



Supporting Adults to Address Their Literacy Needs Using E-learning

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Abstract

Many adults need help with literacy learning. This is extremely challenging for the tertiary education sector and workplace-situated learning organisations. E-learning may be an effective and efficient way to improve the delivery of teaching of basic skills to learners. Our research study included five embedded case studies within one tertiary institution, and a series of stakeholder interviews with representatives across New Zealand. The study found that e-learning opens up greater interaction between adults' study, work, home, and community environments, simply because the learning environment can be extended into those places.

Keywords: adult learners; e-learning; education; literacy, language, numeracy (LLN)

Introduction

The 2006 Adult Literacy and Life Skills (ALL) Survey (Satherley, Lawes, & Sok, 2008) showed that New Zealand, in common with the Australia, Canada, and the United States, has approximately 15 percent of adults with very low literacy levels and approximately 50 percent who are missing some of the skills they need to successfully accomplish the literacy tasks common in today's society and economy. This lack of literacy skills can adversely affect adults' chances of being employed, earning a good income, and helping their children to succeed in education (Earle, 2009; Statistics Canada, 2008). In New Zealand, the Tertiary Education Strategy 2010–2015 (Ministry of Education, 2010) strongly advocates improving low levels of literacy for adult learners. However, motivating adults who have not succeeded in acquiring appropriate skills in reading and writing proves challenging because many of these adults have experienced "points of discouragement" (Byrne, 2007) that have led to failure in their literacy learning. This has led to alienation from learning and lack of confidence in their ability to read and write, which can cause anxiety and lead to defeatist strategies. Breaking through this barrier requires a complex range of strategies. We suggest, in this paper, that using e-learning technologies can help many of these adults to find courage and motivate them to become 'second chance' learners. For many adults, the opportunity to undertake study that is associated with e-learning can provide the opportunity to overcome their 'shame' of repeated underachievement in literacy, because they can refer to their classes or study as computer or ICT learning (Davis, Fletcher, & Absalom, 2010). Furthermore, e-learning allows literacy learning to occur in unique and motivating ways that were not part of the schooling that these adults experienced.

The large number of adults who need help with literacy learning (Earle, 2009) is extremely challenging for the tertiary education sector and workplace-situated learning organisations in many countries. E-learning may be an effective and efficient addition to the present menu of options that countries may consider in today's multi-literate society (Yelland, 2010). Only a few tertiary education organisations or workplaces in New Zealand have fully developed e-learning programmes for adults. Previous research (Benseman & Sutton, 1999; Benseman, Sutton, & Lander, 2005) emphasised that these challenges can be met and that adults do acquire literacy when well-prepared tutors use deliberate teaching strategies.

E-learning offers a way to structure and support learning (Mellar et al., 2007). Tasks can be made relevant to everyday life and within workplaces, where the need to have sound information literacy and numeracy skills is becoming more and more important. The variety of new literacies available in workplaces and in everyday life needs to be recognised and used to address the interfaces that can occur between literacy learning and technology (Lankshear & Knobel, 2003). This need to align teaching and learning to current contexts was highlighted in the study by Linehan and Sheridan (2009) who, after examining 433 courses in workplace learning situated in seven higher education colleges in Ireland, contended that an attitudinal and cultural shift is needed to overcome the over-reliance on traditional classroom-based programmes.

Another important factor to consider is how to encourage and motivate adult literacy learners because many adults with literacy needs are working and not able to attend courses. Many such adults do not recognise their own need for this support or feel too ashamed to seek help (Fletcher & Williams, 2008). E-learning, particularly when blended with face-to-face support, has the potential to offer these people more flexible and independent learning opportunities. Learners can learn in ways that fit their individual learning needs and life circumstances.

Our research on how e-learning can support literacy learning for adult students was part of a wider study for the New Zealand Ministry of Education. Over 2 years, the study involved five major activities: an extensive international literature review; online seminars involving international experts; over 30 stakeholder interviews; case studies; and a synthesis of the research (Davis, Fletcher & Absalom, 2010; Davis, Fletcher, Everatt, et al., 2010).

Before presenting our findings in this article, we provide a brief overview of our understanding of the terms 'e-learning' and 'adult literacy' in the 21st century.

