be able to be developed by an organisation's IT department.
- The mobile learning content should be part of a blended delivery approach. Mobile learning should be used to enhance, not replace, other delivery methods.
- Test a range of approaches if necessary because this is a new field and as yet there are no hard and fast rules.

Learning at the speed of need: The top ten tasks for L & D in 2014

Authors: E-learning age and City & Guilds Kineo

Reference number: 45

Year of publication: 2013

Key findings

The increasing sophistication and availability of IT means staff expect to access learning as and when they need it on whatever device suits them. They are also less tolerant of technology failures and are more willing to use non-work networks to support their learning. In addition a more personalised experience is expected.

The increasing adoption of IT and more sophisticated use of it by customers and staff are driving changes independently of businesses' e-learning and technology strategies. Often employee or customer technologies are more advanced than the corporate ones. Outside of formal Learning Management Systems assessment becomes more complex and challenging. The development of 'badges' has a role to play in assessment and recognition.

The role of line managers is critical. They need assistance to effectively engage with online tools including e-portfolios. Workplace e-learning also needs to recognise and utilise learners' existing social and professional networks, for example Facebook for networking, but also recognise and support staff whose work environment prevents them accessing e-learning (e.g. those who work in retail or call centres).

There is a risk that e-learning becomes chaotic with the proliferation of informal learning, and control shifting from development departments to customers and staff. Structured resources, guides, tailored searches, and filters should be used to avoid this potential chaos. Workplace e-learning needs to stay abreast of the latest internet-based technologies and their potential should be explored through low cost pilots. Quality and relevance are critical. Content needs to be authoritative.

One of the other common features of modern web-based technologies is their ability to 'push' information of interest to users. Professional networks like LinkedIn and newer Google applications can effectively support workplace learning.

Learning and development departments can also use Google's improving ranking system which is starting to base its searches on whether the content comes from an authoritative source or not (as determined by other users). Firms could adopt a similar approach by making better use of their own subject matter experts in content development rather than solely relying on training and development personnel.

The report recommends that organisations adopt the following:

1. Establish a culture of pervasive learning.
2. Make the learning experience more cognisant of a learner's needs, preferences, and location.
3. Understand new technologies and keep abreast of them - pilot and test ideas in a low cost way.
4. Aim to adopt a personalised approach mirroring what Google can currently offer its users.
5. Improve systems and reduce their cost through technology - design e-learning for emerging web standards and adopt standard web technologies
6. Make assessment an experience, not an event. Assessment should be ongoing, experiential, and available through multiple channels. It should also utilise informal accreditation like badges to recognise employee learning efforts.

Digital simulation-based training: A meta-analysis

Authors: Gegenfurtner, A., Quesada-Pallarès, C., and Knogler, M.

Reference number: 49

Year of publication: 2014

Introduction

Digital simulations are becoming increasingly popular in professional training environments for developing complex cognitive skills. However, their effectiveness remains uncertain. Their increasing use is underpinned by two assumptions. Firstly, that digital-simulation training environments are more motivating than traditional delivery. And secondly, that digital simulation training environments more readily transfer skills than traditional delivery. This is based on research which suggests that skills transfer is more likely to occur in authentic training environments which digital simulations more readily provide.

Self-efficacy is also important in skills transfer and this too is more likely in digital simulations. But self-efficacy and skills transfer are unlikely to occur unless the digital simulations are well designed. While self-efficacy and skills transfer are more likely to occur in team-based, than individual, simulations overall it is uncertain which particular instructional design characteristics support effective digital simulations.

Methodology

Only studies on individuals were included. They also had to have objective performance measures to assess skills transfer. The time frame for the literature was 1993 to 2012. 15 studies with a total of 2,274 learners were selected.

Key findings

Their findings indicate that individuals are more likely to increase their self-efficacy and transfer skills when they train alone rather than as part of a team. Simulated time flows were more effective in skills transfer than 'real-time' simulations. Digital simulations that allow users to increase the difficulty level are more effective in skills transfer than simulation environments where there is no increase in difficulty or where this is determined by the system.

It appears that three-dimensional simulations are more effective than two-dimensional ones. Assessment feedback that occurred after training was more effective in increasing self-efficacy and skills transfer than feedback that happened during training. The results also confirm that self-efficacy has a strong correlation with skills transfer.

Increases in self-efficacy and skills transfer are more likely to occur in e-learning environments than traditional delivery ones. However, the results also confirm the overall literature that these gains in self-efficacy and skills transfer are unlikely to occur unless the digital simulation training environment is well designed. Based on these findings the key design characteristics that should be employed in digital simulation training environments are allowing users to control the level of difficulty and offering assessment feedback after training.

Effects of computer support, collaboration, and time lag on performance self-efficacy and transfer of training: A longitudinal meta-analysis

Authors: Gegenfurtner, A., Veermans, K., and Vauras, M.

Reference number: 50

Year of publication: 2013

Introduction
Self-efficacy refers to an individual's belief that they have the capabilities to successfully complete set tasks. Transfer of training is defined as 'the productive use of newly acquired knowledge and skills in application contexts on the job'. However, the links between self-efficacy and training transfer are often unclear.

The study's hypotheses were:
1) Training transfer would be positively related with pre- and post-training performance self-efficacy.
2) This positive relationship would be stronger for the post-training than for the pre-training measure of self-efficacy.
3) The size of the self-efficacy-transfer relationship would decrease with an increasing time lag (time between last day of training and when measuring transfer of training).
4) The relationship between self-efficacy and transfer would be more positive in training conditions affording computer support.
5) The relationship in hypothesis 4 would also be more positive in training conditions with collaboration.

Methodology
This study's meta-analysis consisted of longitudinal studies reporting correlations between performance self-efficacy and transfer of training before and after training between 1986 and 2010. Literature that only included pre- or post-training measures and group (not individual self-efficacy) was excluded. 29 articles were selected for this study with 4,158 participants with no significant gender or age differences. The mean time lag for the studies was about 48 days.

Key findings
The study's results support hypothesis 1.

The results relating to hypothesis 2 are unclear due to the large gaps in the credibility levels.

Hypothesis 3 was not supported as the results suggest that the number of days after training had a negligible effect on the size of the correlation between self-efficacy and transfer.

Hypothesis 4 was supported. The relation between self-efficacy and training transfer was strengthened shortly after training, but this effect weakened as time passes.

Hypothesis 5 was also not supported because the results showed that trainees in collaborative training environments had lower performance than their counterparts in non-collaborative training environments. However, small sample size limitations are noted.

Overall, computer support is more important than collaboration in enhancing the linkage between self-efficacy and training transfer.

Four strategies for remote workforce training, development, and certification

Author: Gibson, R.

Reference number: 51

Year of publication: 2014

Introduction
To address critical skills shortages companies are increasingly up-skilling their own staff. However, this is difficult when employees are geographically dispersed and often do not have the time for lengthy periods of training. This article outlines four strategies to address the challenges associated with training and certifying geographically dispersed workforces.

Key findings
The first strategy recommended here is allowing access to professional development opportunities through open systems. This strategy utilises existing Massive Open Online Course partnerships, platforms, and provision to train and certify large, remote workforces.

The second strategy is alternative accreditation schemes (i.e. badges) which act as credentials for remote workforces. The latest badges contain critical data that can be used to not only determine worker competency, but the origin of the sponsoring agency and any technical standards associated with it. These micro-credentials are not often used in work related contexts. However, they can allow employers to be much more specific about the types of skills they require and have an associated credential to match. These skills will not only be relevant but much more current than those associated with formal qualifications.

The third strategy involves the use of 'serious' games and simulations to train remote workforces. This strategy adds to the alternative incentives employed (e.g. points, badges etc) by employing games to deliver traditional training scenarios. The content used can also adopt gaming approaches through the use of avatars for example. Games can also be structured so learners have to master discrete stages before they can progress to the next level.

Games can also be highly interactive and realistic as well as allowing for real-time feedback to inform next steps and the overall learning. Users can compete against each other or the game itself to improve their skills and capabilities. Simulations allow users to experience and practice realistic work-related situations in controlled environments. This allows the learner to make real-time decisions and experience the impact of those decisions.

The final strategy is utilising work-based mentors and coaches for credentialing and training. These individuals sometimes referred to as e-learning champions or learning support managers' act as corporate liaisons or mentors between the company and its remote workforce. These people provide a variety of support in relation to e-learning or online credentials the learners are involved with.

Most corporations using this strategy are allowing their remote workers to tailor a curriculum and training to advance their careers and fill identified skill gaps. And this strategy is increasingly using social media such as weblogs, wikis, and chat tools to support these personalised training and career pathways.

Designing computer-supported collaborative learning at work for rural IT workers: Learning ensembles and geographic isolation

Author: Goggins, S. P.

Reference number: 52

Year of publication: 2014

Introduction

E-learning allows rural firms to collaborate with metropolitan partners and customers. The associated technologies allow employees to increase their connections with more populous areas. Research has tended to ignore the potential of e-learning to support small firms in rural and remote areas. It has also assumed that computer-assisted collaborative learning requires metropolitan infrastructure. Even where rural and remote areas are studied this is not at the level of individual firms.

There has been much attention in the literature on how virtual groups and teams can be used to support workplace e-learning. The concept of ensembles is introduced here which refers to sets of actions categorised by themes and defined by particular purposes. Ensembles help to make actions and workloads visible beyond their immediate scope which is important for distributed workforces or where firms operate in a distributed network with other firms and customers.

Methodology

This study is based on a small firm in rural US whose main business is IT outsourcing. They used organisational ethnography to analyse data collected from observing meetings, field notes and memos, and conducting interviews.

Key findings

The technology designs employed to support the firm's workplace e-learning were of secondary importance compared to employees simply learning how to use Google. Informal learning relied on good communication skills within the adopted technologies. Employees' largely used, and preferred, paper-based resources. Using Google for their work was supported by a 'cheat sheet' which was added to with solutions for specific, work team problems.

These employees also faced challenges associated with selecting appropriate technologies to support different forms of collaboration. Task lists were more useful for supporting collaborations with customers than instant messaging technologies.

Technology-mediated, informal learning allowed the firm to meet their customer needs in effective, efficient, and novel ways. But there was a limit to its usefulness in supporting staff professional development and their acquisition of more complex skills and competencies.

The firm built their collaborative learning environments around a wiki that was integrated with a work notification system based on Google Docs. To support professional development the firm allocated one staff member to become expert in particular areas. With support from the training director they constructed a curriculum on this and made it available to their co-workers through asynchronous, collaborative environments. Senior technical staff were used to monitor the discussion and resource exchange in these environments.

Social networks, web and mentoring approaches in SME continuing vocational education and training

Authors: Hamburg, I., and Hall, T.

Reference number: 57

Year of publication: 2013

Key findings

Information and communication technologies are typically used to disseminate relevant information, but if this information is not transformed and applied to relevant contexts it cannot be seen as either learning or knowledge development. Some causes for the low uptake of e-learning by small and medium-sized enterprises (SMEs) include the training culture being dominated by traditional delivery approaches; skills to adopt e-learning are missing; a lack of management support; and an absence of appropriate software and content.

In addition, European Union (EU) projects including the Analysing and Reporting the Implementation of Electronic Learning and SIMPEL also identified a reactive approach to learning, a lack of easily accessible content, limited time to explore relevant training options, and a lack of staff motivation. Another EU project, Net Knowing 2.0, is aiming to help SME trainees learn to use these technologies. The project is also providing an advanced course which focuses on the implementation of Web 2.0 based informal learning, networking strategies, and mentoring in SMEs and other organisations.

New internet-based technologies (often referred to as Web 2.0 and 3.0) support informal learning by simplifying work tasks and learning in groups. For example, online communities can share knowledge about how to resolve workplace problems. These technologies can also impact formal learning through their ability to support alternative approaches including problem and enquiry based learning.

While Web 3.0 provides more rapid development and deployment, and a greater ability to customise many SMEs are struggling to engage effectively with earlier technologies that do not allow customisation. SMEs should integrate their Learning Management Systems and Virtual Learning Environments with Web 2.0 technologies to create Personal Learning Environments. This would transform continuing vocational education and training into a social process because the Web 2.0 technologies allows learners to evaluate courses and exchange ideas and content which in turn improves the quality of the learning materials and products.

