E-learning: Ageing workforce versus technology-savvy generation

Introduction

In developed economies such as Australia, e-learning has emerged as a significant

addition to traditional models of workplace training. In a recent survey of 800 Australian

employers, 50% indicated that their organisation was already using e-learning, and 60%

expected this use to grow in the next two years (Australian Flexible Learning Framework,

2010). E-learning is commonly used to enhance learning, improve performance, develop skills

and increase levels of motivation (Ali & Magalhaes, 2008). Moreover, e-learning is often

argued to be more accessible, efficient and cost-effective than other forms of corporate training

(Kathawala & Wilgen, 2004). E-learning can also provide the opportunity for ongoing learning

and information sharing across geographically dispersed organisations (Barnes & Charles,

2004). It is for these reasons that e-learning offers attractive prospects to industries such as rail,

but these organisations have embraced e-learning to varying extents.

Conversely there is also widespread argument that traditional organisations and industries

with a predominantly older workforce, who are not using computers as an integral part of their

work, are unlikely to embrace the opportunities afforded by e-learning. While many rail

organisations are considering or are already using e-learning options to deliver training

programs within their widely dispersed organisations, the challenge remains to engage a

younger generation of learners who seem comfortable learning with technology, whilst not

alienating those older learners who may prefer to learn in more traditional ways.

The aim of this paper is to explore how one traditional industry is using e-learning and

whether there are age-related issues associated with its use. The ultimate goal is to identify

potential future uses across generations of workers. The paper begins with the examination of

the debate about differences between younger and older learners – referred to by some as

"digital natives" and "digital immigrants" (Prensky, 2001) – and explores the potential of this debate for informing the wider e-learning agenda. Findings from research conducted across the Australian rail industry are then presented. These results point to some potential future uses taking into account age differences, but also the need for further empirical research to inform the argument about whether worker age is a significant factor impacting upon adoption and use of e-learning.

The emergence of e-learning

Within the broader context surrounding the debate about the technological literacy of different generations and the potential for educational change, e-learning has emerged as a learning and development approach to enable organisations to keep up with an ever changing world (Wellman, 2007). E-learning has been the subject of wide discussion in the literature, with much of the early research having been conducted in the tertiary education sector and other similar settings (Barnes & Charles, 2004). Corporate university and vocational education and training (VET) settings have only started to emerge in the literature more recently. However, there remains a dearth of empirical research to establish the effectiveness or otherwise of different e-learning approaches, particularly in organisational settings (Wang *et al.*, 2010, Welsh *et al.*, 2003).

Many terms have been utilised for learning involving technology, and definitions (and even terms) are varied depending on the community and the context. Whilst this can create challenges for reviewing the literature, the concern of Servage (2005, p. 305), that there is an "utter lack of consistency" in the terminology surrounding e-learning, is perhaps an over-reaction. The literature search for this research found that definitions of e-learning range from the simple to the more complex, but typically have similar elements. The simplistic definitions tend to focus on the idea that e-learning is "instructional content or learning experiences

delivered or enabled by electronic technology" (Servage, 2005, p. 306), and this is the definition adopted for this research. The focus of the research was to investigate how case organisations were using technology as a part of learning and development processes.

E-learning technologies are offering efficiencies to traditional learning and teaching practice. Specifically, for geographically dispersed organisations, e-learning can offer many benefits not available with traditional classroom-based instruction and training (Barnes & Charles, 2004, Beamish *et al.*, 2002). It seems a logical progression to enable organisations to distribute training and critical information to staff within and across both small and large organisations. E-learning may also provide an opportunity to develop new types of skills, particularly in older employees. Historically, reference has been made to the "three R's" (reading, writing, arithmetic) as the most important literacies. In the 21st century, having the ability to communicate and operate within an online environment (e-literacy) is just as important (The New London Group, 2000). This new dimension of information communication technology (ICT) literacy, along with the "three R's", is referred to as multi-literacy (The New London Group, 2000). The focus has now broadened to include technology as a critical literacy for all employees.

