

# **Focus on pedagogy:**

## **The use of digital video and iMovie in K-12 schools**

**Matthew Kearney and Sandy Schuck**

*Faculty of Education*  
*University of Technology, Sydney*  
[Matthew.Kearney@uts.edu.au](mailto:Matthew.Kearney@uts.edu.au)

**Abstract** New developments with digital video and editing software have given rise to new ways of using video to enhance teaching and learning. The project discussed in this paper investigates the value and use of student-generated digital video for enhancing pedagogy in K-12 schools. A collaborative project between academics from a NSW university and Apple Computer Australia is currently in progress and aims to identify, examine and analyse pedagogical practices in relation to use of this technology in five case schools. This paper will discuss the literature supporting the project, the research design and the rationale for a study of this nature. The paper will highlight the focus of the investigation, that of investigating pedagogy rather than technology, and discuss the merits of such a focus.

### **Introduction**

Over the past decade, digital video has developed from an expensive, rather clumsy medium involving external laserdisc players, to a cheaper, user-friendly medium with many capabilities that facilitate learner control. This development has given rise to a host of new applications in education, including the ability of students to capture, edit and generate their own video; a process supported and made viable by the development of clear and easy-to-use video-editing software, such as iMovie. Apple Computers have led the field in developing such software for use in education. As a result, student-generated digital video is now being used in classrooms to support, extend, or change, pedagogy and curriculum outcomes. This use of video is usually supported by ideas of student-centred pedagogy and is in contrast to more traditional uses of video which tend to be didactic in approach. The project discussed in this paper examines the ways in which pedagogy is being developed through the use of student-generated digital video. The project makes a unique contribution to educational technology research by focusing on pedagogy and adopting a socio-cultural perspective to examine pedagogical issues and support structures surrounding this particular use of digital video across the curriculum in K-12 Australian classrooms. In this paper the authors consider the research literature on student-generated digital video to date and indicate how the current study differs from earlier studies. The authors consider the possible contributions to the educational technology literature that can be made by studies, such as the current one, which have a focus on pedagogy.

### **Background**

#### **Research on new technologies and good practice**

Mason (2002) suggests that although many articles, case studies and conferences have discussed the value of new technologies for best practice, very little evidence has emerged

from these studies. Ongoing changes in technologies and rapid development of new ones have made it difficult to study any educational technology applications in a substantive way. Mason suggests that we have a need for studies that provide understanding on how to engage students affectively and how to create exciting electronic-based learning in a variety of curriculum areas. This study aims to develop understanding in these areas.

Selwyn (1997) suggests that case studies that analyse what is happening in a technology-using classroom and that investigate the relationships the users develop towards the technology are of more value than studies that predict outcomes of technology use. His suggestion is that research should concentrate on the socio-cultural aspects of computer-based learning, a view held by the researchers in this study.

In general, the literature on computer-based learning makes many claims about good practice resulting from computer technology use, but most of these claims are untested (Schuck, 2002). The current study is an in-depth set of case studies designed to provide understanding of what is happening in a set of classes using student-generated video, and to focus on the pedagogical practices rather than the technological ones.

### **Research on student-generated digital video**

Searches of contemporary research literature revealed that extremely few studies have been conducted in Australia which focus on the learning that has occurred in schools through the use and production of digital video by students. There are a number of studies that look at student-generated digital video in Australian universities (Crean, 2001; Ludewig, 2001) and these studies are of value in informing the current project. These studies consider the learning outcomes of the activities and integrate the discussion on learning with discussion of the process used. However, few studies were found that investigated student-generated digital video in K-12 Australian classrooms. This area is the focus of our study and indicates that there is a gap in research that is fruitful to explore.

The literature from the United States has a number of descriptions of teachers using student-generated digital video in K-12 classrooms for example, in the production by sixth grade students of digital videos for orientation of new students (Anderson, 2002). Although this literature has value in the practical suggestions it makes that support efficient use of student-generated digital video, it does not consider the role of the teacher, the learning outcomes achieved, the perceptions of the students or other aspects of the pedagogy of using digital video in learning. However, a few papers do consider the value of student-generated digital video from a pedagogical viewpoint. One paper argues the case for use of student-generated digital video to develop and share stories in fourth and fifth grade, with benefits of supporting structure and development of confidence in writing (Banaszewski, 2002). Another example deals with the production of video in science classes (Thode, 2001).