Communities of practice support learning by participants co-constructing knowledge and learning operating in a networked environment. Virtual communities of practice need to have adequate supporting technologies including weblogs, picture and message sharing, email, and voice over IP. Social media services and environments can be integrated into SMEs workplace e-learning through aggregation platforms.

A vocational e-learning strategy should contain the following:

- identifying the needs and objectives of the training
- engaging employees by aligning the e-learning training to their work
- ensuring sufficient time is allocated for staff to undertake the training
- courses and learning content that is focused on the core competencies that staff need
- tutor support for e-learning is integrated with traditional training methods
- learning infrastructures
- an organisational perspective is maintained and transfer of knowledge is supported
- establishing the requisite resources necessary to support e-learning
- establishing quality criteria and ensuring that user-friendly evaluation tools are available because SMEs and their staff typically lack the expertise and knowledge to conduct rigorous evaluations.

How do executives evaluate e-learning? A grounded theory study

Author: Hardt, P.

Reference number: 58

Year of publication: 2009

Introduction

The use of e-learning in corporate training is significant and growing. The American Society for Training and Development's[11] 2006 report noted in that year that about a third of all US corporate training expenditure was devoted to e-learning (US$39.33 billion). 60 percent of this expenditure was devoted to online delivery.

But the evaluation of this expenditure is imprecise with only about half of training programmes having any evaluation and less than a third measuring changes in organisational goals and profitability.

Methodology

The study's participants were selected by university students from organisations they worked for. These executives had to be at director level or above and not be responsible for training. Their organisations had to use e-learning as a significant component of their overall performance improvement strategy.

Telephone interviews were conducted, with interview questions adjusted to suit new approaches that prior interviews uncovered.

Key findings

There did not appear to be any differences in how e-learning and traditional delivery was evaluated. However, e-learning was reported as being thoroughly integrated into the organisations' human resource development and performance improvement strategies.

Training executives were wedded to the industry-standard Kirkpatrick model to evaluate e-learning, but finance or operational executives focused more on performance and business outcomes rather than learner reactions and satisfaction levels. Evaluations relating largely to learner satisfaction were seen as having limited value due to their subjectivity.

Stakeholders include those who can directly impact the evaluation process, as well as those with indirect impact (e.g. trainees, customers, boards of directors, and external advisors or regulators). The author proposed why and how executives evaluate e-learning:

- The values and goals of stakeholders influence the organisation's evaluation process, including the types of data collected and how this is interpreted.
- Stakeholder decisions when establishing accountability for e-learning includes their past experiences with e-learning (and training generally) as well as their business values.
- The maturity of the e-learning initiative can influence its accountability criteria.

Kirkpatrick's four levels evaluation model is now dated and has a number of flaws including:

- it is not based on, or supported by, research
- there is no empirical evidence linking its four levels to performance gains
- its 'upper' levels (three and four) are typically underutilised
- it leaves out too many important variables.

[11] They had at the time of writing changed their name to the Association for Talent Development

Heutagogy and e-learning in the workplace: Some challenges and opportunities

Author: Hase, S.

Reference number: 60

Year of publication: 2009

Introduction
Heutagogy is defined as the study of self-determined learning, meaning that learning occurs on the learner's, not the instructor's terms (this assumes that learners are independent and possess skills for self-learning and application of learning).

It proposes two levels of learning - the acquisition of skills and knowledge (competencies) and deeper learning which happens in unpredictable ways because it often occurs outside formal learning contexts.

Key findings
Self-identified knowledge and skill gaps can initiate learning with colleagues and 'teachers'.

Assessing learning and using it in projects relevant to the learner's work can increase their motivation and engagement.

The challenges with learner-led approaches include learners who are not experienced with negotiating learning, viewing learning as an interactive process, learning how to manage the training technology, retaining knowledge within the organisation, and trainers and facilitators having to relinquish their total control over the learning and its outcomes.

Communities of practice as well as intranets and related technologies could assist organisations to incorporate the sharing, discussion, development, and recording of workers' learning and content into their day-to-day work.

MOOCs come of age

Author: Herring, S.

Reference number: 61

Year of publication: 2014

Introduction
Companies are struggling to scale up traditional delivery approaches online that also incorporate more collaborative learning opportunities. The potential of Massive Open Online Courses (MOOCs) for corporations lie in the combination of scaling up expert-driven learning to global audiences with peer-to-peer collaboration.

Key findings
Core to the value proposition of a corporate MOOC is the integration of self-paced learning with peer-to-peer collaboration.

Some companies use MOOCs to provide training for their technology professionals. The certificate of completion is valuable for employees and saves companies the costs of developing a similar programme.

MOOCs can reach a global customer base and allow firms to interact with their key stakeholders. For example, SAP ran a MOOC on the topic of mobile software development on one of its platforms which attracted 40,000 learners from 158 countries. Its nearly 20 percent completion rate is much higher than MOOCs offered by tertiary education sector institutions.

Firms are building a variety of 'private MOOC' learning solutions for both internal and external partner audiences. MOOCs, in conjunction with traditional delivery allow partners to join when they wish and complete at their own pace. Learners watch instructional videos and self-study while instructors and other skilled tutors facilitate and curate personalised learning experiences.

Recommendations for firms considering adopting MOOCs include:

1) Clearly identify the business problem that needs solving and develop a MOOC value proposition that solves this challenge.

2) Develop a plan which includes a high-level learning design, learner support requirements, guidelines for tutors and facilitators, a marketing plan, a business case, and business model.

3) Ensure content is relevant and modular, and create meaningful opportunities for practice and application. Videos should be short (i.e. four to six minutes) and of decent quality. Challenge and enable learners to apply their MOOC experience to solve a practical challenge in their work environment.

4) Award badges to recognise learner mastery. Digital badges demonstrate the achievement of real skills. In addition they are verifiable and can be accumulated as recognition for a series of associated credentials. And over time, a badge helps to build an organisation's brand in an area related to the skills it badges.

5) Select technology that enables an integrated learning experience. The MOOC platform technology at minimum must be robust, scalable, and support the integration of self-paced learning with peer-peer collaboration.

6) Prioritise learner success and support services. Facilitation and support services should be used to promote and encourage interaction including regular feedback to learners as well as input from technical experts and regular, lively updates from course leaders.

7) Identify partners to help get started if needed. Organisations may find it helpful to work with other firms that offer integrated MOOC solutions.

E-learning in the corporate university

Authors: Homan, G., and Macpherson, A.

Reference number: 63

Year of publication: 2005

Introduction
While an increasing number of organisations are using the title 'corporate university' there is no consensus about what these consist of because they are created for varying purposes. However, these entities are likely to grow in importance with the UK Government at the time of writing considering giving them award-bearing powers. They are also important because the companies that support corporate universities tend to be large multi-nationals and are therefore likely to have a significant impact on the nature and direction of the education of the current and future workforce.

More recent corporate universities seek to make the best use of new technology for learning and adopt the structure of a virtual organisation

Methodology
This case study reviewed three large London Stock Exchange top 100 companies. One is a large bank, the second an aerospace industry participant, and the third a major telecommunications company. Interviews with senior and e-learning development staff were held, as well as seminars with academic practitioners from two of the organisations and consultancy in the third. A review of the organisations' e-learning materials was undertaken and. this was compared and contrasted with the interview, seminar, and consultancy data.

Key findings
E-learning is making learning widely available, contributing to an organisation's learning culture, and the delivery of new projects as well as management development which in turn plays a key role in simulating the 'intellectual engine' of the organisations.

The case study organisations are all using e-learning to support virtual communities in the shape of online forums which provide extended interaction by building a database of learning information and past experiences (aerospace), by delivering strategic management qualifications and key projects (telecommunications), and to support their change initiatives and projects (the bank and aerospace).

Technology does not shape the approach of the corporate university. Its use is dependent on the strategy adopted by senior and human resources staff.

The decisions by the case study companies to implement e-learning were significantly dependent on its potential return on investment. However there are risks of this emphasis hampering the effectiveness of e-learning solutions.

E-learning's role should be seen in its contribution to a firm's competitiveness and learning culture. Corporate universities can use e-learning to centralise company-wide learning strategies that address organisation-wide needs, but how e-learning might contribute to bottom line performance was unclear. In some cases the organisations' base technologies meant the learning materials were not interactive, nor were they sufficiently different from other distance learning materials. Generic and customised materials can be sophisticated and well designed, but the time and cost necessary to achieve this are a barrier to their realisation.

In all organisations the learner experience is absent from discussions. Only when corporate universities address all issues relating to the learner experience and learner responses will they be in a position to claim that e-learning makes a significant contribution to their corporate university's strategy.

Cross-disciplinary contributions to e-learning design: A tripartite design model

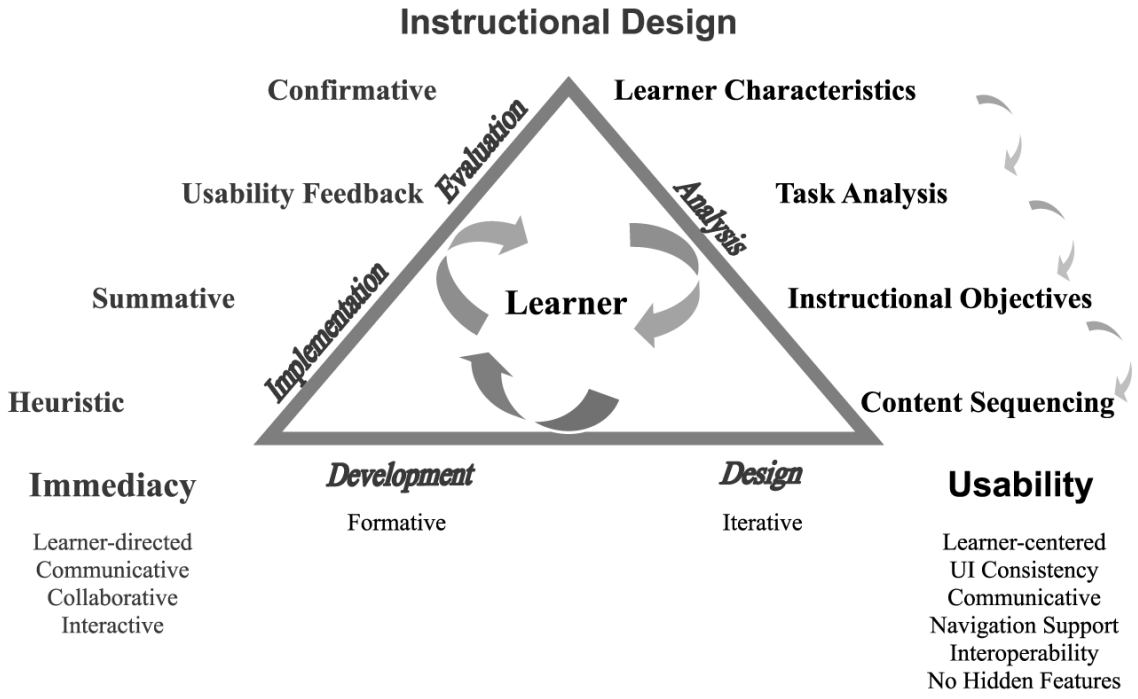
Authors: Hutchins, H. M., and Hutchison, D.

Reference number: 64

Year of publication: 2008

Key findings

The authors proposed an e-learning design model shown in the diagram below.



Of importance in this model are the learner's technology skills and the organisation's technology infrastructure. Organisations also need to ensure that e-learners are supported (by providing sufficient time for participation and reflection on the learning).

Designers and trainers also need to use creative processes to continually review and improve e-learning programmes. Trainer skill sets required to teach in e-learning environments include being able to use the organisational Learning Management System, applying techniques for encouraging interaction, and developing instructional materials.

Learners should be provided with greater control and different learning pathways based on their skill level or learning style, remedies and support to rectify errors, and clear linkages to their individual needs and requirements.

Because e-learners are often remote from other participants, it is important that they feel that their instructors are present, or that they are supported by virtual learning communities.

Evaluation factors should include the scope of the evaluation, the role of stakeholders, timing of the evaluation, user experiences, internal development and management processes, collection methods to use, assessment metrics, and how the results will be used.

Development focus: Why e-learning is far from boring

Author: Jones, M.

Reference number: 67

Year of publication: 2014

Introduction
Some experts predict that e-learning will constitute nearly the entire workplace learning market by 2020. But its predominant use is to support compliance training which means that e-learning is generally regarded as a 'necessary evil'.