The inclusion of technological literacy has impacted on the older workforce in a number of ways. Older employees often face the stereotype that they are rigid, do not want to learn, are resistant to using computers and have great difficulty using them, although this does not mean that older individuals are not interested in participating in e-learning at work (Githens, 2007). To implement e-learning successfully requires, among other things, senior management commitment, an understanding of cultural and technical obstacles and a need to be compelling to the target audience (Henry, 2001). If that audience comprises both older and younger employees, a further challenge involves addressing the needs and preferences of both groups

whilst also acknowledging the importance of knowledge transfer between older and younger employees.

One of the most critical messages for any e-learning discussion however, needs to be the recognition that this approach is not the answer to every type of learning situation. Fundamental principles of adult learning, regardless of the delivery medium are still critical to any form of intervention. Ensuring that the audience and learning objectives or outcomes are clearly understood and articulated should remain a priority of learning and development (L&D) professionals. Only after this is established can e-learning be evaluated as a potential means of facilitating learning outcomes.

Implications for training in a technological society

There has been debate over the past decade about the younger generation that has grown up with technology and the extent to which this impacts on learning approaches. Widespread consensus among educators is that digital technologies have given rise to a new generation of learner. Growing up with internet access and other digital technologies, it is argued, has transformed approaches to education and training.

Frand (2000) offered a way to view the younger generation that has grown up with technology, referring to their possession of an "information mindset". Frand (2000) was specifically describing characteristics of those who have been born during the age of technology. Since this time, a debate has emerged about the differences between the generations in terms of their learning approaches and preferences and the way in which they view technology.

In 2001, Prensky coined the terms "digital immigrants" and "digital natives". Prensky (2001) argued that those individuals who have grown up with technology have a very different outlook from those who have learnt to use technology at a later stage in their life, likening it to

the learning of a language. It is argued that learning a language later in life engages a different part of the brain, fundamentally impacting upon how we use that language (Prensky, 2001). His proposition was that the younger generation are native speakers of technology, fluent in the language of computers, video games and the internet. Hence, their requisite skills and knowledge are vastly different from earlier generations', and therefore the education and training methods of their predecessors are limited in their usefulness. This critique was levelled at an education system developed by digital immigrants, and Prensky (2001) argued the need for a radical change to the way digital natives are educated because of their preferences for parallel processing, multi-tasking, random access and graphics.

Whilst this argument had face validity and was appealing to a wide range of audiences, it sparked a call for evidence to support such claims. Bennett, Mayton and Kernin (2008) cautioned that the idea of a new generation that learns in a different way could be counterproductive in education because these types of sweeping generalisations "fail to recognise cognitive differences in young people of different ages and variation within age groups" (Bennett *et al.*, 2008, p. 779). This commentary is supported by Helsper and Enyon (Helsper & Eynon, 2010), suggesting that age is not the only factor that impacts upon ways in which we learn with technology. Senior and Cubbige (2010) also warned against classifying this generation as digital natives, but acknowledged that those born when technology was widespread and mainstream do view knowledge differently from older generations as well as interact differently with one another. Educational institutions were urged to consider how these individuals are taught and how they are effectively integrated into the workplace.

Regardless of the potential for difference, it needs to be questioned whether the younger generation in its entirety can be assumed to possess superior technological expertise. As Facer and Furlong (2001) warned, there are youth who do not engage with technology for a range of reasons including access difficulties, lack of perceived applicability to daily life and lower

educational standards and opportunities. Further, even when the younger generation does demonstrate a higher use of technology in a general sense, it should not be assumed they have the necessary skills and abilities to engage in learning via this medium. Specifically focussing on the issue of information literacy, it is a common warning resulting from research that just because learners may spend a lot of time using technology, this does not equip them with skills for using that technology specifically for learning or information gathering and evaluation (Brown *et al.*, 2003, Oblinger & Hawkins, 2006).

Questions have also arisen as to whether a year of birth defines whether or not an individual is considered a digital native, or whether it is possible to "become" a digital native with sufficient exposure to and experience with technology. In research conducted by Helsper and Eynon (2010, p. 504), it was found that "breadth of use, experience, self-efficacy and education are just as, if not more, important than age in explaining how people become digital natives". So, whilst the distinction between digital natives and digital immigrants has begun a conversation and critique of approaches to learning and education, it is also clear that more empirical research is essential to separate facts from appealing anecdotal distinctions. With this caveat in mind, it is also clear from the literature that there are generational considerations for the use of e-learning.

