Digitising our learning: An innovative trial of a new teaching technology.

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ABSTRACT

This paper reports how digital technologies can be successfully incorporated into traditional teaching programmes to support the learning of a new generation of learners. It describes the introduction of an innovative learning venture with preservice teachers. A web-based platform called Lessonlab was piloted with four cohorts of preservice teachers approximately 600 students, of whom 25% participated in this evaluation. A special feature of this platform is its ability to house streaming video and a range of digital video analysis functions. Research was conducted to determine the effectiveness of this use of digital technology. Quantitative and qualitative data were obtained from participants, which revealed that the majority of participants benefited from this use of technology to support their learning. The study has relevance for all educators who are keen to use technology to promote effective learning and thinking for todays` learners.

INTRODUCTION

Every great age has been characterised by growth and change. In past eras, the agricultural and industrial revolutions had far reaching influences on the way people lived, learned and functioned in society (Burns, 2002). Currently we are in the early stages of a digital revolution that has impacted on every aspect of our lives. As educators we are key players in this rapidly changing world. Many educators are concerned about how to adapt and change their teaching to make it more effective for todays` learners. There is a growing realisation that there is a generation of learners entering our institutions that learn and think differently. There are several reports that indicate that traditional methods of face-to-face teaching are failing to motivate some learners in our institutions, particularly young males (Marsh, 2004; World-Bank, 2002)

This paper describes a pilot project utilising a learning content management system, which houses digital streaming video. A questionnaire and interviews were used with one cohort of learners to determine the effectiveness of this use of technology. Qualitative and quantitative data from this study revealed students attitudes to using technology to support their learning. A new learning management system called Lessonlab was used in a course of tertiary study for large cohorts of students. Design features of this system are described. Advantages of this system are described and problems encountered in the initial implementation are listed. Instructional strategies used to over come difficulties in this pilot study are shared. Future directions and some implications of using digital technology to support learning are discussed.

Characteristics of Generation Y learners

The current cohort of preservice teachers fall demographically into a group sociologists label as Generation Y. These students are mostly in the 18-25 year-old age range. Generation Y are the children of the baby boomers. They are the first generation to grow up with computers in their homes and schools (Sheahan, 2005). There are accustomed to having instant access to information. They use technology for communication, information and recreation. They can be visually orientated learners with very individualised learning styles (Buzan, 1995; Fogarty, 1997; Gardner, 2004; Lane, 2005).

The challenge for educators of the future is to provide authentic motivating learning experiences for our students. We need to conceptualise the transfer and expression of knowledge in different ways, in order to captivate the interest of these new learners. The hierarchies of knowledge transfer and the stratification between the educator and the learners are no longer clearly defined. To effectively engage today's` learners we need to reconceptualize our pedagogy to provide a seamless, flexible, interface between the learner and the learning.

Research on learning styles and cognition supporting the use of technology

Research in the realm of learning and thinking is claiming that individuals can learn more effectively if their individual learning styles are accommodated. The ongoing work of Gardner, Kornhaber and others in Project Zero at Harvard University reveals how teachers can use instructional strategies and assessment methods to incorporate the learning styles of the learners in their classes (Gardner, 2004; Kornhaber, Fieros, & Veenema, 2004; Morgan, 1997; Sheahan, 2005; Splitter & Sharp, 1995).

The theory of distributed cognition proposes that intelligence is not a single entity but can be an interrelationship or network of resources that an individual uses to solve problems and generate new

ideas. This moves beyond the notion that intelligence is a measurable entity contained within the head of an individual. The concept of distributed cognition supports the view that intelligence is an interaction between the innate abilities of individuals and the cultural environment. This includes learning-thinking tools, for example computers, PDA`s, MP3 players, paper and pens. It also encompasses references and stored notes in written or digital form. The network of people who can be accessed by the individual either directly or using technology adds to the functional collective intelligence of the individual (Resnick, Levine, & Teasley, 1991). An implication of this theory for educators could be that, by utilising technology efficiently and by giving the learners the skills and the tools to harness technology, we can increase the individuals` distributed cognitive network. This can have positive implications for the intellectual performance of the individual.

The rationale behind the use of videopapers and the selection of the Lessonlab online learning platform

A number of factors were considered in the design phases of this unit of work. The target group was predominantly Generation Y learners. Their specific learning needs and styles were incorporated into the instructional design. The unit of work contained a large amount of abstract theory, which students struggle to link to practice. The unit needed to seamlessly integrate technology as a platform for learning and as an interactive tool for demonstrating learning. All learning materials needed to be available twenty-four hours a day, both on and off campus. To appeal to a group of visual learners, the materials needed to have a bright attractive look and feel, incorporating pictures, graphics and authentic video footage. This prompted the use of a learning content management system (LCMS), which could incorporate videopapers and learning activities. These LCMS use digital servers to store learning materials allowing the separation of the activities and the resources (Oliver, 2001).