Key findings
E-learning can do much more than simply support 'tick the boxes' compliance training. Through mobile learning (m-learning) delivery platforms (including specialist apps) even compliance training can be more just-in-time and relevant than is currently the case. The expectation is that workplace e-learning opportunities will be available '24/7' through m-learning and existing company ICT infrastructure.

M-learning is supported by video that provides small 'chunks' of content as and when needed. This is a proven means of reinforcing and embedding learning. Learner engagement can be increased through the use of interactive gaming approaches which should include alternative accreditation like badges as a means to provide tangible rewards and incentives.

Online academies as well as learning and development platforms allow for more personalised learning. Advanced diagnostic and content creation and management tools are supporting the development of robust developmental programmes that promote individual career progression and enhanced professionalism.

The latest content creation tools that are integrated into learning and development platforms are providing firms with an efficient, simple way to create high quality, customised, and relevant training experiences. These tools allow continual updating of content by the organisation's own subject matter experts. E-learning also captures all of an employee's training in a portable form which is useful for career advancement and obtaining new employment.

Tapping into social networking: Collaborating enhances both knowledge management and e-learning

Authors: Kane, K., Robinson-Combre, J., and Berge, Z. L.

Reference number: 68

Year of publication: 2010

Introduction

By using Web 2.0 social networking tools (including weblogs (blogs), podcasting, social networking tools, and wikis), organisations can combine knowledge management and e-learning for more effective training and knowledge sharing. Knowledge management benefits an organisation by using their employees' intellectual capital. E-learning is an effective dissemination mechanism for an organisation's knowledge. Social networking sites also share real life knowledge and experiences, which can be incorporated into workplace e-learning to create real-world case studies and examples to support the concepts being taught.

Key findings

Social networking tools support adult learners and self-directed learning because they allow them to have a say in what they share and what they seek out. They are active in their own learning by participating in collaborative sites that allow them to share information they deem important and worthy of their attention.

With the use of knowledge management repositories and social networking sites, learners are able to tap into information (provided they have computer access) to solve just-in-time problems without waiting for formal training modules. Content developed needs to be practical and relevant to an employee's actual work situation. Communities of practice can help identify the learning needs and resources of a specific group, provide subject matter content, and evaluate the training.

Learning objects developed through knowledge management processes can be revised and reused which reduces duplication and course development time. Tying knowledge management to e-learning personalises training by allowing the creation of course modules that incorporates tested knowledge from real people.

Social networking tools do not replace structured training which is necessary to deliver content, measure performance, and track compliance; rather social media can be used to collect knowledge and information to incorporate into formal e-learning.

Social networking tools could be used to customise employee orientation programmes so they are better aligned with their actual work areas and this personalisation could also apply to ongoing employee support, for example locating subject matter experts or seeking mentors. Social networking tools can also capture valuable information arising from post-course dialogue.

Organisations should consider using wikis and Twitter. Wikis support just-in-time learning and allow active knowledge sharing. Twitter threads allow users to see answers and solutions to their problems. Organisations can collect 'tweets' to sort, categorise, and share. An employee can also use Twitter to follow a mentor, connect to experts, test new ideas, and maintain post e-learning course discussions.

Instant messaging conversations about problems could be stored and then re-used in a company blog, to share a final solution, and allow the process used to arrive at the solution to be captured and incorporated into a formal e-learning module.

Web-based expertise dictionaries, knowledge sharing forums, and centres of excellence can all complement e-learning.

Understanding e-learning 2.0

Author: Karrer, T.

Reference number: 69

Year of publication: 2007

Introduction
Workplace learning is being affected by Web 2.0 interactive technologies (for example weblogs (blogs), wikis, and social networking sites). The key components underpinning Web 2.0 technologies are that anyone should be able to easily create and contribute content on the internet. Web 2.0 technologies allow information to be easily obtained from peers and experts.

Key findings
Web 2.0 tools can make relevant web content widely and easily available to large numbers of dispersed learners.

Public blogs can be used to garner feedback on how e-learning can be incorporated into future strategic plans.

Wikis can be used to create a shared resource that can be edited by entire teams.

RSS feeds can be used to largely eliminate email because it becomes the single place for team members to visit to keep apprised of current developments. The interactions associated with these feeds can lead to the creation of networks that help individuals learn and problem solve.

E-learning 2.0 (e-learning which primarily uses Web 2.0 technologies and tools) is also supporting formal learning. For example wikis can support group projects; blogs can be used to submit assignments and offer the opportunity for peers to provide feedback in a collaborative learning setting; and social bookmarking tools can be used as part of collaborative research.

E-learning 2.0 combines access to content, which often derives from the work of employees of small and medium-sized enterprises, with access to peers through social computing models. Many people cite the social or network effect as providing the greatest opportunity for impact on learning.

E-learning 1.0 (e-learning which primarily uses older technologies and tools) is likely to continue to be used for content development where there is a relatively large audience with common, identifiable needs who have relatively the same level of knowledge around the subject matter, or where there are compliance issues, high cost of errors, or significant up-front training is required.

E-learning 2.0 makes the most sense when there is widely different learning needs or content and specific learning needs are unknown until during the training development process.

Effectiveness of virtual reality based immersive training for education of health professionals: A systematic review

Author: Karunasekera, P.

Reference number: 70

Year of publication: 2011

Introduction
Recent technology advances have made a wide set of innovative virtual reality (VR) training tools available to health professionals, in addition to historical use of mannequins. VR technologies use specialised hardware and software (which include both video and audio functionality) to achieve high degrees of realism and authenticity. VR not only brings variety, but addresses those areas where traditional delivery is weakest, for example gaining appropriate experience in clinical contexts.

Methodology
A literature review covering 2000-2009 across specialised databases was conducted to assess the effectiveness of VR training for improving clinical expertise. Then effective VR tools for health professionals were identified and listed.

Key findings
Medical simulations allow students to learn procedures and treatment protocols before using them on actual patients, thus correcting mistakes and fine-tuning skills to help optimise clinical outcomes and enhance patient safety. The ability to stop and start, with or without mentor direction, and repeat practice is also seen as a benefit.

Learners also gain experience with patients and cases they may not actually encounter during their day-to-day practice, and VR allows them to bypass ethical, financial and practical inadequacies associated with live patient training.

Simulations range from a relatively unsophisticated reproduction of basic body parts to more complex human interactions delivered by high-fidelity human patient simulators.

VR technologies are useful in a wide range of areas including remote and local surgery, treatment of phobias and other causes of psychological distress, emergency and disaster response training, and more recently physical and psychiatric rehabilitation and, to a lesser extent, diagnosis

Further benefits are the reduction in course material development time and costs and a greater ability to reuse them, and the ability to accurately measure performance against others so that entirely objective assessments of psychomotor skills are possible.

A 2008 meta-analysis by Gurusamy, Aggarwal, Palanivelu, and Davidson found that for trainees without surgical experience, VR training decreased the error rate and time taken to complete a task, and increased accuracy compared to those who received no training. These were increases over standard video training when the trainees had limited surgical experience.

However, there remains scepticism within the wider medical community, and a lack of well controlled clinical trials and medical education research demonstrating improved performance in surgical procedures.

Leveraging Web 2.0 concepts to create an open and adaptive approach to corporate learning

Authors: Lee, H., Tsui, E., and Garner, B. J.

Reference number: 73

Year of publication: 2008

Introduction

The delivery of training through a Learning Management System (LMS) has traditionally been 'top down' where corporate management specifies and designs courses that they think are best for their staff. But this one-size-fits-all approach is no longer appropriate for today's employees and business environments.

Key findings

Corporate e-learning needs to be adaptive, productive, and scalable. Adaptability is not just about personalising learning but ensuring the content can meet requirements in the appropriate context. This is best supported by reusable learning objects.

An object-oriented instructional design strategy breaks down instructional content into discrete learning objects (LOs), embeds metadata into LOs so they can be easily stored and located, and avoids being too specific so they can service multiple contexts. Content and LOs can be created by subject matter experts, but they need to be accurate, current, and relevant.

LOs also need to be classified in ways that are useful to employees. There are specialist tools that can create taxonomies and vocabularies, or alternatively user-generated 'tags' (keywords or concept terms that describe the LOs) can be used to support a more organic approach. This user-generated approach is cheaper and more scalable than the alternative approaches, but is subject to the taggers' interpretations and often results in differing levels of specificity.

A collectively tagged corporate LMS would become a low-cost 'social' LMS, which should be supported by a number of key measures including:

- Ending anonymous contributions. This can increase quality because it will make the user accountable for achieving it.
- Improve classification through the use of emerging tools.
- Implement social networking as a side benefit. Those who contribute to the development, maintenance, and improvement of LOs can form learning communities of practice which is very useful for large, dispersed workforces and also enhances corporate knowledge sharing and collaboration.
- Selectively open the LMS to channel partners and customers for non-confidential material to extend the corporate learning community as well as creating higher value content and promoting greater trust between a firm and its partners and customers.
- Extend the system into a personalised LMS. This type of LMS can support user development of personalised instructional content in real-time or send instructional content to users periodically according to their updated profiles.
- Create critical mass. Tutors should convert current instructional content for use on the new system, which is then stored and retrieved when another learner's profile matches it.

Smart learning adoption in employees and HRD managers

Authors: Lee, J., Zo, H., and Lee, H.

Reference number: 74

Year of publication: 2014

Introduction

Companies are increasingly relying on e-learning and mobile or m-learning to support their workplace learning. M-learning is now evolving into 'smart learning' enabled by devices such as tablet PCs and smart phones that allows workplace learning to occur anywhere at any time. These devices also support learner-centred approaches by enabling collaboration and communication. However, they are restricted because they can only deliver PC-based content.

The important consideration in smart learning is the implementation of the supporting system. But smart learning is more than devices; it is learning in an interactive, intelligent, and tailored learning environment that is based on advanced technologies and services such as context-awareness, augmented reality, and cloud computing.

Human Resource and Development (HRD) managers have been largely ignored in existing workplace e-learning research. Including their perspectives is important because ultimately they determine the types of training and the associated delivery modes companies employ to support their workplace learning.

Methodology

The study adopted a framework based on the technology acceptance model with the key variables of perceived usefulness, perceived ease of use, mobility, interactivity, personalisation, and collaboration. For HRD managers the focus here is on whether smart learning improves a firm's overall performance. The authors used surveys and questionnaires to collect data.

Key findings

Smart learning was perceived by managers and employees as being both useful and easy to use. Smart learning being viewed as both useful and easy to use was more likely to occur when it facilitated personalised learning. The usefulness of the learning environment rather than how easy it was to use was more important for employees than managers in regards to whether smart learning was adopted. The opposite was the case for managers.

Mobility was more important for managers than employees in regards to their perceptions of ease of use. Interactivity was only important for managers in regards to their perceptions of ease of use. These findings suggest that companies should focus their efforts on increasing the usefulness of smart learning environments rather than their current emphasis on making them easy to use.

Mobile learning: Should we get a move on?

Author: Lee, M. J. W.

Reference number: 75

Year of publication: 2005

Introduction

The tools that support mobile learning (m-learning) are typically small, portable electronic devices with computational capabilities including mobile phones, laptops, and tablets. Mobile devices are becoming an increasingly important component of workers' daily lives.

Key findings

M-learning can deliver text, audio, and video in discrete components to support just-in-time learning for a distributed workforce. For example, workers in a range of off-work contexts can access relevant information in real-time to support their particular tasks.

Learners can capture a range of scenarios and tasks through their mobile devices in a variety of formats (audio, text, and video for example) and share these with their peers and instructors. Learners can also access mentors through their mobile devices. Mobile devices can be used to form informal networks that in effect bring the classroom to trainees.

However, even without these restrictions m-learning has other equally important challenges to deal with; most notably the small screens and keyboards which many think hinder effective learning as well as discouraging deep thinking and critical reflection. This may not be effectively resolved until new technologies become more widely available. In an Australian context, it has been suggested that m-learning is being hindered by the practices of its major telecommunications companies, particularly the costs and lack of interoperability.

But it is likely that m-learning will be adopted because of its ability to provide informal learning opportunities at a time and place of the learner's choosing.

To be successful in m-learning, the m-learner must not only be self-directed and independent, but also 'learn how to learn' through an awareness of basic adult learning theory and have an ability to structure their learning experiences to suit their own individual learning styles and preferences. They must also be able to operate and move effectively between different media and constantly multitask so that learning becomes seamlessly intertwined with their other activities.