The Australian rail industry: The challenge of e-learning in a traditional industry

The Australian rail industry represents a more traditional and less "high-tech" working environment than might exist in other sectors. An industry such as this may, by its very nature, offer additional barriers to the adoption of e-learning. Although there is still a significant move towards the integration of technology into the sector, the workforce in the rail industry remains predominantly blue-collar labour undertaking manual work, the majority of whom hold a maximum of secondary or trade qualifications. Throughout urban and regional Australia, the

rail industry employs over 40,000 people in diverse occupations, spread across the continent. The challenge of an ageing workforce is being felt more acutely in the rail industry than in the general workforce, with the ABS Labour Force Survey for 2006 indicating that the median age of Rail Transport workers was 44 years, while the median age of all Australian workers was 39 years (Australasian Railway Association Inc, 2008, p. 5). The Australian Rail Association (ARA) expects almost 20% of the current workforce to separate from the industry, further impacted by another 20% in retirements before 2013 (Australasian Railway Association Inc, 2008, p. 27).

Coupled with this loss of workers, the industry faces the problem that youth are not attracted to rail, nor are new recruits retained, and it has been argued that younger employees are a major labour pool which could be better accessed for the sustainability of the industry (Australasian Railway Association Inc, 2008, p. 13). The overall labour turnover in the rail industry is relatively low in comparison to other industries (Australasian Railway Association Inc, 2006) and retention in general is not seen as a key issue for the industry, with the exception of particular professions and expertise that are subject to shortage beyond the rail industry. However, research has shown that retention is disproportionately low in some demographic groups, especially in the group of employees aged 25 years and below. "It is cause for concern that the stereotypical image of the rail industry as being slow and resistant to change is unlikely to change without a key focus on innovation which in turn is difficult without an element of refresh in the workforce" (Australasian Railway Association Inc, 2006, p. 11).

Workers who intend to exit the industry in the short term report being least satisfied by training, and this concern, amongst others aspects, is given as a reason for considering their departure from the industry (Australasian Railway Association Inc, 2006). Therefore, there is an imperative to develop training resources available to the industry to meet not only the needs and preferences of the current workforce, but also those of the future workforce, and

particularly, the younger generation. As the Australasian Railway Association (2006, p. 15) argues, the view of skills development in the industry is linear and traditional, and this approach "is unlikely to meet the expectations of younger workers joining the industry". This is because younger generations are more accustomed to rapid, parallel processing and tend to seek immediate feedback and rewards (Prensky, 2001). Therefore, e-learning is argued to be better suited to meet the needs of these younger workers who are more accustomed to the use of electronic mediums. However, it is important to bear in mind that much of the training in the rail industry occurs within the blue-collar workforce which does not use computers as a part of its daily work and is often assumed to have limited technological literacy. Such assumptions, however, have not been tested, and as highlighted throughout this literature review, the implementation of e-learning often relies on assumptions or estimations.

This research aimed to explore how one traditional industry is using e-learning and whether it is finding difficulty with age differences in the workforce, with the ultimate goal of identifying potential future uses across generations of workers. To achieve this aim, the following research questions were the focus:

1. How is the Australian rail industry currently using e-learning?
2. Are there age-related issues with the current use of e-learning in the rail industry?
3. How could e-learning be used in future to engage different generations of learners in the rail industry?

In order to answer these questions, a research design and methodological approach were developed and utilised with five case organisations within the Australian rail industry.

Methodology

Due to the exploratory nature of the research, a qualitative case study approach was determined to be most appropriate. When the objective of research is to gain a detailed understanding of the phenomena in question, case studies provide an opportunity for researchers to gain a deeper understanding than the use of quantitative approaches (Burns, 2000, Creswell, 2005). When choosing cases, a purposeful sampling method was employed to ensure that case organisations ranged in size, location and extent of current e-learning usage.

As is predominant in the Australian rail industry, all five case organisations are 100% state government owned, and each case organisation is based in a different Australian state; however, some also operate interstate for some services. The case organisations cannot be identified by name, in accordance with the terms of the ethical clearance for this research; however, a detailed description of each organisation, its background and operational focus is provided in Table 1.