A videopaper combines research through the provision of active web-links connecting to academic journals, theoretical papers and authentic video footage incorporating a range of interactive tasks. Videopapers have been described by Olivero et al. (2004) as a new form of publication, which encourage the combination of the roles of researchers, teachers and learners as both knowledge generators and knowledge translators. By reconceptualsing our pedagogy to incorporate videopapers, we are responding to the changing learning needs of students who learn in new and different ways and prefer to be actively involved in their own knowledge construction.

The author investigated a range of methods of presenting the learning materials; ultimately the Lessonlab online learning platform met the instructional requirements for this unit of work. Lessonlab is an online learning platform that consists of a number of "lessons and "tasks" or "videopapers" (Olivero, John, & Sutherland, 2004). The Lessonlab platform incorporates a range of video analysis tools so that participants can demonstrate their transfer of knowledge by marking points in the video and writing their own analysis or commentary. The platform encourages participation in an online learning community. All participants can view the video and be exposed to the same learning experience. They can go to the online portal and post their responses. These responses can be shared and commented on by participating learners and teachers through the learning groups on the portal. Access to the portal and specific groups are password protected so can only be used by those engaged in the learning experience. The use of videopapers and online forums allow participants to be actively involved in a dynamic learning experience that evolves according to the needs and interests of the group. A key element of the videopapers used in this unit was the use of authentic video case studies.

The use of video case studies

The literature was researched to find indicators and key features to include in the development of these video case studies. The method of utilising video to promote authentic learning is widespread in teaching. An example of recent good practice is in the Timm`s study (Steigler & Hiebert, 1999). As a part of the design of the unit of work in this study, exemplary teachers in local schools were filmed as part of the project. Principles of good practice were followed when using video case studies. For example strict ethical procedures were followed, such as obtaining signed consent from all participants and the parents or guardians, of minors. Particular care was taken when using video case studies in an online environment, as aspects of clarity and stability of the image are crucial when the video is to be viewed in a small screen within a larger web-page (Lessonlab-Inc., 2000). A professional filming crew was used to produce high quality footage. The video footage was digitised using VPrism Software. VPrism software allows the viewing of both the video and the digitised text track, which is time linked to the video footage (Clarke, 2002).

The rationale for the use of digital video analysis

A dilemma faced by educators is how to integrate theory and practice. Traditionally there has been an invisible line dividing the theoretical component of courses of study and real life practice. This gap has been particularly evident in courses no curriculum studies and educational theory. The rationale behind using digital video in these courses for teacher educators is to juxtapose theory and reality by combining the visual image of a real teacher in a classroom and the theoretical constructs underpinning teaching practice (Olivero et al., 2004). Video has a long history of being incorporated into teacher education programmes with varying degrees of success (Perry & Talley, 2001). The use of video as purely a visual representation has certain limitations from an educational perspective. When the participant is required to passively view a selection of video, their active involvement and learning is limited. This use of digital video analysis allows the manipulation of video footage by the learner in the online platform. The learners insert marker points and commentaries to indicate their understanding and application of theoretical constructs.

The advances in technology that allow this digital video footage to be housed on a web-based portal and streamed on demand, allow for more active involvement of the learner (Steigler & Hiebert, 1999). In the Lessonlab platform the viewer has a great deal of control over his or her own learning. The viewer can decide when she wants to view the video, which section of video she wants to view, how often she needs to view the video to suit her own learning style. The viewer decides if she needs to see the text track with the visual image and the sound track, or if she prefers to just sight the text track. The learner can adapt the learning experience, to her own specific learning needs and preferences. The advances in digital technology provide a flexible learning environment to accommodate differences in learning style, tempo and modality. Another advantage of this use of digital video analysis is that the learner selects the sections of

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video to view and inserts marker points which link to an analysis that he has constructed. This gives the learner ultimate control and allows him to demonstrate that he has reached a point of knowledge transfer or bridging by linking the theory to practice. This platform has taken the control of the learning experience from the educator and placed it in the hands of the learner who can customise his learning experience to meet his pedagogical needs. This transforms the learning journey from one that is teacher controlled to one that is controlled by the individual learner.