Scaling informal learning at the workplace: A model and four designs from a large-scale design-based research effort

Authors: Ley, T., Cook, J., Dennerlein, S., Kravcik, M., Kunzmann, C., Pata, K., Purma, J., Sandars, J., Santos, P., Schmidt, A., Al-Smadi, M., and Trattner, C.

Reference number: 78

Year of publication: 2014

Introduction
Despite the recognised importance of informal learning most workplace e-learning supports formal learning. Scaling up informal learning through e-learning requires managing learning and learning support simultaneously from the individual and organisational perspective.

There are several options that can be employed which would allow e-learning to support a scaling up of informal learning. Organisations could introduce adaptive learning technologies and systems which facilitate self-regulated learning and allow input and support from more expert peers.

Social networking tools and online communities of practice allow the co-development of informal knowledge as well as its codification so it can be used in formal learning contexts or to support organisational business processes. Finally, semantic technologies can be used to link internal or tacit knowledge with external resources to support workplace learning and business activities.

Methodology
This study used interviews, focus groups, and visits to staff in their workplaces.

Key findings
The researchers developed PANDORA to bridge the gap between formal and informal knowledge. PANDORA supports professional conversations in personal learning networks alongside the guidelines (developed to support General Practitioners) and it can also notify users about changes in specific guidelines. PANDORA tracks the professional conversations and based on these makes recommendations to General Practitioners (GPs) for other conversations, documents, or trusted experts.

But it was difficult for the GPs to assess the usefulness of the conversations and other materials. And they often were dubious about the origins or sources of the conversations and materials which hindered their uptake. They also lacked time to effectively participate and engage with the conversations and materials.

Tools such as Google Keep can be used to capture internet-based informal learning experiences. PANDORA complements these tools by allowing users to retrieve and make sense of the captured materials at a later stage through connecting the time, place, topic, and person to the collected pieces of information. This supports existing practice where often health care professionals collect notes so they can be attended to at a later date.

These individual chunks of knowledge can be made more widely available through social networking technologies and online communities of practice. This also allows for the materials to be further revised.

The authors also developed a Social Semantic Network and services which is based in the cloud and provides common services like sharing and tagging. It tracks all activities with the systems and tools in order to generate more meaningful connections between individuals, conversations, and resources. In addition it can be used to discover patterns which in turn are utilised to recommend experts, conversations, and resources related to the current problem.

Competency - and process driven e-learning - a model-based approach

Authors: Leyking, K., Chikova, P., and Loos, P.

Reference number: 79

Year of publication: 2007

Introduction
One of the main reasons for the lower uptake of e-learning by workplaces is that it has little significance for individual and organisational learning needs, and is often irrelevant for daily workplace tasks. In addition the time lag between the acquisition and application of knowledge is too lengthy. If e-learning is not integrated into organisational and individual needs and requirements it is very likely to fail.

Key findings
Using technology tools to embed learning within daily work tasks is a key enabler of business process change and improvement.

A business process lifecycle has three steps: modelling them according to business requirements; implementing the processes into software systems; and then using these software systems to automate the business activities with data used to inform the next improvement cycle.

As this process lifecycle has become the key to business management, it tends to be the driver for process-driven learning management as well. A business process model defines the necessary organisational and individual competencies.

The continuous enhancement of employees' competencies is an important precondition for process optimisation. Improved competencies enables improved readiness for business tasks, faster decision making, better response times to stakeholders, and higher levels of customer satisfaction. Competency gaps can also be identified in a much timelier manner.

The ability to link and automate business and learning processes means that business and learning systems can be combined to achieve key objectives including:

- **Learning needs identified at the point of action**. This helps close the competency gap and improve an individual's performance in the process.
- Information and explicit knowledge generated and used by business processes **can be directly transferred to authoring systems to develop content** instead of being laboriously collected after the fact.
- Personalised, adapted learning activities are integrated into ongoing business tasks and challenges.
- The impact of accomplished learning processes on business process performance **can be closely measured**, compared to business goals, used to inform future training design, and ranking available learning objects for that business context.
- Innovative methodologies supported by appropriate infrastructure and tools are critical if these objectives are to be achieved.
- Technology can deliver the right learning to the right learner at the right place and time.
- Measurement of the impact of learning and training on the execution of the organisation's business processes needs to be part of the organisational key performance indicators to ensure that an accurate return on investment can be obtained.
- The identified cause-effect relations can provide feedback to the appropriate business process on the performance of each employee.

Applying ‘scruffy’ methods to enable work-integrated learning

Authors: Lindstaedt, S. N., Ley, T., Scheir, P., and Ulbrich, A.

Reference number: 80

Year of publication: 2008

Introduction
Although much workplace training expenditure is devoted to formal knowledge transfer to improve workplace performance a significant amount of knowledge transfer occurs informally (or via ‘scruffy’ methods).

Key findings
Informal learning typically occurs through face-to-face interactions with colleagues and searching digitally documented sources. Work-integrated learning has the following characteristics:

- individuals are responsible for their own competency development
- individuals are enabled to work within their own specific work processes and context and wider organisational environment (including its ICT infrastructure).

Personalised e-learning can mean the competency level being targeted (i.e. novice to expert) or differing interactivity levels set. This is why e-learning content is often expensive to create, requires extensive metadata standardisation, and needs significant organisational structure.

Newer approaches focus more on flexible delivery and particularly timeliness so the e-learning is related to work processes and tasks as and when they occur. The downside of this approach is lower accuracy and sub-optimal course design. While there are accuracy issues with this hybrid approach it is argued that users are forgiving of this concept and its accuracy flaws because of their familiarity with web-based search engines

Hybrid approaches aim to reuse existing organisational content which may not have been created with training in mind. Traditionally structured resources are improved over time by ‘scruffy’ methods of user data and feedback informing user needs and the support required. User data also includes usage data, inferred data, and environment data. This allows for the clear separation of factual data from assumed information about the user.

Environmental data, while not directly related to users and not stored in their profile, has a large bearing on work task execution and performance. For example, mapping between tasks and learning goals can be used to interpret user profile data. The users’ task data is further informed by user profiles considering their personal work, learning, and collaborative experiences.

A comparative study on e-learning technologies and products: From the East to the West

Authors: Liu, Y., and Wang, H.

Reference number: 82

Year of publication: 2009

Introduction
Knowledge management is the process of collating and using an organisation's knowledge.

Modern knowledge management system technologies (for example, business intelligence; content, document, and customer relationship management; and e-learning) are becoming increasingly important. Of these, e-learning has emerged as a viable solution because it can support continuous, on-demand training that is less expensive than traditional approaches.

This summary will only focus on the 'western' jurisdictions (included at the front of this bibliography) not the Chinese or other 'eastern' jurisdictions also examined as part of this study.

Key findings
The emphasis of workplace e-learning is shifting to 'performance support' by integrating knowledge management and e-learning capabilities. E-learning provides the supporting tools and technologies while knowledge management is the operational platform of e-learning systems. Knowledge management oriented e-learning is the tool that transforms tacit knowledge (informal organisational and staff knowledge) into explicit (formal documented) knowledge.

Feedback from e-learning also contributes to the maintenance of knowledge.

The critical success factors identified for workplace e-learning were:

- **organisations**: flexibility in management, control mechanisms, communications, and the establishment of culture and mutual trust
- **individuals**: instructor's attitude, active employee participation, and learners' motivation
- **technology**: having an internet environment and deploying advanced technologies
- content and services

There are a range of technologies and web-based environments which support workplace e-learning, including DVDs, computer conferencing, e-mail, and wikis as well as infrastructure and systems such as wireless networks, portals, KnowledgeTree, and LiveNet. 'Languages' to support this are DHTML, XML, and VRML.

E-learning products that can effectively support organisational knowledge management include the Linux operating system, eTraining, and Siebel Distance Learning (which supports automated content management and measures learning and course content delivery), TrainNet, and Vuepoint Learning System 3.0. But most importantly organisations need a Learning Management System.

Employees may lack the confidence and capability to effectively engage with e-learning training solutions. Collaborative e-learning underpinned by peer-peer and peer-content interactions can address this problem. But this will need advances in the technology so it can support more effective interpersonal communications.

E-learning systems will be more effective if they can train employees in soft skills and technical knowledge. E-learning systems also need to support independent learners and those who require more interaction. Standardisation of e-learning resources will address the problems caused by mismatches between cost, manpower, and resources. It will also ensure that these resources can easily be shared and reused across the organisation's different operating systems. To do this, system development needs to be modular and planned.

Competency management systems and technologies

Author: Liyanage, S.

Reference number: 83

Year of publication: 2007

Introduction
One of the challenges workplace e-learning faces is to adopt methods and approaches that are suitable for the diverse experiences and capabilities of employees'. But its major challenge is to convert content into learning experiences that are relevant to employee and organisational needs. It is also necessary to supplement workplace e-learning with real life experiences to make learning relevant and appropriate.

Key findings
Knowledge bases need to be continually updated, verified, and subject to scrutiny by both learners and instructors. There is also a risk in interactive e-learning environments of an overabundance of material.

Communication protocols between learners and instructors need to be established before effective e-learning can occur.

Simulation games can be used to support team and group development and build collaborative learning.

E-learning needs to be carefully managed and structured according to the employee's cognitive needs and the organisation's development requirements.

As learning concepts become more complex, the supporting technologies need to develop multiple functionality and increased accessibility and interaction.

Enhancing just-in-time e-learning through machine learning on desktop context sensors

Authors: Lokaiczyk, A., Faatz, A., Beckhaus, A., and Goerta, M.

Reference number: 84

Year of publication: 2007

Introduction

The APOSDLE[12] project intends to develop a software system that will unify all the relevant systems supporting knowledge management and other business tasks. This will support informal learning and the creation of user-generated content to save costs and ensure learning materials are current and relevant. The applicability of traditional machine learning algorithms for addressing this problem is the basis of this study.

Key findings

APOSDLE's task predictor's goal is to know the active work task of the user at any point in time. This is done automatically by software 'agents' referred to here as context sensors using relevant terms that are highly correlated to the work task.

APOSDLE monitors the user's activities to assess which training materials they need. Ideally users will not need to notify APOSDLE when they switch tasks and whatever task they are on, APOSDLE will automatically provide the appropriate e-learning materials.

One of the challenges in this machine-generated approach is whether it can effectively generalise and not provide extraneous information and materials. Support Vector Machines were adopted to address these problems, with a trade-off between extraneous information and too much generalisation. Decision-trees and rule-based algorithms were also adopted.

The APOSDLE environment needs to be unobtrusive to the user, align with their work tasks, have low memory and process usage, and fit into a Microsoft operating environment.

The authors tested the developments on users carrying out common business tasks including market analysis, product design, and specification and found that the algorithms did not work well when there was a paucity of suitable training materials. Longer 'windows' where more training materials can be made available is the most effective for all the algorithms.

The filtering system had little influence on the overall accuracy. Only the decision tree and learner algorithms could make use of this information. The 'chunking' of information into file name parts and sub-directories was beneficial but not statistically significant.

[12] The Advanced Process-Oriented Self-Directed Learning Environment project is funded by the European Commission

Web 2.0 support for individual, group and organizational learning

Authors: London, M., and Hall, M. J.

Reference number: 85

Year of publication: 2011

Introduction
Web 2.0 applications include social media, video conferencing, aggregated searches, weblogs (blogs), chat rooms, and wikis. Web 2.0 technologies can be combined with traditional delivery, webinars, and problem solving experiences to support corporate training for geographically dispersed teams that addresses actual business requirements.

Key findings
Web 2.0 technologies do present some challenges, including working collaboratively to align learning with strategy. However, they also have benefits including decreased travel costs, greater flexibility by providing self-paced training options at a time and place of the learner's choosing, and being more engaging through incorporation of demonstrations, games, and real-time interactions with peers and experts.

Web 2.0 technologies support both adaptive learning (memorisation, demonstration, practice, and feedback on standard skills, knowledge, policies, and procedures) and generative learning (learner-driven and peer-peer engagement in inquiry and collaborative problem solving). An example of generative learning is via simulation which provides feedback, peer and instructor input, and the ability to repeat the practice

Learning communities emerge as individuals discuss content and teach and provide feedback to each other. Technologies that support these communities include chat rooms, blogs, wikis, and social media. Software can also track task progress, provide resources and information, and maintain task focus.