Insert Table 1 here

Semi-structured interviews of between one to two hours' duration were conducted with the staff member identified in each of the five organisations as most heavily involved with the design, development and implementation of e-learning. In one of the larger companies, this was an e-learning specialist, but in the others, it was the learning and development manager. A broad range of topics were covered in these interviews but for the purposes of this paper, the focus remains on current use, implications of age differences and potential future uses for different age groups. The broader set of interview questions canvassed included the degree to which e-learning is being used in the organisation; how learning materials are being developed; how effective the learning materials have been and how this effectiveness is being measured;

advantages and barriers to e-learning within the organisation, and the possibilities for future use of e-learning.

In addition to the interviews, organisational documents were obtained where available, and demonstrations of the e-learning products currently in use were provided. These demonstrations and observations were conducted after the initial interview and notes were taken by the researchers to complement interview findings and transcripts for use during data analysis. In order to conduct the data collection in each of the five case study organisations, the researchers typically spent a day with each organisation in the field.

All interviews were recorded and transcribed to ensure an accurate account of the content, and thematic analysis was conducted using NVivo. As research questions were already articulated, and the background literature provided an indication of potential themes, theoretical thematic analysis was considered most appropriate (Braun & Clarke, 2006). Coding was therefore conducted using a table of initial coding nodes relating to the research questions. To provide a measure of consistency, the coding was undertaken by one research associate and then checked by the lead researcher. As this paper takes a narrower focus than the overall project, the codes specifically relating to current use, age-related issues and potential future uses to address age considerations were used to underpin the analysis in this paper. Vignettes from interviewees identified as typical of comments from each of these themes have been included in the discussion of findings.

Findings

The data collected from the five case organisations were collated and analysed in order to address the research questions. Interview transcripts, along with the secondary data in reports and other organisational documentation, provided the basis for the findings.

Current use of e-learning

The first research question focussed on an analysis of how e-learning is currently being used in the Australian rail industry. There are a variety of e-learning systems being used, from in-house stand-alone platforms or systems integrated with the HR Information System (HRIS) through to use of outsourced e-learning programs. Some of the case organisations are quite advanced in their use of e-learning whilst others have only recently implemented limited amounts of e-learning.

Two key elements were considered in relation to the first research question: the type of content being delivered via e-learning, and the current e-learning systems and approaches. Each of these elements contributes to a more comprehensive understanding of the current use of e-learning in the rail industry.

All five case organisations were using e-learning to some extent. However, the size of the organisations tended to have a direct correlation with the amount and extent of e-learning used. The two larger organisations had budgets that provided for e-learning specifically, and could benefit from the economies of scale resulting from a large workforce accessing the training. As one interviewee from one of the large organisations explained:

> A large audience is a good start because e-learning's typically more expensive to build than face-to-face but if you've got a large audience the unit cost of delivering e-learning is much cheaper. Ultimately there's a return on investment point in that. (R3)

The three smaller organisations struggled to justify the large up-front expenses associated with e-learning products, but even these had some form of e-learning or blended learning solution, with an increase in its use planned for the future. Many of the rail organisations interviewed were not only responsible for compliance in relation to their own employees, but also had a duty of care to contractors and other third parties. The use of e-

learning for these audiences therefore provides an opportunity to significantly boost the number of participants which, in turn, could bring down the unit cost of e-learning.

The most widely addressed content in e-learning was of a compliance or regulatory nature, and e-learning was identified by all five organisations as a useful vehicle to meet the statutory and legal obligations of their organisation.

A lot of the new ones that we have that fit into the mould of corporate

management training, that is that everyone at [R4] has to do them. Things like

information security, environmental awareness, code of conduct, building

emergency procedures, evacuation procedures for individual buildings. All

those sort of courses have to be done on a regular basis, depending on the

actual product, some are 12 months, some are two years... (R4)

In my experience some of the main areas that get traction are around things

like compliance training. You can do a fair degree of procedural training, too,

online and that can be reasonably effective. (R3)

At the broadest level, this compliance training included content such as occupational health and safety (OH&S), security, rail safety requirements and environmental compliance, and then a range of more specific, technical and job-related compliance topics. Even within the single industry, there is significant variation in regulations across Australia, and the ongoing evolution and revision of these offered significant training challenges for every case organisation. The ability to roll out e-learning to address these changes in regulations was seen as an attractive alternative to face-to-face methods:

I think the business is more aware of some of the efficiencies [e-learning]

offers and on the backs of things like our own self insurance where we had to

have so many people trained in so many things for OH&S ... They recognised

that whilst that was all done face-to-face … it was huge. Tens of thousands of

training interventions and the business, when they have to do that, it's a killer.