Our definition of e-learning

E-learning is a term with many definitions and so is defined here as learning that is facilitated by using computer-related technologies. Stand-alone computers and all they offer, such as internet access, are probably the most prominent of these technologies, but e-learning also encompasses hand-held data storage and transmittal devices including mobile phones. Distance and autonomous self-study is of particular interest.

Tertiary e-learning programmes often blend the use of computer-related technologies so that learning can take place both with and without the tutor's presence. Blended application of computer-related technologies can be designed to fit in with learners' workplace- and home-based experiences and activities. For example, distance learning in New Zealand workplaces commonly requires learners to study workbooks and complete exercises, and that approach is supplemented with periodic visits by tutors. However, this mode of workplace learning can be usefully extended through e-learning. Directed use of web-based resources at home with support of immediate and extended family is just one example.

Adult literacy in the 21st century

Winch et al. (2007) define literacy as making and sharing meaning by constructing and interpreting text in oral, written, graphic, or electronic forms. This includes all facets of literacy in today's society, such as social literacy, critical literacy, and technological literacy. All aspects of e-learning and computer-related skills are part of literacy in the 21st century. Thus, literacy development is embedded in the context of our everyday lives (Wing Jan, 2009). Many researchers (see, for example, Appleby & Bathmaker, 2006; Pannucci & Walmsley, 2007; Prins, 2007), contend that being literate and being able to read are substantial foundation blocks for capable and independent citizenship. This is especially so, given that in today's world more occupations demand such skills (Reardon, 2010).

Ruddell and Unrau (2004a) argued that literacy learning should be conceptualised as a meaning–construction and meaning–negotiation process and thus viewed it from a socio-cognitive perspective. They claimed that students' prior life experiences form their beliefs and knowledge. They suggested that the tutor's/teacher's instructional beliefs and philosophy (which include their sociocultural beliefs, values, and motivation to engage students) influence their instructional decision-making processes. Additionally, students bring their own experiences and cultural knowledge to their literacy learning.

Professional development

Reardon (2010) argues that, as technological change is occurring at an unprecedented rate in the workplace, a key to developing and encouraging the learning culture is to bring another level of assistance to the concept of learning organisations. As technological innovations are continuously being incorporated into day-to-day work activities, effective professional development programmes can affect the learning culture within an organisation. These programmes may occur over relatively long periods of time, have all staff contributing to and partaking in developing plans for improvement, have large investments of time and capital, and present sound theoretical understandings of the topic under consideration (Drago-Severson & Pinto, 2006; Fisher & Frey, 2007; RAND Reading Study Group, 2002; Timperley, Wilson, Barrar, & Fung, 2007). Furthermore, Gavelek and Bresnahan (2009) contend that sustained professional development needs to be facilitated by instructional leaders who allow teachers/tutors to negotiate meaning and develop collaborative communities of effective literacy practice. When shaping these opportunities for transformative learning by using people's experiences, Scaratti, Gorli, and Ripamonti et al. (2009) identify the need for staff to be counselled, mentored and tutored in situated contexts. They suggest learning should be viewed as situated relationships and interpretations where people are reoriented to sustainable relational ecologies.

The aim of this paper is to examine ways in which tertiary educators and/or workplace learning organisations can support adult learners who need to develop basic skills in literacy. We provide evidence to support our view that motivation and engagement in literacy learning can be improved. This is particularly the case when considering a socio-cognitive perspective (Ruddell, 2004; Ruddell & Unrau, 2004a; 2004b). When e-learning is embedded in literacy learning, the context relates to the students' backgrounds and workplace needs, and the wider family structures support them, these students are more likely to succeed.

Methodology

Our research study included five embedded case studies in one tertiary institution and a series of stakeholder interviews with representatives across New Zealand. This approach provided opportunities for the research team to explore the current status, plans, benefits, and barriers

related to e-learning for literacy in organisations or business, including tertiary providers, work-based tutors and employers.