Web 2.0 technologies support organisational learning by blending work and learning, alleviating cross-functional and cross-cultural differences (e.g. managing multinational companies' global supply chains), and supporting business transactions.

They also allow organisations to calculate the return on their technology investment. For example, the organisation can track the speed of systems' integration and application to individual and team operations. Learning software needs to take into account learner capabilities (i.e. their backgrounds and prior learning) and organisational resources.

There needs to be continuous assessment of new software and capabilities relative to the cost of adoption, change, and sunk investment (initial as well as upgrades), with caution about reliance on any one single vendor. Learning professionals, executives, instructional technologists, executives, and organisational change and development professionals, need to understand their changing roles as facilitators of organisational learning and capacity. This includes encouraging experimentation with new software.

Identifying the organisational champions who are first adopters and facilitate learning for others will help to demonstrate a culture of sharing and innovative practice that produces results for the organisation.

Learning environments for mobility

Author: McKey, P.

Reference number: 90

Year of publication: 2011

Introduction
While the corporate learning and development community are keen to embrace mobile learning, the associated support and resources may not be in place because many organisations do not see learning as strategic. And are the current organisational systems able to support this type of learning without wholesale redesign?

Key findings
To attract sufficient investment, learning must be aligned with strategy. The majority of organisational e-learning is incremental which reuses or adopts existing knowledge and is inadequate to support the development of new knowledge by individuals or groups.

The Learning Environment Maturity Model (LEMM) designed specifically for corporate e-learning has five stages:

- Passive - has little interaction and typically uses web-based resources and email. Valuable for organisations or units focused on operations where skills, systems, and compliance training are critical. This requires heavy investment in processes, systems, and training resources.
- Transactional - based on static data such as learning assessments and simplistic e-learning courses.
- Interaction - where organisations transition from mass to niche courses, public to personal, and generic skills to individual performance, underpinned by Web 2.0 technologies, social networks, and serious games.
- Experiential - where system control is ceded entirely to the user and is underpinned by high-end role play, augmented reality, and simulated practice with a focus on problem-solving and modelling. Typically used by high performance teams to develop autonomous learners.
- Autonomous - where learners are entrepreneurial and opportunistic and operate quickly and instinctively. Sophisticated systems support that can manage extensive knowledge networks is critical to allow full user control, customisation, and privacy

Developing mobile applications for passive and transactional environments adds little to their overall effectiveness.

But given the right conditions, building quality, device independent, and future-proof mobile learning systems is possible and the author recommends a book by Clark Quinn (2011) titled *Designing mLearning – Tapping into the Mobile revolution for Organizational Performance* to achieve this. Incorporating and adapting a framework like the LEMM can be used to convince organisations that learning can be strategic and support competitive advantage. Where this can be proven the necessary funding is likely to follow.

Remarks on ubiquitous intelligent supportive spaces

Author: Mikulecký, P.

Reference number: 92

Year of publication: 2009

Introduction
The increasing maturity and implementation of intelligent technologies can make a valuable contribution to workplace development, especially the ability to support knowledge management which in turn can help solve complex work problems. To be successful, these intelligent technologies need to be adopted alongside knowledge management approaches.

Key findings
A 'smart' space underpins the design for e-learning environments and includes dynamic learner profiles which contain their learning history and goals as well as more specific learner information.

Smart space technologies include sensors, actuators, and computing components. These technologies interact and influence each other and are evolving rapidly due to advances in, and uptake of, the internet.

Smart spaces also more effectively support managerial decision making, including decisions relating to:

- user authentication and sign-in
- context-based services, customisation, personalisation, and omnipresent monitoring
- application of new programming principles and intelligent environment algorithms
- innovative hardware and new devices
- intelligent interfaces that process implicit inputs and interactions
- support of intra-community communication
- new types of smart learning objects
- invisible file systems
- affective computing
- privacy issues
- interaction of intelligent environment sub-systems.

Key technologies associated with knowledge management, artificial intelligence, user interfaces, and communication and network services should all be adopted. But when adopting these technologies organisations need to consider security and protection of data and information.

Interactions between intelligent environments and people raise a number of issues. These include the interactions among the 'participants' in the intelligent environment as well as their human counterparts, the levels and types of these artificially intelligent entities, and potential conflicts between intelligent environments and people as well as the ethical issues raised.

To resolve these it is critical that the emerging behaviour of the intelligent environment communities is geared towards serving human purposes and requirements; ascertaining how any conflicts between intelligent environments and humans are resolved, and ensuring individual privacy is protected so that people do not feel that they are interacting with some sort of mass surveillance environment.

Generating satisfaction towards e-learning platforms

Authors: Moreno, M. R., Moreno, R. R., and Molina, C. M.

Reference number: 95

Year of publication: 2013

Introduction
E-learning allows employees to participate in interactive training programmes that would not be possible otherwise. But despite the benefits employees do drop out or in some cases do not even enrol in workplace e-learning courses.

A key determinant of uptake and engagement is how satisfied employees are with the e-learning experience. As employees' expectations are met, their positive attitude towards the e-learning platform increases.

Methodology
This study's employees were from small and medium-sized enterprises. This study's data was based on two questionnaires (one pre-course and the other during it). They had 495 responses to the first questionnaire, 175 for the second, and 133 did both. They used specialist modelling and software to analyse the data.

Key findings
Expectations on the usefulness of an e-learning course and how much effort is required to use the e-learning platform impact significantly on learner satisfaction once the course is completed.

However, expectations about the organisational and infrastructure support or social influence (influence by others) had less effect on learner satisfaction.

The results confirm the importance of establishing expectations prior to use because users adjust their perceptions of the experience to meet their preconceived expectations as well as the operating reality of the environment which they find themselves in.

Organisations should focus on promotion and communication of the e-learning, highlighting the characteristics and functions provided by the platforms.

E-learning vendors should focus on providing platforms with functions and features that exceed users' expectations.

Employees' perception of managers' support and active assistance has a significant effect on the perceived usefulness of the e-learning system, as does the perception of organisational support.

The higher the expectation that e-learning is useful to improve work performance, the higher the motivation is to use it.

Corporate e-learning should be designed and distributed in such a way that it enables participants to integrate their knowledge, practice, and experience with their theoretical or conceptual knowledge.

Design characteristics of virtual learning environments: An expert study

Authors: Mueller, D., and Strohmeier, S.

Reference number: 96

Year of publication: 2010

Introduction
As virtual learning environments (VLE) are increasingly externally purchased, the design characteristics outlined in this paper can act as selection criteria for these external systems. They also offer suitable evaluation criteria for already established systems.

Key findings
The final list was 16 design characteristics across system- and information-related categories, in sequence of importance:

System-related:
- Reliable: where learners can apply it without technology related disturbances.
- Secure: where key data such as the learner's profile, history, and outcomes cannot be modified by the system or other users.
- Supporting the learning process: where relevant materials are supplied that are just-in-time and help facilitate collaborative activities.
- Interactive: where the VLE supports learner-system, learner-learner, and/or learner-teacher interactions and collaboration.
- Appealing: where the graphic user interface has a pleasant appearance.
- Transparent: where learners can monitor their own and/or others learning history and current status in the learning process.
- Structured: where learners can quickly detect the allocated information and easily navigate the graphical user interface.
- Supportive of standards: where the VLE conforms to e-learning standards such as IMS Learning Design and SCORM (Shareable Content Object Reference Model)
- Accessible: this is where learners can access it according to their own requirements.
- Platform-independent: where the VLE can run on a wide range of operating systems.

Information-related:
- Understandable: where the learning materials are clear in their meaning and easy to read and comprehend.
- Consistent: where the learning materials are without contradictions as well as being coherent and presented in a logical order.
- Credible: where the information provided originates from a trustworthy source.
- Challenging: where the learning materials contain difficult but interesting tasks which stimulate learners' curiosity to solve them.
- Multimodal: is where the learning materials are presented in different formats including text, audio, and video.
- Enjoyable: is where the learning materials make the learning experience more pleasant.

Serious games: Learning for the *i*generation

Author: Neill, T.

Reference number: 99

Year of publication: 2009

Introduction
In a very short space of time employees have been expected to take responsibility for their own learning. As a result, self-paced 'e-learning' programmes have replaced many traditional delivery courses. But are these e-learning courses effective? The young and upcoming generation of employees, the '*i*generation', will likely want to learn by playing computer games.

Methodology
For the purposes of this article, serious games are those that are aimed at training and assessment in specific tasks. A serious game immerses the learner in a virtual, yet familiar world in which they can experiment, ask for help, and refer to documentation. This article excludes games from Second Life and other virtual, social worlds as well as simulations such as those developed for military training.

Key findings
Serious games are a much more reliable and effective way to demonstrate competence than a multi-choice test.

Serious games are also a cost-effective way for learners to complete hazardous or inaccessible tasks (for example dealing with a fire using supplied fire extinguishers or driving new underground trains). The level of support provided can be learner-led with novices getting as much assistance as they need while experts may not get any.

The real value of serious games lies in the fact that learners can apply new knowledge and make decisions using their best judgement, whilst receiving expert guidance.

In no particular order the critical components of effective serious games are: realism, setting job-relevant tasks, challenging the learner, immersing users immediately in the environment and task(s), letting experts excel, giving hints and tips, providing reference material and continuous feedback on performance, recording and reporting actions and outcomes, and including the unexpected.

In the future there will be far greater use of serious games through small 'chunks' of interaction provided via mobile devices and a maturing of virtual environments such as Second Life. Better ICT infrastructure will support improved graphical imagery and organisations will develop or purchase more customised game environments.

In particular, the potential for multi-department, role-playing activities is significant with online expert guidance during the game and the possibility of recording actions and behaviours for post game review and discussion.

E-learning maturity in the workplace - the benefits and practices

Authors: Overton, L., and Hills, H.

Reference number: 106

Year of publication: 2010

Introduction
The e-learning maturity of users progresses from the Novice to the Sporadic User, to the Developing User, to the Established User, to the Embedded User, and finally the Innovator. This study found that Established and Embedded Users only appear after experience of using e-learning for three or more years.

Methodology
An online survey targeted those responsible for implementing e-learning in their organisations. Over 300 organisations from a wide range of public and private industries/sectors including health, finance, public services, education, and telecommunications, participated.

The majority of participants were larger organisations (over 1,000 staff) with national (UK) and international audiences. About two-thirds were Novice, Sporadic, or Developing Users.

Key findings
The main drivers for e-learning investment were linked to improved delivery and flexibility, increased access, reduced costs, and better administration.

Adding value for the organisation and staff, and rating customer satisfaction through e-learning interventions was increasingly seen as being more important than cost cutting. Key benefits noted by respondents were: saving time, reducing cost, implementing organisational change, and improving the rollout of new products and IT systems. The most popular tools for content delivery (or to support it) were simple simulations, online books, podcasting, rapid development tools, and especially, virtual conferencing (to support content delivery)

Weblogs and wikis were the preferred tools to support collaborative learning. E-tutor support and chat rooms that were well used in earlier surveys declined in usage. Progress towards maturity is not guaranteed. Active implementation, evaluation, and management of e-learning at the organisational, industry, and sector levels are required.

To ensure that e-learning makes a genuine and significant impact on business, it must be aligned to business strategies. Compliance related and job-specific or generic IT software applications were among the most likely training areas by e-learning.

Sporadic Users focus on IT skills and compliance, Developing and Established Users on business skills and industry-specific topics, and Embedded Users on core and other interpersonal skills. The top identified barriers have changed over time from infrastructure to the setup costs to more recently the people (reluctance by staff to engage in e-learning as well as learners and development teams having a lack of knowledge and skill to participate in, and implement e-learning).

Although most employers were confident to link e-learning to jobs or work-related competencies, they were much less confident in whether e-learning was aligning with their overall business goals. The more mature users were more likely to focus on individuals and learner motivation and report that their staff considered e-learning to be beneficial to their careers.

Organisations are more confident in providing IT infrastructure support than managerial support to e-learning. But management support for e-learning is critical. As well as its impact on staff and business results, management should also be engaging with e-learning to support their own learning and professional development. Embedded Users are more likely to gather feedback from e-learning courses and communicate their value back to the business.

Mobile learning in the workplace: Unlocking the value of mobile technology for work-based education

Authors: Pimmer, C., and Pachler, N.