So they're just looking for better ways to deliver some of this [training]. (R3)

However, being able to promulgate training about changing regulations and requirements is only part of the equation. The nature of rail organisations means an extensively geographically dispersed workforce. This necessitates extensive travel expenses in order to attend face-to-face training in the larger metropolitan centres and, often more significantly, an accompanying disruption of work to allow for travelling time and absences. Therefore, e-learning was also used to minimise the requirement for travel and time away from normal duties:

One of the main issues with operations is removing people from the job. When you have a face-to-face [training] situation you have to remove people from the job. We have roster processes and things like that and sometimes it's so finely tuned that to remove someone is very difficult. Now by using online and blended learning options that reduces that and managers are quite keen on that. (R5)

In relation to the approaches being used, one notable finding is the fact that all five of the organisations in many situations had chosen the use of blended learning in preference to courses that were entirely online. In these cases, the organisations were attempting to use the benefits of some delivery electronically, whilst not totally losing the face-to-face element valued by many learners. It is of note that e-learning was not seen as the answer to all learning and development requirements, even by those who were strong advocates:

Well … e-learning is not the best for everything and I mean, I know that. I'm an e-learning developer and my whole career is based on that [but] I do agree that face-to-face can work better than e-learning in certain situations. E-learning can work better or the same as, in other situations. You know, where

you might have a two-day course, I might be able to build you an hour long

module that covers the same sort of content, have the same sort of learning and

outcomes. (R4)

The approaches to "blending" learning, however, differed significantly depending on the

content being covered, and the target audience for the training. Some of the approaches to

blended learning involved conducting preliminary e-learning modules that were later followed

up with shorter, face-to-face, classroom-based training for extension and application purposes.

Two of the organisations were involved in training that was conducted as an e-learning course,

but participants were still located in a room together to undertake this training to allow for

additional support when necessary:

At the moment they don't have the PCs so they're presently coming into the

central location, that's in their head office, and there's a number of PCs set

aside, they're more or less as kiosks, so people are rostered through to do their

training there… We have PC training rooms, so for this procurement roll out,

etc, there's PC training rooms set up around various points and training is

delivered that way in a classroom, and often all the learning for some of those

things is actually offered basically on the PC but there's someone there to hold

hands. (R3)

In regards to the systems being used, most of the rail organisations were in the process

of planning for, or had just implemented, changes to their enterprise information systems (EIS).

In some organisations, the learning management system (LMS) was a part of this EIS, but in

other cases, it was a stand-alone system. The move to a different EIS in most cases had

significant implications for the e-learning offerings. In some cases, e-learning was to become a

part of this system and in others, the e-learning or learning management system was to be left

separate from these wider systems. Much of the drive to use wider systems or more advanced

e-learning systems was related to a need to automate some of the administrative components of learning and development (L&D). For example, many LMS have the ability to automatically notify of the need for refresher training, and to integrate with the human resource information system (HRIS) to record training undertaken in the employee's records.

Overall, it was apparent that e-learning is being used predominantly for compliance, potential cost saving and minimising disruption to work and that the full potential of e-learning for learner interaction and engagement, two-way communication and other more advanced uses is not yet being harnessed in all cases.

Age-related issues with the current use of e-learning

The second research question complemented the first and focussed on whether the case organisations were finding age related issues when implementing e-learning in their organisation. In conducting interviews, a deliberate attempt was made to not direct responses toward age as a specific issue and therefore, as outlined in the methodology, no lead question was asked specifically about age. Where interviewees identified age or a related issue when questioned about advantages or barriers to e-learning, probe questions were then used to further explore this area. All five interviewees raised the issue unprompted, either referring specifically to younger learners, to older workers, or to a combination of both. The responses provided an initial insight into current challenges being experienced but also highlight the level of assumptions which may be made when about age and technological literacy.