Methodology used in the research

A combination of qualitative and quantitative research was used in this study. All the participants in one cohort of the course being described completed a questionnaire comprising 35 questions. The questionnaire gathered quantitative and qualitative data. The items collecting quantitative data used Likert Scales on the demographics of the group, information about their learning style, and ways in which the use of digital technology supported their learning style. A focus group was held with a group of six student volunteers from the first year preservice teacher cohort who participated in the course.

Discussion of the quantitative findings of this study

In these questions students commented on how they liked the flexibility of the course, in that they could complete the online components in their own time. The students enjoyed the range of contents of the course and the variety of the online activities. They felt it made them think and take responsibility for their own learning. They found the video clips interesting and relevant. Some students commented that doing the online tasks took too much time in relation to the percentage of marks allocated to the task. A general trend was that the Generation Y learners enjoyed learning using digital technology yet the few mature-aged students found the use of the online environment more stressful. Generally the mature-aged students made more use of the additional face-to-face support workshops offered and progressed well in the course.

Discussion of the qualitative findings of this study

The information collected in the focus group was analysed for trends and frequencies of specific words and phrases. The general consensus from these students was that they enjoyed using the interface. They enjoyed the bright look and feel of the portal and the inclusion of graphics and animations. They liked the flexibility that allowed them to access the materials at any time from a variety of venues. The main difficulties were concerned with access to technology. The students suggested that more training in navigating the web-based platform could be given at the beginning of the course. The students felt they needed more support by teaching staff during tutorial sessions and access to computers during their tutorial sessions. This would reduce the high cognitive load some students experienced when working in a web-based format for the first time. One student commented that it was the most difficult and challenging of the first year units that she had undertaken but that she enjoyed it as it was stimulating and challenging.

Limitations of the study

A limitation of this study was that the research was only conducted with one cohort of the students approximately 80 % of the one cohort completed and returned their questionnaires (N: 65). The demographics of this group were skewed being approximately 85% female. Thus these results may not be readily generalisable to the broader population yet are fairly

representative of the population of early childhood preservice teachers involved in this part of the study.

Problems encountered when implementing this project

This first problem was the inexperience of the teaching team with the digital learning platform. None of the teaching team had used this particular web-based platform before, as it was the first time it was being used in Australia. They had used other web-based platforms, for example the Blackboard online platform. The second and most significant problem was that of a lack of access to technology for the student participants. Many of the students did not have broadband internet access at home. In order to stream the online video content broadband or ADSL was needed. This learning platform was designed in the US where the majority of university students have access to ADSL technology.

The initial premise was that students would be able to access Lessonlab at the mega labs. The mega labs are large facilities, which provide computers for students on campus. They are maintained by the Universities Central Information Technology Services. However, shortly after this unit was started problems arose. It appeared that The Central Information Technology Services could not provide the technical support needed in order to run this web-based system. Lessonlab required changes to the security settings to allow the use of pop-up windows. Lessonlab also required a version of QuickTime currently not installed as part of the standard operating system by IT central. In order to make the changes required to run this system, IT central requested large sums of money, which were not in our budget. This meant that students could not use the Mega labs to do the work required by this unit.

The Computers that were configured to run the system were only in two computer laboratories on the campus. These rooms were also used to teach general tutorials, many of which did not require computers and were generally booked for the whole semester. Therefore students were only able to access these computers after hours or if a group that had booked the computer labs were not using the labs for any reason. This caused much anxiety and frustration from the students.

A solution was developed redress the problem of access to technology. The participants were provided with a computer disc containing the video files, which allowed students who had dial up Internet access to stream the video component from the CD. The CDs` also ran diagnostic tests to check the system requirements of the students` computers and help them to download the necessary software needed to run the system. A problem encountered was that it took a long time to get the CDs made, so students only received these fairly late in the course. These CDs will be available for use in the future teaching of this unit. An online help site was developed to answer student queries.

The analysis of online help site messages for participants in the courses

During the first semester that the Lessonlab platform was used, a help link was included on the site; it logged 700 messages during this time period (from all the units using Lessonlab during the semester). There were approximately 850 students logged on to Lessonlab during the semester, some of these using the platform in more than one unit. According to the analysis of help messages, the majority were referring to students who had forgotten their log-in codes or who had entered the incorrect log-in code. Many of these messages dealt with frustration due to a lack of access to the technology.

It is interesting to note that when the same unit was repeated in the following semester only 16 messages were received on the help line and only four requests for help by the unit co-ordinator. The units are now being offered for a third semester so it will be interesting to see if this trend continues.