Reference number: 111

Year of publication: 2014

Introduction

Mobile technologies that can support learning such as cell phones, smart phones, and tablets are generating considerable interest. Many experts expect the provision of content via mobile devices for individual study to become the predominant form of corporate e-learning in the near future.

This view is supported by a case study of a large company in the finance sector which is offering traditional e-learning content from their Learning Management System to their employees' BlackBerry devices via images and text (Swanson, 2008). They used well established standards such as SCORM (Sharable Content Object Reference Model) to guide and structure the course design in a formal way. It was considered a success because it was well received by managers and staff and led to an overall increase in competence in the particular subject area.

Key findings

Adopting a text-based approach for content via mobile devices might be the most intuitive approach. This approach allows organisations to reach distant and mobile employees.

However, the learner-centred creation and sharing of content such as multimedia materials via text, audio, images, and video has much more potential, for example intensive care nursing staff videotaping the handling of technical equipment and sharing this with their colleagues via hand-held computers.

Mobile devices support both 'just-in-case' (knowledge acquired off the job) and 'just-in-time' (for immediate work tasks) learning. Just-in-time learning is valued by employees.

Mobile devices can connect employees with subject matter experts (irrespective of whether they are in the person's team or not) to immediately receive support and effectively answer queries. This increases employees' confidence levels and enhances their perceptions of their job performance.

Mobile devices can link informal with formal learning, for example apprentices bridging workplace learning with mentoring or teaching in the classroom.

The employer potential of MOOCs: A mixed-methods study of human resource professionals' thinking on MOOCs

Authors: Radford, A. W., Robles, J., Cataylo, S., Horn, L., Thornton, J., and Whitfield, K.

Reference number: 114

Year of publication: 2014

Introduction
Recent research suggests most Massive Open Online Course (MOOC) participants are workplace learners who use them to up-skill or obtain new employment.

Methodology
A survey and interviews were conducted with human resources staff from 103 companies that broadly represented business, communications, education, technology, manufacturing and related industries (including agriculture), health, government, and the finance and retail sectors.

Key findings
Few respondents had used MOOCs to support their employees' professional development. But nearly three-quarters saw their potential for doing so. Organisations using (or considering using) MOOCs for professional development were generally already adopting e-learning for their workplace training and learning.

The main benefits identified for employees using MOOCs for professional development was that it increased their motivation levels, allowed them to stay more up to date in their respective fields, and advanced their careers. However, some respondents did not think MOOCs would be particularly useful for less educated employees or those engaged in mandatory continuing education.

While the flexibility of MOOCs could benefit 'employees these benefits would not be realised if they had poor or restricted internet access and without structure employees might also struggle to complete the necessary tasks in a timely manner. Those more familiar and comfortable with traditional delivery environments could also struggle to complete MOOCs. To alleviate these concerns it was suggested that employees undertake MOOCs as a cohort or block rather than as isolated individuals.

MOOCs allow employers to dramatically increase the breadth and diversity of their workplace learning provision. For those organisations that needed highly specialised professional development MOOCs were particularly useful. But learning that needed to be 'hands-on' or more interactive was not seen as being suited for MOOCs. While MOOCs could save costs this needed to be balanced by the costs incurred by employees doing them at work instead of their other tasks.

If MOOCs were to be used during work there would need to be more evidence of skills acquisition and long-term impact. However, MOOCs could assist with employee retention if they made greater professional development and career advancement opportunities available. Despite their potential the respondents were unclear about MOOCs' quality.

MOOCs were seen as being lost useful for IT related training (particularly in specialised areas) and developing leadership and management skills. Short duration MOOCs of up to six weeks were preferred. Greater use of MOOCs would come when there was better evidence of their quality and there needed to be a mechanism for confirming their completion (or otherwise) by employees. But completion was insufficient. There also needs to be evidence that MOOCs are contributing to improved job performance.

Unified in learning - separated by space: Case study of a global learning programme

Author: Rehm, M.

Reference number: 117

Year of publication: 2009

Introduction
The availability and flexibility of virtual communities of practice (CoP) means they are increasingly being used to support workplace practice and training because they help support employees with the development of new skills and knowledge, they naturally evolve in the workplace, and they provide choice about if or when employees participate in them..

CoPs should be underpinned by 'situated learning' where people collaboratively engage with real-life problems and case studies in their everyday working environment. In contrast, Communities of Learning operate with a certain amount of structure and dedicated support staff.

Methodology
This case study was based on an e-learning course for managers run through a large international organisation's Learning Management System. Participants were expected to devote about five hours per week to the course which consisted of five core modules. Online discussion forums facilitated by a team of academic staff were a critical component of the course because they contributed 50 percent of the participants' final grades as well as being where course tasks were solved collaboratively. The forums were split into public (mostly focused on knowledge sharing) and private (largely devoted to learning).

There were 174 participants from 81 offices worldwide. They were predominantly older (average age around 45), female, and well qualified (around two thirds having a Master's degree). Data was collected pre- and post-course via an online questionnaire, as well as monitoring the number contributions to the public and private discussion forums (there were 10 times more contributions to the private forums than the public ones).

Key results
CoP are not seen as suitable for formal learning programmes because they are designed for a specific purpose, are limited to a certain timeframe, and are only accessible to an exclusive group of participants.

Of value was the ability to access the course irrespective of time or place, the quality of the course, and the support received. The e-learning had provided learners with a better understanding of new concepts and methods which they could apply in their work, but they were less clear about whether the course had helped them collaborate more effectively within their organisations.

The public forums tended to be informal with the private ones predominantly content-driven.

One major drawback was the amount of time required (eight hours per week as opposed to the pre-course statement of five hours).

Participants overall were satisfied with the performance of their online facilitators and appreciated their enthusiasm in supporting them throughout the discussions. But they indicated that the facilitators should have taken a more active role in the guidance of discussions.

Ensuring quality and measuring effectiveness, impact and capability of e-learning in the workplace

Authors: Saravani, S.-J., and Clayton, J.

Reference number: 122

Year of publication: 2013

Key findings

To ensure quality in an e-learning context, the '5 Ds of e-learning in industry' should be used (in order):

- Define (the training requirements)
- Design (the training events)
- Develop (the resources)
- Deliver (the events)
- Determine how or if e-learning can or should be used to meet the above requirements successfully.

Assessing e-learning's effectiveness and impact needs to focus on two areas:

- The individual level - have employees acquired a new skill, modified or changed behaviour, or increased satisfaction with their workplace.
- The organisational level – is there strategic alignment and business impact, e.g. assessing if the quality of product has improved, dollar value of sales has increased, etc.

Evaluating the outcomes of e-learning is important. The research team devised an e-learning evaluation framework based on the Kirkpatrick model as follows:

- Return on investment - identify how the investment in e-learning training has benefited the organisation and make recommendations for future training activities.
- Impact - measure how the implementation of the e-learning training provided impacted on business results.
- Application - Analyse, over time, how the employees on-the-job behaviour changed as a result of the e-learning training provided.
- Accomplishment - Test if the employees have acquired the knowledge, skills, and attitudes the e-learning training addressed.
- Satisfaction - determine how the employees reacted to the e-learning training provided.

Benchmarking can be used to assist organisations to reflect on their strengths and weaknesses in the integration of e-learning within their structures and processes, identify actions that will facilitate increased learner competence, confidence, and understanding of e-learning applications, and measure and report on the impact of e-learning on strategic alignment and business operations.

The research team developed an A.C.E framework of:

- The 3 A's - Awareness, Action, and Accomplishment.
- The 3 C's - Context, Content, and Capability.
- The 3 E's - Enabled, Engaged, and Empowered.

The process of self-review involves identifying critical success factors which will most likely include: key drivers for deploying e-learning, determining workforce capabilities to use e-learning, barriers to its implementation, and its impact upon the organisation as a whole.

Bridging the gap between knowledge management and e-learning with context-aware corporate learning

Author: Schmidt, A.

Reference number: 124

Year of publication: 2005

Introduction
E-learning and knowledge management are both critical supports for learning in organisations. However, they are typically treated separately, thereby limiting their effectiveness.

Key findings
Knowledge management relies on technical solutions to share concrete (but tacit or informal) organisational knowledge. It tends to ignore how learning takes place and how knowledge can be improved by learning processes.

One of the main assumptions underpinning e-learning is that it needs to, or can be, improved through guidance, either via instructor intervention or smart technology. Simulations are a possible solution to this dilemma but they are often unrepresentative of the 'real world' for an individual company.

Corporate learning tends to come from peer-to-peer interactions. This is especially true for innovative topics for which there is no consolidated view, or highly specialised company-specific subjects.

To successfully merge e-learning and knowledge management and make both of them more effective, capturing the work and personal context of the learner is required.

Delivery of learning needs to recognise that it occurs in real-time while actual work tasks need to be completed.

It also needs to be recognised that resources themselves are created in context and are interrelated with other resources.

Enabling learning on demand in semantic work environments: The learning in process approach

Author: Schmidt, A.

Reference number: 125

Year of publication: 2008

Introduction
Workplace learning that is not immediately applicable and embedded in everyday tasks is becoming much less relevant and useful. As a result learning on demand is becoming increasingly popular. Semantic work environments collect knowledge about user needs from their work tasks and feed back to them appropriate and relevant knowledge and learning opportunities for integration into these work tasks.

Methodology
The author devised a context-steered (driven by the user and their work processes) learning method drawing on e-learning and information behaviour research. The system observes the learner's activities while they undertake everyday work tasks.

It then identifies the potential knowledge gaps from its own and the learner's knowledge gaps, followed by recommending small learning programmes which can be undertaken, postponed until a more suitable time, or ignored completely. The system can also recommend colleagues who have had similar situations or who are experts for informal learning opportunities.

Key findings
The system has several stages - initiate a learning opportunity, select appropriate resources, deliver them to the learner, adapting the resources to changing work situations, and recording the learning for qualifications or employee reference.

The technology is organised into three layers - user-oriented services visible to the learner (via a Learning Management system, email, instant messaging etc), added-value learning services (system identified gaps and delivery of material), and enabling services (learning objects repository and organisational structures/job competency requirements).

The system relies heavily on mapping and may be incomplete, uncertain, and possibly inconsistent. To overcome this, four system layers are recommended which adds a bottom layer that can push or pull information in response to a query, a top layer which manages and retires ageing content, a logical layer to ensure consistent and uniform views of the user's context, and an external layer which provides mapping into application-specific schemas to ensure the same content is available for all.

Social networking

Author: Seymour, A.

Reference number: 127

Year of publication: 2009

Introduction
Web 2.0 technologies can help businesses overcome key challenges including a multi-generational workforce, a global skills shortage, and the rapidly decreasing time for product development. In particular these technologies can facilitate improved interactions and networking which are key contributors to knowledge sharing and development.

Key findings
The success of web 2.0 technologies in improving productivity, learning and innovation is underpinned by three important philosophies - user generated content, collective intelligence, and the social networking that connects these.

Social networking here relates to the large online communities that exist around shared interests and activities.

While Web 2.0 technologies require a major shift in organisational structures and culture they can merge formal and informal learning which creates cohesive organisational cultures.

Formal workplace e-learning tends to occur through Learning Management Systems (LMS), virtual classrooms, and podcasting. LMS' also now house learning content, competency-based learning, and career development programmes.

Where social learning is an integrated component of learning and development strategies, firms are starting to experience a notable increase in the knowledge transfer within their organisations.

Web 2.0 technologies are clearly forcing changes in corporate learning and development because the term 'blended learning' is being redefined to include many different types of interactive content, formal training, informal knowledge, and community support.

At the time of writing the most important content issue was relevance, reusability, and the ability to share it through various delivery mediums. The best way to achieve a sustainable competitive advantage is using Web 2.0 technologies to change how employees connect and interact.

Blended learning and work: Real-time work flow learning

Author: Singh, H.

Reference number: 132

Year of publication: 2012

Introduction
Real-time workflow learning aims to improve the knowledge and transfer gaps arising from earlier e-learning systems. To achieve real-time workflow learning, organisations need to see learning as part of work, and continuously capture and organise all their work and customer-generated information.

Key findings
Real-time learning locates the exact type of information needed and automatically delivers it to a learner (e.g. delivering the relevant learning next to a task assigned on an employee's 'dashboard').