The interviewees all believed they had experienced age-related issues with e-learning use. In some of the organisations, decisions had been made about whether or not to use e-learning for specific groups based on their "preference" or not for technology use, which was linked to age rather than any other variable. For example, assumptions were made that regardless of their work role or technological expertise,

younger workers would automatically prefer to engage with technology than with trainers in a classroom situation:

> Because most of the younger generation don't like the classroom situation,
> they prefer to be able to jump online and do everything online. (R5)

> Of note however, e-learning was also being advocated as an answer for

engaging older age groups in the learning environment. One interviewee asserted that older workers did not enjoy long periods of face-to-face instruction and therefore use of technology in the learning environment was a valuable tool to ensure variety:

> You can't hold someone captive for even a day when they're 50, 55. You just
> lose them too quickly if it's just blah, blah, blah or preaching, and the more
> things we can use [the better] (R2)

> This interviewee was referring specifically to the use of e-learning in the

classroom as an alternative to face-to-face instruction. These two interviewees refer to significantly different applications of e-learning. The first is advocating the use of e-learning as a standalone form of learning that is geographically dispersed and available on demand to individuals. The second however was advocating the use of learning technology as a means of "breaking up" long sessions of presentations in a face-to-face training situation; something that may also be addressed by others forms of activity. In both however, it was of note that the interviewees related the need for technology use in the learning environment to the age of learners. In fact, the second interviewee explained the use of e-learning within the more traditional classroom as the first step in introducing particularly their older learners to use of technology as a tool for learning:

> ... we've got a lot of people wouldn't know even how to turn a computer on,
> and what we do is we've introduced little bits and pieces of teaching through

our safe working rules when they come in [to the classroom], and … guide

them through the internet, or intranet, to find where policies and procedures are

… (R2)

Whilst age did feature in data gathering with all five interviewees, it is also important to note that it was not the primary focus of those interviewed in any of the case organisations. They discussed age often in conjunction with other worker characteristics such as learning styles, extent of computer use, and access to technology in the workplace. However, they were also conscious that much of their assumptions about these factors were based upon exposure to individuals in the workforce rather than any wider empirical data available to them. One interviewee acknowledged that workers who did not use computers within their job should not be assumed to have no technology skills and knew of some who were extensive users outside of the work environment, trading shares online and participating in advanced online gaming and simulations. On the other hand, they had also experienced situations where younger workers, even though using many of the newer technologies, were not necessarily comfortable or able to use e-learning in the workplace without considerable support.

In answer to the second research question, it seems that although age may feature in the equation when using e-learning in the rail industry, the issues are far more multifaceted than the consideration of age alone. The case organisations have all experienced both advantages and barriers when implementing e-learning and recognised generational differences as one factor in a complex web of considerations. They all had plans for enhancing and expanding e-learning offerings in the future and therefore the third research question addressed these plans.

Future use and potential to engage different generations

The final research question focused on the potential of e-learning to engage the different generations of learners in the rail industry. All interview participants were looking to the future and predicted that the use of e-learning would continue to grow in their organisations. They

saw the potential for engaging with younger learners who are accustomed to technology whilst also believing there may be ways to engage with the older generation who may not be as technologically literate. They saw an opportunity early in employment to build skills in the use of technology for learning:

> You know, I suppose what would probably be good in the futuristic world would be part of their induction, no matter who they are, is see if they need computer support and start them off and give them some basic computer knowledge. (R2)

It was a common approach to look to the use of e-learning for the younger generations even if they were not involved in roles that typically used computers as a common tool of their trade. Two of the organisations were already using e-learning intensively with their apprentices, recognising the importance of demonstrating contemporary technology use:

> When we went to [an e-learning provider] and did the training on what the very simple tool that we've got can produce and he [the competency manager] thought there's a lot of things that he could use to improve [like] not bringing the apprentices in [centrally for training]. They're all over the state. It's time and it's costs … They do Certificate IV or V in Information Technology as part of their course, as part of the signalling, so they're better at it [using technology] than me. They're very good. So there's no issue with them … (R1)

In some cases, they saw the use of technology in the learning environment as a demonstration to potential employees in younger age groups that they were "keeping up with" contemporary trends:

> Also becoming an employer of choice, providing more innovative ways of providing training, learning and development for the younger generation to try and move them in. (R5)

The interviewees also recognised that e-learning offers a way to engage a variety of learners and importantly, did not see it as an answer to all training; instead, they favoured the use of blended approaches that provide wider appeal.