An analysis of the Lessonlab platform by the coordinator of the teaching team

The Unit Coordinator reported that much of the stress for students could be minimised if students were given access to computers during their tutorial session and were able to negotiate the platform with the support of their tutors. There were many positive learning outcomes for the course participants: participants gained many useful ICT related skills, which will be beneficial in other courses of study. Many of the participants, particularly some of the females came in with very low levels of IT skills. Additional Lessonlab help workshops were run for those students, which helped improve their general confidence levels in the area of technology. The work produced by the first year cohort was of a particularly high standard. The tasks where they viewed videos of class teaching and had to compare and analyse teaching styles, had them working at a level not normally found in first year students. They were able to link the abstract theory with authentic examples of classroom practice and comment knowledgably on the instructional strategies utilised. This high level of reflection and reconstruction is not typically seem in the work of students who have only been at University for one semester.

The staff teaching the unit reported that their own ICT skills improved while working on this unit. The overall report by the teaching team was that despite the initial difficulties faced in the implementation of this new technology the learning benefits for the students were immense. However, improvement is needed in the delivery, access to technology and levels of support to students.

Implications of this project for educators

Although this paper describes an application of this technology for preservice teachers, it can be used in a range of educational settings. It could be used as an online learning tool for teaching a range of topics, when the inclusion of video or visually based materials would be beneficial. It could also be used for self-appraisal of live performances in drama or the arts or for self-reflection of professional practice for teachers. This platform could facilitate the development of online professional portfolios with annotated video footage and self-reflection.

Conclusions

In this era of rapid technological innovation the use of digital video in an online format can become a very effective teaching tool. The newest MP3 players have the facility to store and play video footage and the new generation of mobile phone and wireless devices can stream video. As educators we have a range of new instructional opportunities available to include in our teaching. The challenge to us all is how can we exploit these advances to benefit our learners and meet demands of learning and thinking in a digital age?

Acknowledgements

BIOGRAPHY

JENNY LANE *co-ordinates courses in post-graduate and preservice teacher education at Edith Cowan University in Perth Western Australia. She has worked for many years in the area of Special Needs Education with particular emphasis on how technology can enhance learning for all students. Her current research interests are in the area of promoting effective learning using technology to cater for students learning styles. She has been involved in this project using digital video analysis with preservice teachers for the past four years. She is concerned about the lack of confidence displayed by preservice teachers regarding the use of technology and is currently investigating the use of Web 2.0 technologies to promote learner engagement.*

REFERENCES

Burns, R. (2002). *The adult learner at work.* (2nd ed.). Crows Nest NSW: Allen & Unwin.

Buzan, T. (1995). *Use your head.* London: BBC Books.

Clarke, D. (2002). *The learners` perspective study:* University of Melbourne.

Fogarty, R. (1997). *Brain compatible classrooms.* Australia: Hawker Brownlow Education.

Gardner, H. (2004). *Changing minds.* Boston: Harvard Business School.

Kornhaber, M., Fieros, E., & Veenema, S. (2004). *Multiple intelligences: Best ideas from research and practice.* New York: Pearson Education Inc.

Lane, J. (2005). *The digital divide: Are our girls falling through the gap?* Australian Educational Computing, 20(2), 11-16.

Lessonlab-Inc. (2000). Timms- r video study manual.

Marsh, C. (2004). *Becoming a teacher: Knowledge, skills and issues.* Sydney: Pearson.

Morgan, H. (1997). *Cognitive styles and classroom learning.* Westport, Conn: Praeger.

Oliver, R. H. J. (2001). *Teaching and learning online.* Perth: Edith Cowan University.

Olivero, F, John, P., & Sutherland, R. (2004). *Seeing is believing: Using videopapers to transform teachers` professional knowledge and practice.* Cambridge Journal of Education, 34(2), 179-191.

Perry, G., & Talley, S. (2001). *Online video case studies and teacher education.* Journal of Computing in Teacher Education, 17(4).

Resnick, l., Levine, J., & Teasley, S. D. (1991). *Perspectives on socially shared cognition.* Washington D.C.: American Psychological Association.

Sheahan, P. (2005). *Generation y: Thriving and surviving with generation y at work.* Prahran, Victoria Australia.: Hardie Grant Books.

Splitter, l. J., & Sharp, A. M. (1995). *Teaching for better thinking: The classroom community of inquiry.* Melbourne: Acer Press.

Steigler, J., & Hiebert, J. (1999). *Understanding and improving classroom mathematics instruction: An overview of the "timss" video study.* Phi Delta Kappan, 79(1).

World-Bank. (2002). *Constructing knowledge societies: New challenges for tertiary education.* Washington D.C.: The World Bank.