A recent report (Reid et al., 2002) considered the British Educational Communications and Technology Agency (BECTA) project on the use of student-generated digital video in fifty UK schools. However, the evaluation of this study was done by the British Film Industry and consequently had a greater emphasis on the quality of the end products than on the pedagogical benefits of using this technology. While the UK study has produced some valuable findings relevant to our study, it has also raised questions of interest in this research, such as those concerning the importance of the quality of the final product for enhanced

learning. Also, our study is considering the value of the technology for contributing to Australian curricula, which has not been a focus of any study to date.

Some of the research on video-based laboratories in secondary and tertiary science and mathematics education does focus on pedagogical issues, but here the video material is often pre-made rather than generated by students. In these computer-based activities, students use digital video presentations to make observations, measurements and gather data about events. When connected to spreadsheets, students can then use the video clips to efficiently gather data and make graphs and other representations to analyse and model this data. Studies have shown these video-based laboratories to be motivating and authentic learning experiences for students (Beichner, 1996; Gross, 1998; Laws and Cooney, 1996; Rodrigues, Pearce and Livett, 2001; Rubin, Bresnahan and Ducas, 1996). Indeed, Squires (1999) described video-based laboratories as promoting open-ended exploration in an authentic learning environment, particularly when the learner chooses and captures his or her own film clips. Rubin et al. (1996) developed one of the pioneering studies in this field, introducing this notion of learner-shot video in mathematical analysis. In their study, students used CamMotion to explore a dance sequence and analyse the motion of their own bodies. However, even in this specific field, most of the literature only touches on the use of learner-shot video and is confined to secondary or tertiary science and mathematics education in the US. Kearney (2002) recently conducted an Australian-based study, investigating a more qualitative use of (pre-made) digital video clips that were used as stimuli for a series of predict-observe-explain science learning tasks. One area of suggested future research emerging from this study was indeed the use of learner-shot video clips in these types of tasks and their possible effect on film credibility, student ownership and task authenticity. These pioneering studies on video based labs have provided a useful guide in the design of sections of this study.

In summary, this study is extending the meagre literature on developments using digital video, with its emphasis on student-generated video in K-12 Australian settings. It builds on practical ideas already discussed in earlier literature.

## **The Study**

### **Rationale**

There are three related foci for this study that make it different from many previous studies in this field. Firstly, it examines pedagogy rather than the technology per se; secondly, it focuses on student-created video rather than pre-made professional video productions; and finally, it focuses on the *process* of generating the video rather than giving undue attention to the quality of the actual product.

#### *Focus on teaching and learning issues*

The value of digital technologies for enhancing pedagogy is under-researched: there are many claims that use of digital technologies does enhance pedagogy but few research studies show evidence of this (Mason, 2002). Many studies tend to be descriptions of how the technology was used rather than thoughtful discussions of its contribution to learning (Windschitl, 1998). A study that has pedagogy as its emphasis has a different focus from a study that looks at a description of an activity using a particular technology. Kozma (1994) suggested that research questions relating to educational technology should move away from the traditional questions seeking to find which medium is better, as these comparative studies do not examine

processes or contextualise findings. Instead, he suggested a need to find appropriate uses of various media capabilities and the ways in which these capabilities may be used to influence learning for particular students, tasks and situations. “An understanding of the way that media capabilities, instructional methods and cognitive processes interact in complex social situations will allow us to take advantage of these capabilities” (Kozma, p. 17). Indeed, Salomon, Perkins and Globerson (1991) emphasised the futility of an educational research agenda focusing on technology itself: “...we are aware that computer technology in and of itself is of little interest. What is of interest and can potentially affect students’ intellect are the kinds of programs and tools that can be used with this technology, as well as the kinds of activities that they afford” (p. 2). With these issues in mind, the authors designed the study discussed in this paper so that it looks at the affordances of student-generated digital video for learning and examines the learning outcomes achieved, as well as the roles of the students and teacher in the learning, and the pedagogical approaches used by the teacher and students.

#### *Focus on student-created video*

The study focuses on the use of student-made digital video as opposed to pre-made video, and therefore fits in well with educational technology literature on authentic, student-centred, technology-mediated learning (Jonassen, Peck and Wilson, 1999). Indeed, this is in contrast to traditional studies in this area that focus on pre-made (usually commercial) video, often designed for didactic instruction.

#### *Focus on process rather than product*

Instead of focusing on the quality or characteristics of the actual video products (for example, see Reid, Burn and Parker, 2002), the study investigates the *process* of creating and using digital video and considers the associated learning outcomes. Although contemporary research contains many claims about the value of educational technology, little of this research critically analyses the *ways* in which such technologies interact with the complex social environment of the classroom (Schuck, 2002).