But that sort of approach is what we're looking for. If you've got that blended, combined approach in terms of good change solution, good support solution as well as the training in between and a blended solution, you're going to start hitting everybody's learning styles, everybody's preferences. (R3)

There were clear efforts being made to overcome negative prior experiences with e-learning to provide learners with a vision of how e-learning could be used in the future:

People in depots are finally getting computers in their depots so that they then have access to those sorts of things [but], all they've seen is terrible online learning that was a glorified PowerPoint and they weren't very happy with it. Then they see these new things and they are excited again and start to generate ideas and even working with a few people in the business to develop these sorts of things and generate some ideas with them and share some ideas that we'd like to do. It is already causing a bit of a buzz around new products. (R4)

Assessing the potential of e-learning to serve the rail industry can be extremely difficult and complex in terms of balancing the demands on employees and employers. However, it was also apparent that the L&D practitioners intend to further the use of e-learning, particularly to engage younger learners who are more accustomed to the use of technology in everyday life. Just as apparent, though, is the potential for using e-learning in some situations with other workers.

Recommendations for practice

The results of this exploratory research offer a number of implications for L&D practitioners seeking to implement e-learning in organisations with a traditional workforce that encompasses a diverse range of ages, roles and levels of technological literacy.

The first notable issue for all the L&D practitioners was that they were often required to make assumptions about the workforce and level of technological literacy based upon estimates and experience rather than hard data. It was very clear that there was a level of curiosity about the extent to which employees were using computers outside of the workplace and whether this opened up the possibility for wider use of e-learning. Having data about the workforce in terms of technological literacy would assist L&D practitioners to identify the potential for e-learning use in the wider workforce.

The findings also reinforce the need to consider different groups of employees rather than the workforce as a whole when planning for the use of e-learning. Some of the case organisations were very clearly targeting only specific groups of employees for e-learning; those who had easy access to computers for example. One organisation had done a stocktake of the computers in the organisation to identify those employees with individual access to this technology and chose them as the target group for the first round of e-learning implementation. Whilst plans were in place to roll out additional hardware for shared use, the organisation took a staged approach whereby "early wins" were key to future widening of e-learning offerings. Another organisation had made the decision however that certain groups of employees were not going to be offered e-learning in the short to medium term because of problems with technology access and lack of broadband in remote areas of the state.

In relation to the younger generation of learners and whether e-learning is appropriate, the findings offer a warning. Just because learners may be considered "digital natives" does not mean that they know how to learn using technology. It is important for L&D practitioners to

understand the technology being used and how, to ensure that e-learning will be applied appropriately. For example, for the many employees already embracing mobile technology, e-learning that utilises this type of equipment may be more appropriate than that which uses personal computers.

Finally and most importantly is the finding that e-learning is not believed to be the answer to all learning needs. In all case organisations, the L&D practitioners were very aware of the range of drivers behind the interest in e-learning; cost reduction, reduction of travel time, increased ability to maintain compliance with changing legislation and workplace requirements. These were not always relating first and foremost to the most appropriate delivery mechanism for the learning required, and therefore the L&D practitioners were conscious of the need to ensure, regardless of delivery mode, the design of learning was fit for purpose. In all cases, the L&D practitioners were advocating the use of blended approaches that capitalised on the benefits of e-learning and provided the opportunity to enhance more traditional delivery modes.

Conclusion and future research

This research aimed to investigate the use of e-learning in a traditional industry containing a large element of blue-collar workers to determine the current usage, the age-related issues being experienced and the potential use of e-learning to engage different generations of learners. The research provided an opportunity to analyse current and potential e-learning practices of geographically dispersed and varying sized rail organisations from across the Australian continent. The research provided an opportunity to gather information from L&D practitioners responsible for e-learning implementation, backed up by demonstrations of systems and use of organisational data. To ensure views of all stakeholders in e-learning, future research should aim to gather empirical data from the employees of such

organisations about their previous experience, intent to use in future, and expectations and perceptions of e-learning.