To do that, there needs to be 'performance objects' created that are derived from task-based information and are relevant to job tasks. In this approach business work flows and processes become the e-learning delivery platforms through linking performance objects with automated business work flows.

This content can be delivered via a range of mobile platforms and devices, for example voice recognition systems that allow new forms of interactivity.

A single integrated portal can be provided that links learning and work tasks. These can also be used to foster continuous learning and communities of practice.

The workplace learning objects can be stored in a repository. Collaboration tools such as chat rooms and discussion threads can be linked and referenced within business applications to provide real-time, context-specific learning. An automated mentor captures relevant information and this becomes available just in time for the learner. This also improves connections between subject matter experts and learners for knowledge sharing.

E-learning simulations offer a safe environment to practice and learn, prevent potential errors, and provide immediate feedback for their correction.

Performance monitoring tools can assist in improving workforce skills, competencies, and the quality of related support by monitoring and measuring performance as well as managing task allocation.

Tools are also available to identify productivity bottlenecks. Combined with business process management systems they can assess the exact nature of the bottleneck and deliver the precise learning objects needed to offset performance problems. Immediate feedback from employees can then be incorporated into best practice (after expert review) for distribution back to other employees.

Web-based systems are essential to integrate business work flow and performance support systems. They also allow content to be delivered on multiple devices and platforms in real-time. Using specific learning objects that can be delivered on an as required basis are also critical.

The benefits of this approach are all workers contribute their expertise to integrate learning into daily work, and organisations can achieve significant savings.

Self-employed and online: (Re)negotiating work-learning practices

Author: Thompson, T. L.

Reference number: 141

Year of publication: 2010

Introduction
Self-employed workers often form and use informal online learning communities to solve their immediate knowledge needs as well as knowledge sharing. In addition online learning communities are used by these workers to facilitate professional development and/or provide a support network.

Methodology
The sample population for this study were contractors and consultants who did not have staff. Participants ranged in age from 35 to 51 and had been self-employed for six months to 21 years in a variety of fields. They all had prior experience in online learning communities. Semi-structured interviews and follow up conversations were conducted.

Key findings
Within their online learning communities these self-employed workers were learning: work practices, the viability of doing particular work, how to participate in online communities for work-learning, and how to draw on, and participate in, evolving knowledge.

Online communities offered access to relevant expertise quickly and informally. They also helped participants build stronger skill sets.

Their use of these communities was strategic and very much based around participation on an 'as needs' basis. This strategic engagement extended to which content to utilise and selecting communities and online environments that were more conducive to their requirements.

Access to information layered with others' experiences was highly valued. Participants appreciated accessing other people's way of thinking and how they approached work issues.

Through these communities they learnt things that helped them with their day-to-day activities as well as learning more about particular practices and the viability of certain work.

There was no one online community that met all their needs. Online spaces were stepping-stones to other learning opportunities and spaces, some of which were face-to-face.

The participants could be experts or novices depending on the space or community they were in, and they were more comfortable being a novice in these anonymous environments than in a typical workplace.

They also used these spaces to position themselves for their next job or career opportunity.

Online learning in the workplace: A hybrid model of participation in networked, professional learning

Authors: Thorpe, M. and Gordon, J.

Reference number: 142

Year of publication: 2012

Introduction
To address key workforce shortages (i.e. its overall capacity and capability) the UK government established a specialist website in 2010 for social workers (the Practice and Professional Environment website or PePLE). It aimed to support continuing professional development (CPD) for social workers by providing timely access to relevant resources. These resources included case studies, videos, practice and discussion forums to assist CPD as well as more formal resources such as learning outcomes statements from the accrediting bodies, and content from the UK's Open University.

Methodology
Analytics from the website and semi-structured interviews and workshops provided the study data. The interviewees were practice teachers (i.e. they supervised students on work placements).

Key findings
The two key factors identified for successful use of PePLE were ease of use (little or no effort to use) and perceived usefulness (increases work performance). E-learning can be used to connect practitioners from different workplaces as well as supporting work-based formal education. It also enables reflection on work-related roles and issues included within multimedia course materials. However, communities of practice are more often really just participation in a network given the time constraints, and costs of maintaining real-time online forums.

Flexible access to e-learning materials can alleviate the time constraints associated with work-related learning.

While the registration process for PePLE was seen as onerous compared to other websites it was easy to navigate and locate information.

It was seen as different from other social worker websites because it focused on learning in and from practice rather than information *per se* and could act as an important reminder for the experienced as well as the newly qualified, and also helped in obtaining initial registration.

The videos in particular were very useful because they demonstrated practice in action and also helped familiarise those who needed to learn more about areas of practice outside their competence or expertise.

There were some access barriers including shared offices and needing to use headphones to watch the videos. Cultural expectations also create barriers (including the view that screen-time is not work-related).

Although the website engagement is typically brief (the design needs to reflect this), value was still obtained from shorter burst of focused activity and the site did allow for refection and deeper engagement as and when required for both novice and expert.

It also enabled them to more effectively link their online and offline learning and working environments to support improvements and alternative approaches to practice.

Returning users to the PePLE spent longer and a wider range of content was accessed.

Hop onto mlearning!

Author: Trivedi, T.

Reference number: 143

Year of publication: 2011

Introduction

M-learning (or learning through mobile devices) is becoming an increasingly important component of workplace training. E-learning technologies noted in this article include emails, video and audio conferencing, electronic texts and images as well as mobile devices such as iPads, iPhones, and Android phones. The proliferation of e-learning is the result of the demands of the new global economy.

Key findings

There is large growth globally in the use of mobile devices especially to access the internet. Their ability to provide more flexible access for anytime, anywhere learning is one of the reasons underpinning this rapid growth and penetration.

Mobile devices allow workers to access just-in-time learning to support their daily work and take advantage of down time when travelling. They also provide learning support in the form of tracking assignments, taking notes, reviewing key concepts, and studying for tests.

However, it is not just content but also the ability to have interactions with others, get real-time updates, and take surveys that is driving the increased use of mobile devices and making them more relevant for workplace learners.

iPad ‘apps’ come in the form of interactive learning lessons and study aids or tools. Android devices also provide access to a range of tools to assist with learning such as e-books, quizzes, fact books, apps on specialist subjects, and wearable technologies which allow users to ‘interact’ with their physical environment by finding out more information about it.

Trainers too can use these apps and devices to prepare courses and more effectively address learner queries.

Grand designs for e-learning - can e-learning make the grade for our biggest corporates?

Author: Unneberg, L.

Reference number: 146

Year of publication: 2007

Introduction
Rapid e-learning is the rapid development of content by subject matter experts (SMEs) rather than the use of formal development teams and processes.

Key findings
Rapid e-learning is valuable due to the time and cost savings achieved, and promoting the creation of in-depth training that can be monitored. It also encourages timely staff participation which is useful in situations like training sales staff about new products or allowing the rapid enterprise-wide dissemination of best practice.

To implement a successful rapid e-learning initiative in a large organisation, the following ten concepts should be considered:
1) **Content creation time**. A rapid approach needs to be demonstrably quicker than traditional approaches.

2) **Small and medium-sized enterprises**. SMEs need to reuse existing content and streamline the creation process by, for example, providing approved graphics and media.

3) **Software tools**. Develop a list of requirements and make sure any product(s) selected meet these.

4) **Project management**. Define the business outcomes, quality assurance, review, and approval processes before project commencement. Ensure stakeholder commitment and appropriate time allocation for SMEs.

5) **Review and approval**. Agree the internal review and approval process and software to support it before commencing an enterprise-wide rapid e-learning process.

6) **Collaboration**. Ensure there is a platform to support collaboration to improve the content quality and greatly reduce its creation time.

7) **Reusing and repurposing content**. Reuse of content greatly reduces development time and costs. The e-learning infrastructure needs to support this, conform to well-established standards such as SCORM (Sharable Content Object Reference Model), and be available through mobile devices, CD-ROMs/DVDs, and print.

8) **Assessment**. Include a pool of questions for randomised testing, infrastructure for tracking assessment results, and incorporation of pre-existing questions and tests into an e-learning assessment module.

9) **Software installation and integration**. Consider per-author licensing costs, any organisational technology prohibitions, hosting arrangements, user technologies required, and the use of course or Learning Management Systems.

10) **Media**. Consider organisational standards and templates for communications and materials, whether the authoring software includes its own media database or integrates with other relevant organisational systems, whether usage and licence terms and conditions can be tracked, and whether a single repository can be created for all approved media for any given project or initiative.

Double your response times

Author: Venkatraman, A.

Reference number: 148

Year of publication: 2011

Introduction
Rapid e-learning is becoming increasingly popular as firms look for e-learning solutions that are personalised and high quality, but are also inexpensive and of short duration.

The available software allows a professional 'look and feel' and multimedia content to be developed for an e-learning course without the input of graphic designers or programmers.

Key findings
Rapid e-learning is particularly useful where content needs updating regularly, is being repurposed from other sources, or where the overall budget is limited. It can also support solutions which are more customised, and greater use of organisational subject matter experts.

It is often used by businesses for compliance training as well as training in process, procedures, and desktop systems and applications. It is also growing in popularity because organisational learning and development teams are being tasked with producing a broader range of content with less money.

Cloud-based systems are also driving the increasing uptake of rapid e-learning solutions, with small and medium-sized enterprises readily able to adopt these solutions.

The result is more extensive use of blending formal and informal training and individual self-study options.

Some e-learning providers believe rapid e-learning devalues the learning experience and overwhelms consumers with poor quality materials. Templates can be used to alleviate these problems.

The move away from external to internal content development is supported by the increasing use of social media and cheaper web-based authoring tools, for example, integration of social networking tools into organisational platforms, as well as use of mobile learning, games, and simulations. But experts do advise trainers to be cautious about ignoring other e-learning solutions and recommend rapid e-learning tools only be used by those with instructional design skills.

Continuing demand for engaging, inexpensive learning content that can be delivered in small components across multiple platforms means that rapid e-learning will remain an important aspect of an organisation's learning and development strategy.

Valuing the adult learner in e-learning: Part one - a conceptual model for corporate settings

Authors: Waight, C. L. and Stewart, B. L.

Reference number: 149

Year of publication: 2005

Introduction
E-learning has become a significant component of corporate training and development because it supports learning that is just-in-time as well as being available anytime and anywhere, at less cost than traditional approaches. But very little is known about how the e-learner is valued in corporate settings.

Key findings
Valuing e-learners in corporate environments requires the integration of four 'championing' factors which are leadership, learning culture, technology infrastructure, and finance. Leaders must provide the necessary financial support and communicate a shared vision for learning that encourages system thinking, broadens employees' frames of reference, and creates an environment where mistakes are allowable and are perceived as learning.

Given that technology continuously advances, continuous improvement and innovation of e-learning solutions is imperative. Technology must also be scalable, interoperable and standards cognisant.

Needs assessment helps design relevant learning, while learner analysis is important to identify employees' technological skills which can be a major impediment to their success in e-learning environments. Exploring work design is also crucial because it helps identify authentic case studies and scenarios that are relevant to the workplace.

Content analysis can help to identify relevant content, content type, and its appropriate compartmentalisation and sequencing. Content analysis communicates what will be taught and in what sequence it will be presented. Thorough analysis of the technologies that are available for design, development, communication, distribution, delivery, performance support, and assessment must be undertaken to ensure the usability of the support e-learning provides.

Return on investment skills are essential for assessing the value of learning at the individual, group, and organisational levels, as well as focusing attention on development costs. Familiarity with key learning theories (e.g. self-directed learning, and critical, reflective, cognitive, and social learning) are also highly desirable attributes to have within organisational e-learning teams to ensure learning engages all learners, is culturally relevant, is seen as more than just about technology, and is meaningful.

A thorough understanding of the organisation's technological readiness is central for e-learning design, development, and delivery, including an assessment of web access and bandwidth limitations, relationships between the IT and training/development departments, the e-learning portal, communication and collaboration tools, the e-learning strategy, and Learning Management System (LMS).

There also needs to be an assessment as to whether the organisation has the right e-learning talent available. An LMS must allow learners to plan, access, launch, and manage their learning and the development team must have competencies in technology operation, graphics, media selection and publishing, instructional design, programming, and audio and video production.

Creativity requires diverse teams, supportive leadership, ample resources, environments that promote autonomy, risk taking, and external competition, a social network, and an ability to interact with external stakeholders. If all the above factors are implemented successfully engagement, learning, and transfer are the three major outcomes that e-learning can achieve.