Case study

Findings for the case study in a New Zealand polytechnic are presented first. Case-study methodology was adapted from the success case method (Brinkerhoff, 2005). This entails focusing on a case selected to illustrate successful features of practice. An urban polytechnic was becoming increasingly known for its innovative endeavours in the provision of quality education. The criteria that we used to select the polytechnic for our overarching case study and the embedded case studies, included as many aspects of good practice as possible that we identified in the literature available at the time the research was proposed. We accordingly looked for an institution with programmes and courses that had a range of the following attributes:

- includes e-learning that has been in place for at least 2 years and has documented evidence of outcomes
- targets students from groups of people who are either in work or about to begin work
- has staff with relevant qualifications and expertise in adult education, elementary education, community education, and/or educational administration
- offers teaching based on sound principles of adult learning
- connects its curriculum to students' needs and interests
- provides (to some extent) content in collaboration with a range of relevant agencies such as schools, employment agencies, and educational groups
- has explicit and clearly structured modes of teaching literacy and/or numeracy and provides individualised tuition
- uses individual learning plans
- has high expectations of students
- provides students with formal credit and accreditation for their study.

We conducted interviews with staff and undertook observations in all areas of the selected polytechnic where e-learning or mixed-media learning was being used in foundation programmes at the time of our investigation. We selected only areas of the polytechnic with programmes or initiatives directed at New Zealand adults with literacy, language and numeracy (LLN) needs. Six areas were identified and all were selected for further investigation:

1. The ESOL centre in the library (including a 1-day class)
2. Trades faculty (including two trades classes)
3. Food and hospitality faculty (including one programme for apprentices)
4. Māori and Pasifika faculty
5. Adult literacy (including one evening class)
6. Applied sciences and health faculty (including one pre-health course).

Ethical procedures were followed according to the ethical policies of our university and the selected polytechnic. We formally interviewed 34 people including 10 leaders, some of whom were also managers and tutors; six tutors (two literacy, two ESOL, two numeracy/trades); and 18 students (seven adult literacy, four ESOL literacy, four maths, three trades). The students represented a range of backgrounds, skills, and needs, including ESOL, low literacy, behavioural and physical disabilities, various ethnicities, ages (late teens to 50s), and subject areas (from trades to professional).

Staff interviews

The staff interviews were conducted by one or more of the three researchers. Face-to-face staff interviews occurred in a variety of situations, including interviewees' offices, classrooms, a café, and labs. On a small number of occasions, other people were present, or the interview was conducted by phone. Potential questions covered several areas, including (but not restricted to) the nature of good practice in e-learning, work-based learning, success factors for e-learning, impacts on learners, motivation of learners, barriers to learning, and the value of a free, online site for developing skills. Interviews were semi-structured, allowing for flexibility to follow new leads or ideas raised by the interviewees. All staff interviews were transcribed. Each interviewee received a copy of their transcript for checking and amendment.

Student interviews and observation

The student interviews, which were also semi-structured, were conducted by one of the two researchers or the research assistant. We interviewed students either by phone (after they had told their tutors that they agreed to participate in the study) or face to face in their labs or classrooms. Most student interviews were done on a one-to-one basis. However, we conducted two group interviews in the adult literacy class and one in the English Speakers of Other Languages (ESOL) Centre. The questions sought students' reasons for wanting to improve their skills. The questions also focused on employment aspirations, current or past use of e-learning, and whether or not the student would use a free, public online LLN site. All student interviews were transcribed, but it was not possible to have students check their transcripts because of their literacy limitations. In most cases, we considered that it would be unreasonable to ask these students to read and amend their transcripts.

We also completed studies of classes engaged in learning. We observed the members of three classes as they worked to develop their literacy or numeracy skills. Each observation was made by one of the two researchers and the research assistant. To protect student identities we did not take photographs during class sessions but made some line drawing sketches at these times. We also took some photographs of classroom layout and resources. During each observation, we wrote field notes and asked for and received handouts and copies of teaching materials. We also had access to the polytechnic's online e-learning environments, including observation of courses in its learning management system (LMS), Moodle. The case study is presented in Davis, Fletcher & Absalom, 2010).

Stakeholder interviews

We conducted interviews with stakeholders representing all sectors involved in adult literacy learning, including a wide range of employers, tertiary providers, and policy makers in New Zealand. Emails and/or phone calls were made to 117 individuals, some within the same organisations. The purpose and nature of the research was outlined and they were asked whether tuition used e-learning, distance learning, or mixed media.