The literature points to the widespread adoption of e-learning across education, government and commercial sectors (Australian Flexible Learning Framework, 2010). However, organisations must ensure that e-learning is not being adopted simply "because we can", but because it facilitates effective learning that will result in genuine business outcomes and return on investment. With rapid change in all types of working environments, there is an ongoing need to swiftly train and retrain people in new technologies, products and services. Ardent proponents of e-learning as an approach to employee training suggest a wide range of benefits to the use of technology in training (Wellman, 2007). When considering the potential effectiveness of e-learning, the recognition of an ageing workforce and the fact that many of the current employees are older workers has weighed heavily on the minds of those interviewed for this research. Concern was expressed that the older element in the workforce was not prepared for the widespread use of technology in the learning environment, and that this may alienate a large part of the workforce. However, it is also acknowledged that to assume all digital immigrants are uncomfortable with technology is a dangerous supposition.

The alternate concern, and perhaps more pressing for the sustainability of the rail industry, was the fact that many younger employees are very comfortable with the use of technology, and are, in fact, often more comfortable using this medium to learn than they are with other approaches. Further, this generation of younger employees is not having its training expectations met. This poses a challenge for rail organisations; they must be seen to be "keeping up" with technology, and find ways to better capitalise on the burgeoning use of technology by their younger workers both in and outside of the workplace (Australasian Railway Association Inc, 2006). The research has identified that there are barriers to the

adoption and use of e-learning across all generations, and the problem for management is to

balance the learning preferences of all employees while harnessing the potential of e-learning.

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Table 1. Details of case organisations

Case	Approx no. of employees	Employee Locations*	E-learning approach	Organisational Background
R1	1,400	Across the state – geographically dispersed	In-house stand-alone e-learning management system	A large regional public transport operator, R1 served over 10 million train and coach passengers in 2009/10 financial year. This company operates approximately 1500 train services each week, and more than 500 coach services that connect the rail network to regional state communities where trains don't operate. R1 provides access to several thousand kilometres of rail track which is used by mixed traffic (passenger and freight services). Many staff of R1 live in rural areas of the state. [sourced from the corporate annual report 2009-2010]
R2	720	Across the state – geographically dispersed	Open source e-learning management system (limited integration to HRIS) Some outsourcing to an external e-learning provider	R2 employs people in fields diverging from customer service, light and heavy rail drivers to a range of engineering and trade disciplines. Over the financial year 2008/9, R2 serviced approximately 15 million passengers. [sourced from the corporate annual report 2008-2009]
R3	10,000+	Across the state – geographically dispersed	New learning management system currently being sourced In-house development tools Outsource most e-learning development	This organisation provides city as well as country services. There are over 100,000 kilometres covered by city based trains and in the financial year 2009-2010, over 250 million passengers used the city trains. This company also services several hundred country destinations including interstate. In the financial year 2009-2010 almost two million passengers made a journey on the trains of the country fleet operated by R3. [sourced from the corporate annual report 2009-2010]
R4	10,000+	Across the state – geographically dispersed	Internal fully integrated with HRIS	A large integrated transport provider in Australia, with a workforce located nationally in several hundred locations. This company operates several thousand kilometres of track and runs more than a quarter of a million scheduled services, both passenger and freight services. In the financial year 2009-2010 over 50 million passenger trips were made. [sourced from the corporate annual report 2009-2010 and the corporate website]
R5	1,400	Mostly metropolitan but some rurally based employees	In-house stand-alone e-learning system	R5 was established through the amalgamation of several different transport organisations and now operates a number of major services. In the financial year 2009-2010, more than 100 million passengers boarded their transport services in the metropolitan area. Their coach and rail passenger services to regional areas cover several hundred locations in the state. In the financial year 2009-2010, almost a quarter of a million passengers boarded this service. In the same timeframe a significant number of students were carried by the school bus services also operated by R5. [sourced from the corporate annual report 2009-2010 and the corporate website]

*Although R1-R5 are all noted as being "across the state", each represents a different Australian state.