Learn the language or lose the learner: How video games have shaped Generation Y's expectations

Author: Walter, C.

Reference number: 151

Year of publication: 2012

Introduction

The rapid and unstructured uptake of e-learning has led to a lack of attention on good instructional design and supporting learning platforms. Generation Y learners (a blanket term used to refer to people born between 1980 and 1994) typically have specific expectations about what corporate e-learning should consist of. They do not value e-learning that lacks interactivity or is underpinned by static text-based content.

Key findings

Generation Y learners have grown up heavily immersed in video games. Video games assist these learners with social contact, status, safety, self-esteem, and self-identity. These games are also underpinned by constant and attainable rewards and supported by communities.

The user interface needs to balance a game that is easy to learn, but hard to master. In short mastery is achieved incrementally and the game should encourage this. They also need to provide sufficient incentive for learners to want to continue

Incorporating video game thinking into organisational e-learning course development processes could prove to be the easiest and fastest way to transform content into more learner-friendly and smaller components.

Video games allow a high degree of peer coaching, collaboration, and exploration in a safe environment.

E-learning often receives mixed responses and the best approaches tend to be instructor led which are typically expensive. Learning and development teams should consider incorporating video games into traditional delivery approaches which is not as complex as many believe.

PDAs as lifelong learning tools: An activity theory based analysis

Authors: Waycott, J., Jones, A., and Scanlon, E.

Reference number: 152

Year of publication: 2005

Introduction
Recent developments in mobile devices have converged with an increasing emphasis on lifelong learning in workplaces. The Personal Digital Assistants (or PDAs) mobile device which allow users internet access and to communicate with each other is the focus of this study.

Methodology
Mobile knowledge workers in this study refer to people who travel frequently for work, and whose work revolves around the creation and use of information resources. These individuals need constant access to up-to-date information while out of the office. The company was a large, international organisation known as NatGasCorp or NGC. 16 employees were interviewed who were broadly representative of the types of work NGC typically carries out.

Key findings
PDAs have a number of learning benefits including an increase in the feeling of ownership of the learning by employees because they own the device as well as their ability to facilitate anytime, anywhere learning.

Learning increasingly occurs in a range of different places, times, and personal and professional areas of interest. Mobile learning has been linked to lifelong learning because it supports its occurrence across these ranges of times, locations, and personal and professional areas of interest.

Employees noted the importance of communicating with colleagues and the necessity of tools that supported the constant sharing of information.

PDAs were made available to the workers so that they could access the company's intranet which acted as a repository for a range of organisational information including the firm's policies.

Most staff, however, used their PDAs as electronic diaries and address books as the project was not supported well, the intranet information was often out of date, and the users could produce information as well as access it. PDAs were seen as sufficient for passive access to information, but not for active use of company systems to support work at remote locations. As a result NGC replaced the intranet with a portal to provide access to more current information and replaced the PDAs with devices that provided a greater range of functionality.

PDAs also have other constraints including their small screen size which limits the content that can be viewed as well as their limited data input methods (i.e. these normally consist of using hands or some sort of digital 'pen').

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A learning ecology model for blended learning from Sun Microsystems

Authors: Wenger, M. S., and Ferguson, C.

Reference number: 153

Year of publication: 2012

Introduction
Each of Sun Microsystems' workplace training activities is supported by a range of digital and non-digital resources and activities including traditional delivery lectures, video conferencing, online labs, peer and wider discussion forums, authentic tasks, and role play.

This blend of e-learning and traditional modalities and resources allows more efficient use of classroom time (through pre work) as well as extending the overall learning time (through post class mentoring and online discussion). It also allows instructors and learners to use the available resources in unanticipated, individualised ways. And online labs can be used to reduce costs and distance.

Key Findings
Workplace e-learning needs to determine the roles of participants. Designers often overestimate their control over the learning experience, given traditional delivery environments are usually determined by instructors. It is also important to take into account the significant role informal learning plays in workplace training.

E-learning costs are complex partly because of the large upfront investment required balanced against the additional variable cost for each new participant (which tends to be lower). Content costs are high, but multipurpose use can be increased which lowers the cost for additional material.

Automating and personalising the online experience is complex and costly partly because it requires many different components combined with rich, dynamically updated user data. But this can be managed by each individual learner via a Learning Management System.

Shifting to a knowledge framework focuses on internal employee support that provides critical up-to-date access to new product information, software and hardware updates, performance support procedures and diagnostics, localised content and rule-based content and systems. This is premised on the idea of people exploring resources for ideas and insights, supported by experts. This framework also supports and guides employees applying knowledge and skills to new situations while keeping in mind their external customers' requirements.

Learning Management Systems for the workplace

Author: Winter, M.

Reference number: 155

Year of publication: 2006

Introduction

The Tertiary Accord of New Zealand[13], the Public Sector Training Organisation, and Christchurch Polytechnic Institute of Technology developed a number of workplace e-learning programmes for public sector employees and meat inspector supervisors.

The suitability of two different Learning Management Systems (Blackboard and Moodle, the largest vendors in New Zealand's tertiary education sector) was investigated to determine how effectively they were able to support e-learning in New Zealand workplaces.

Key findings

The study found that there is no ideal solution for organisations wanting to adopt a Learning Management System to support their e-learning efforts.

The Blackboard system is suitable for those who want the security of a proprietary system and can afford the licensing costs as well as being able to manage the constraints of a course-based system.

Moodle, as an open source system, is the most engaging Learning Management System, supports more and higher quality interactions, is more flexible, and has no cost.

A locally developed Learning Management System, Interact, has too small a user base to be suitable as a solution for New Zealand workplaces.

[13] This is a consortium of New Zealand polytechnics that jointly deliver e-learning programmes. For further details refer to the Ministry's earlier annotated bibliography on government and sector-level tertiary e-learning initiatives.

The implications of SCORM conformance for workplace e-learning

Author: Witthaus, G.

Reference number: 159

Year of publication: 2009

Introduction

SCORM (Sharable Content Object Reference Model) is designed to support Learning Management System delivered materials. SCORM is heavily structured and best supports clearly defined, linear training events.

Despite these limitations SCORM has been well accepted in the corporate sector because it supports a single learner, self-paced and self-directed delivery approach. SCORM also allows detailed tracking of all employees' activity while in the training event. And because it is compatible with all leading Leaning Management Systems (LMS) SCORM also promised companies a substantial return on their e-learning investment.

But SCORM is largely used for compliance training and makes extensive use of low challenge training materials. As a result workplace e-learning has severe credibility problems. Completion rates are low and often rely on repetition until by a process of elimination the correct answer is arrived at.

Key findings

Large, commercial LMS have been so successful because they can rigidly administer employees' progress through a linear path of prescribed programmes. But despite increased uptake many organisations and their trainers and staff are questioning the efficacy of this LMS led approach to training especially given the low completion rates for them.

The term e-learning 2.0 reflects the shift to much more interactive and engaging learning made possible by emerging and new technologies. This shift also represents a move away from an overemphasis on content to how collaboration and interaction between learners, learners and teachers, and learner and content can improve learning experiences and outcomes.

There appears to be growing demand for industry training that encourages informal learning and peer to peer collaboration. The increasing ease with which learners can create and customise content has led to a decrease in the uptake and possibly relevance of off-the-shelf training programmes. Gaming is also emerging as an increasingly popular option in some parts of the workplace e-learning sector. And gaming can take place within SCORM conformant LMS.

There may be several advantages to retaining LMS for the foreseeable future. Firstly, it is easy to familiarise trainers/instructors with LMS environments. And secondly, LMS as noted above can also support external content as well as increased interaction and collaboration. For example, learning materials could be made available as integrated learning objects in people's daily work routines rather than being located in relatively inaccessible LMS environments.

Mobile learning and immutable mobiles - using iPhones to support informal learning in craft breweries

Authors: Wright, S. and Parchoma, G.

Reference number: 160

Year of publication: 2012

Introduction
Several brewers have used iPhones to assist with their beer production by downloading relevant brewing ‘apps’ or podcasts for not only making beer, but also monitoring it through to the finished product. The iPhone also enables particular recipes to be emailed, printed, or attached to a whiteboard.

Key findings
This learning approach has its problems which challenge the idea of mobile devices being easy and useful learning devices. For example, if incorrect information is entered because of a slip of the user’s finger the recipe in the app no longer matches the ingredients. Users do not query the app, but rather the ingredients’ supplier. This results not in learning but in confusion.

Problems also occurred when the app’s predictions did not match the actual real-life process and associated observations.

To avoid the above errors, another brewer used their computer to record more complex data. They also use other technologies and mediums to support their beer production including YouTube videos for the construction of equipment.

Organisational learning as an emerging process: The generative role of digital tools in informal learning practices

Authors: Za, S., Spagnoletti, P., and North-Samardzic, A.

Reference number: 161

Year of publication: 2014

Introduction

Informal learning is becoming increasingly important in supporting organisational learning. How e-learning can support informal learning is therefore a key question. For example, e-learning is seen by some as having a transformative role because it can link internal and external resources. Adaptive educational hypermedia combined with intelligent tutoring systems enable personalised learning experiences.

E-learning can also support exchange of information and employee development of content. For example, Massive Open Online Courses, online communities of practice, social media, and video streaming provide workers with on-demand access to potentially limitless knowledge as well as facilitating content development and sharing this with peers.

Key findings

However, research has tended to ignore the complexity inherent in e-learning supporting informal learning. The authors hope to redress this balance by focusing on complex adaptive systems (CAS). In an organisational context these systems refer to semi-autonomous individuals acting in coordination as well as responding to external stakeholders and the wider environment to maximise their potential for success.

CAS have a propensity for self-organisation, build hierarchies and structures to conserve resources, come up with innovations to solve problems, and support learning in the face of environmental constraints. CAS support learning through facilitating communication, monitoring, and feedback. They are critical in enabling iterative learning that in turn enhances organisational learning.

E-learning supports self-generated learning that increases worker capability through accessing both internal and external knowledge. Employees can use digital tools for self-monitoring of their performance and assessing the skills and capabilities obtained in this context.

However, some form of external feedback is important to validate this learning and ensure that it is both appropriate and relevant. This can be done through organisational intranets and other digital platforms. For example, LinkedIn can be used to endorse colleagues as holders of specific skills and experiences while wikis enable the collaborative production of knowledge which in turn facilitates the absorption by employees of new competencies and skills.

Putting customers first at Microsoft: Blending learning capabilities with customer needs

Authors: Ziob, L. and Mosher, B.

Reference number: 162

Year of publication: 2012

Introduction

Microsoft provides blended learning solutions which they define as 'any combination of distance and classroom delivery with various digital (resources) and e-learning tools to achieve a positive business outcome'. This environment is supported by the Microsoft suite of products including Word, PowerPoint, and Adobe Acrobat. It also requires that individuals have the correct materials and learning environments to assist them in moving from where they are to where they need to be.

Microsoft's new training framework has three key concepts:

- Assess - using the Microsoft Skills Assessment tool to identify the baseline skill levels of staff and compare these to the proficiency required for particular projects. Skill gaps are identified and reports produced from an organisational perspective.
- Learn - skills gaps inform personalised learning plans to be produced at a staff, team, and organisational level.
- Apply - apply the training in practice and evaluate the outcomes to compare the organisation's actual, measurable progress against its set goals. This assessment can include validation of skills mastery using certification alongside quantitative measures of improvements related to productivity, competitiveness, and customer and supplier relationships. These assessment results are fed back into the next development project for continuous improvement.

The State of Wisconsin's project objectives were to shift to a centralised agency to manage the state's servers, standardise the available products, and train staff to fill vacancies caused by retirement. Mentoring and technical telephone support was provided. For the e-learning component a partnership approach with other providers was adopted and the courses were made available to staff on a web-based learning portal. These courses were provided in multiple languages and accommodations were made for hearing and sight-impaired learners.

Key findings

More than 1,700 individuals were trained in a 12 month period.

Of a total training cost of US$900,000, only US$250,000 was for the e-learning component. The state estimated it saved more than US$1.2 million compared to purchasing standardised training.

Course content continues to provide employee and organisational value through an ongoing offering from Wisconsin Employees' Virtual University.

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9 APPENDIX A – BIBLIOGRAPHY OF OLDER LITERATURE

This section lists the literature that relates to workplace learning from 2004 or prior in alphabetical order.

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