Thirty-four stakeholders went ahead with interviews, either with one of the researchers or with the research assistant. Occasionally more than one person in the organisation was interviewed at the same time—these are treated as one stakeholder interview. Most interviews were by telephone at a pre-arranged time that suited the interviewee, with the remainder face to face. The face-to-face interviews occurred when the researcher visited locations outside the research team's home base and were often on the stakeholder's premises. This served to contextualise comments and occasionally gave an opportunity to observe products or processes.

Analysis of data

The analysis was undertaken in several stages. First an international literature review was used to identify themes from the literature relating to raising literacy skills of adult learners by using e-learning (Davis, Fletcher, Everatt, et al., 2010). These themes were defined, as precisely as possible, in coding categories (Fraenkel & Wallen, 2006). A research assistant then took this list of categories/themes to analyse and segment the data in the transcripts against these categories (Watling & James, 2007). Davis, one of the researchers, then conducted a second order of analysis of the interview transcripts using axial coding (Neuman, 2003) to look for concepts and themes that linked with one another and/or formed clusters. This provided us with a denser web of support for emerging key ideas in the qualitative data.

Findings: Illustrations and challenges

The overarching message of this article and our research is that e-learning can motivate adult learners who have previously been unsuccessful in their literacy learning. E-learning is relevant to and useful for most adults with literacy learning needs, as long as the learning programme is carefully designed to fit each individual's needs and lifestyle, their proficiency with computer-related technologies, and their reading literacy. E-learning can also help provide the time and intense practice needed to develop their literacy.

Another important finding is that realising the potential of e-learning depends on ongoing professional development for tutors and others who support learners, including organisations where programmes and resources are developed, such as colleges and private training providers. Access to training in the workplace, at home, and in the community requires development of infrastructure and support from employers, family, and friends.

Proficiency with relevant computer-related technologies is a central feature of 21st-century literacy skills. It includes the ability to selectively access and use resources on the web (Mellar et al., 2007). Given the prominent place that information and communication technologies (ICT) now have in most businesses, there is an increasing need for employees to have broad-based problem-solving skills, including those associated with computer-related technologies. Consider for example, employees and citizens who are expected to find and use information on the web, such as completing forms to submit them for review as part of seeking a job or living accommodation.

Another rapidly developing expectation of adults in the 21st century is the ability to access training via e-learning. Because e-learning programmes can transcend the barriers of geographic location and time, they can be customised to meet the work and community-based learning needs of students who are unable to readily access traditional face-to-face learning provision (UNESCO, 2006). It is not surprising, then, that employers are increasingly using e-learning to update the skills of their workforce, and that most tertiary providers now enhance their programmes with e-learning. These developments underscore the need for adults to have digital technology skills as part of their 21st-century literacy (Smith, 2009).

In addition, computer-related technologies provide a relevant learning context for adults who want to improve their literacy, and help alleviate some of their anxiety about literacy learning. Adults who lack literacy are often embarrassed by these needs, and take care to conceal them with excuses such as not having their reading glasses at hand (Thomas, 2010). Tertiary-level students report that their fear of attending and completing a literacy course would lessen if they knew the course offered a positive and non-threatening learning environment (Fletcher & Williams, 2008; Nash & Kallenbach, 2009). If these adults can also tell others they are studying a computer course rather than enhancing their literacy, their embarrassment is alleviated.

Simmons (2002), for example, found that literacy programmes which included development of computer skills had increased enrolments.

Adults with literacy needs are attracted to learning activities that involve computer-related technologies because these tend to have immediate relevance to their lives at work and beyond (Davis, Fletcher, Everatt, et al., 2010). For example, a workplace tutor we spoke to supported three adults to improve their literacy by engaging them in a project on waste in their department. The word-processed report that the three employees submitted to their manager included relevant photographs. They had used their tutor's digital camera to photograph areas and techniques that contributed to waste in their respective workplaces. The opportunity to take photographs not only helped the employees produce a useful report but also supported the development of their literacy skills and their ability to use computer-related technologies.

Many adults do not have access to computers at work, and some have had little exposure to computers in general. This situation is especially true for older adults and adults who have been out of the workforce for some time. Tutors we interviewed told us that such adults sometimes fear they will damage the computer or make it crash. But although fearful, these adults generally appreciate the need to develop computer-related skills. These tutors are consequently providing these adults with intensive support that enables them to become comfortable with computers before they undertake literacy learning via e-learning.

Motivating literacy learning using e-learning

To provide a context in which to situate further discussion of motivation, we now provide a brief synthesis of research according to the four main aspects of language teaching:

1. **Writing:** The obvious tool here is the word-processing facility of computers. This facility includes useful language tools such as dictionaries, thesauri, and spelling and grammar checkers. Having learners incorporate photographs in their texts also supports literacy development, particularly if text and illustrations are drawn from the learner's own life experiences. Using drag and drop to answer online test questions and then receiving immediate feedback increases learners' engagement with the activity and allows them to assess their own progress and needs. Grammar software is best suited to more advanced second-language students. Drill-and-practice software and computer games can be successful, but only when carefully targeted to address individual needs. However, when enjoyed and successfully completed, high-interest computer games can motivate learners to try more relevant games.
2. **Reading:** A variety of glossing formats can be used to improve a learner's understanding of the meaning of words and phrases. A gloss can take the form of a pop-up box containing a text and/or relevant pictures and/or audio. Vocabulary learning can be enhanced by analysing multimedia and specific resources on the web. Embedded audio files are valuable not only for aiding reading skills but also for opening up computer access to learners who are still developing their keyboard skills, or who have not yet developed sufficient English-writing skills. Numeracy activities can also be aided via audio provision.
3. **Speaking:** E-learning tools can help learners to develop oral presentation skills. For example, learners wanting to improve their pronunciation can use audio analysis software to compare themselves with native speakers. Voice recognition software may be used to turn speech into text as long as the words are clearly articulated. However, in our experience, voice-recognition systems generally recognise less than a quarter of English spoken by non-native speakers of the language. It is therefore important to test this tool before using it in learning activities. Carefully structured use of online chat and

discussions through email and online discussion forums, as described earlier, are also relevant here.

4. **Listening:** Digital voice recordings are widely used by language tutors. The web contains many relevant resources, including radio and television broadcasts with commentaries (see information regarding the web as a medium above). Some computer games, such as Word Shark, include an option that allows the user to replay the audio component (Davis, Fletcher, Everatt, et al., 2010).

However, the motivational value of these strategies depends on their fit with the adult in terms of literacy and study skills. Those few adult learners who endeavour to develop their literacy, and who learn online without tutor support, tend to be well organised and to have good access to the necessary technology. They also tend to need relatively little assistance when developing their literacy skills, because they have lost these skills through lack of use rather than never having developed them. Some adult learners who learn online have access to informal tutors, including family and workplace colleagues.

In contrast, adults with beginning literacy levels need intensive face-to-face support (Davis, Fletcher, Everatt, et al., 2010; Lopez, Litster, Vorhous, & Salter, 2007). For these learners in particular, a learning approach that fits their respective lifestyles can enhance motivation to persist (Lopez et al., 2007). E-learning is particularly accommodating of learners who cannot easily access face-to-face tuition, such as those in rural communities (Nash & Kallenbach, 2009; UNESCO, 2006). Family can offer the adult learner important motivational support that might include tutoring. Activities related to everyday life challenges and family can also support e-learning because they provide strong motivational contexts. An example is grandparents who are able to read to their grandchildren and offer these youngsters support as they develop their literacy. Mellar et al. (2007) allude to this type of motivation in their description of a promising e-learning course in the United Kingdom that focuses, as a means of developing adults' literacy, on helping these adults to support their children's learning. In New Zealand, Benseman and Sutton (2007) found that family literacy partnerships bring clear benefits for the adult learners and for the children in their families.

Outreach and open-access centres are effective in increasing motivation by improving access to education and training, particularly for adults who have been traditionally underserved. Appleby and Bathmaker (2006) and Pannucci and Walmsley (2007) note these benefits and point out that they often extend beyond the individual. Learning with the support of the church is common in the Pasifika community. One of our stakeholders described a project in which members of a Samoan community had access to computers in a church hall so they could build their literacy skills in a non-threatening environment.

Our polytechnic case study has many illustrations of the motivational effect of e-learning through the creation and ready availability of a wide range of e-learning resources. For example, several tutors of trades perceived reduced motivation of adults who had poor literacy due to their inability to make notes and use industry terminology at an early stage. They overcame such "points of discouragement" (Byrne, 2007) through ongoing use of ICT to create materials (including numerous images) for these adults with low-level literacy. Among the many innovations we observed were presentation slides including pictures of processes and techniques, and test questions complete with drag-and-drop answers (accessed through the polytechnic's online LMS), and an innovative computer simulation of the complicated task of laying out a building site. The simulation readily motivated young male learners, who were highly engaged by its game-like interface. This provision increased student retention, indicating it had overcome some of Byrne's 'points of discouragement'.

Mobile learning refers to learning activities made possible by using lightweight hand-held devices, including mobile phones and portable audio and video players and recorders. Mobile learning is a relatively new form of educational provision. It has the potential to extend learning into homes and workplaces, but it can be challenging because the learning takes place outside locations traditionally used for study. Successful mobile learning accordingly involves careful negotiation among designers, instructors, adult learners, and collaborating employers. This collaboration can ensure that expectations relating to literacy development remain realistic and ensure good fit with workplace routines and safety.

Manufacturers are increasingly using mobile devices on the factory floor to guide and monitor processes. Pictures, audio, and/or text instructions can be used for tasks in the workplace or at home, thus providing adult learners with opportunities to develop skills through practice. Adults with disabilities that limit their ability to learn can use mobile devices to increase their feelings of control and independence (Smith, 2009).

Our polytechnic case study of a programme for modern apprentices describes young apprentices, who are internet savvy and proficient with their mobile phones, successfully gathering evidence in the workplace to fulfil the assessment component of their vocational programme (Davis, Fletcher & Absalom, 2010). Using the mobile phone camera temporarily reduced the demand on their writing skills. In addition, the tutor texted multiple-choice questions relating to course content to the apprentices' mobile phones, prompting greater engagement with the theoretical aspects of their programme. This was consolidated with on-campus work on their ePortfolio of evidence organised by industry standards. Innovative practice from our case study illustrates how digital technology can be used to motivate students to undertake formative assessment in workplaces.

Reservations

There is no doubt that introducing and integrating e-learning into adult education and training is a complex process. Many factors have to come together to ensure that e-learning programmes are successful for adults with literacy needs.

We consider that the success or otherwise of programmes that use e-learning to support adults wanting to develop their literacy can best be predicted by considering these ecologies from within an evolutionary framework (Davis, 2008; Davis & Fletcher, 2010). Davis describes ecologies of people in and around the classroom who all contribute to the success of learning. The e-learning that takes place is supported by four tiers: bureaucratic entities, such as the Ministry of Education; commercial interests, including telecommunication companies; professionals in tutor-training organisations and professional societies; and political agents at all levels of society, from the local community to the international stage. Amidst this framework, teachers are the key players: they are the essential individuals who keep the edifice functioning.

E-learning also brings the benefit of opening up greater interaction between adults' study, work, home, and community environments, simply because the learning environment can be extended into those places. These extensions of the locations where learning takes place stretch out the opportunities and time that adults have available to develop their literacy. The time needed to develop such skills can take hundreds of hours, yet this factor is often underestimated. Mobile learning that encompasses computer-related technologies continues to expand the options, but this facility also increases the complexity of e-learning development within and across organisations within the e-learning ecology.

Conclusions

The often intensive and challenging nature of developing adults' literacy explains the need for organisational development and commensurate professional development for staff. Resource development is also vital. E-learning can also be used to support these developments at both local and national levels, while web-based technologies provide educators with opportunities to share ideas and resources through partnerships and learning communities, and across geographic boundaries. This is what is needed for e-learning to be most effective for adults with literacy needs in New Zealand and globally.

E-learning can be used to motivate, recruit, and retain adults with literacy deficits. We expect to see both e-learning and literacy support co-evolve within an increasing range of ecologies where adults have access to e-learning. Key to this evolution will be professional development for tutors, an increase in resources, and support that fits the diversity of adults with literacy needs.

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