### **Methodology**

In accord with points made by Kozma and others that understanding effective pedagogical use of technology requires a contextual approach and attention to multi-faceted processes of teachers and learners, the study uses case-studies of schools identified as using student-produced digital video to enhance learning. Research questions investigate the processes and roles of teachers and learners that operate in these schools.

In studies of exemplary practice in schools, the selection of case schools is often based on problematic assumptions about exemplary practice, for example, that results of Basic Skills Tests will identify exemplary practice. The authors feel that being directed to investigate practice which has been identified as exemplary by others, often detracts from the understanding of what is happening in the classroom, by limiting observations. Therefore, in this study, the researchers are not looking at practice identified as exemplary by some external criterion, but are considering examples of pedagogy using student-generated digital video which have not been labelled in any particular way. The researchers bring to this study their understandings of good practice which emphasise inclusivity, engagement, encouragement of student autonomy, collaborative learning and access to subject content. These understandings are supplemented by knowledge of other frameworks of good practice (for example,

Newmann, 1996). The researchers are considering the pedagogies used in the cases in the light of these understandings and also with a view to broadening their understandings in the context of the new technology.

The research questions include:

- How do teachers' beliefs about learning influence their use of student-generated digital video in lesson designs?
- What is the role of the school in promoting innovative use of the technology? What other contextual factors constrain or enhance the use of this technology in teaching and learning?
- What new types of learning outcomes are achieved through the use of student-generated digital video in various Key Learning Areas? What is the nature of the teacher roles, the peer learning structures and the learning tasks that facilitate these outcomes?
- What pedagogical approaches are being used with this new technology and how are notions of good practice informed by these approaches?

### **Research plan**

The study seeks to gain an understanding of the way that teachers and students interact and learn in classrooms in which practice using student-generated digital video occurs. It focuses on what happens when teachers in K-12 classrooms use this technology to develop their students' understanding of curriculum content. A qualitative research paradigm will be used in this interpretive study (Erickson, 1986; Lincoln and Guba, 1985) to develop a deep understanding of these types of practices occurring in five case study classrooms.

As noted above, the selection of case studies schools in which exemplary practice exists is often problematic. Also, the number of schools using student-generated digital video is limited. Therefore, schools have been selected for this study, firstly because Apple has identified them as schools using student-generated video for pedagogical reasons, and secondly because there is a whole-school use of the technology. This second factor will prevent a case from becoming unsuitable because of teacher transfer or individual difficulties with timetabling of observations. Further, schools have been selected so that there are both primary and secondary schools and a range of curriculum areas and pedagogical contexts for the use of the technology.

As both researchers are proponents of socio-cultural theories of learning, the historical-social-cultural context of the students and teachers are of interest and are being probed in observations, interviews and document or material study. Data on the practices of the teachers and students is being collected and analysed from a socio-cultural perspective, in which the interactions of the group, their past experiences and beliefs, and the impact of being researched, are all seen as part of the research data.

### **Method and techniques**

#### *Participants*

Apple Computer Australia is highly involved in professional development (see for example, the Apple Classrooms of Tomorrow, Apple 1995). Therefore, our industry partners have observed schools using student-generated digital video for pedagogical purposes in a variety of curriculum areas. They have provided the team with a list of such schools. Schools that are

using digital video technology to achieve learning outcomes with greater scope than merely learning to use this technology and schools in which strong support from the administration and a whole-school interest in using the technology exists have been favoured for selection. As noted above, schools were further selected so that there are both primary and secondary schools and a range of curriculum areas and pedagogical contexts for the use of the technology.

Within each school, recommendations by the principal and willingness by teachers and students (and their parents) to participate in the study provided a basis for the selection of up to three teachers in each school, together with their classes for in-depth study.

### *Data collection*

Data are being collected in a number of ways.

*Initial open-ended questionnaires for teachers and administrators:* these are being used to collect demographic information and probe participants' views about administrative structures. They will also probe teachers' thinking about their pedagogical approaches and their goals for their students.

*Observation:* The researchers are acting as observers in the classrooms to develop an understanding of what actually occurs. The roles of the teacher, students, parents and school administration are being considered in these observations. A semi-structured observation schedule is being used to enable the observers to have some uniformity in their observations of the teaching and learning and at the same time be flexible enough to allow observation of the unexpected. Of interest are peer learning structures and ways that the students interact within these structures, who initiates activities and directs them, the nature of learning tasks and the ways in which learning outcomes are achieved, and the ambience of the classroom. For example, researchers are observing the interactions in the classroom, noting whether they are teacher-student interactions or student-student interactions. The types of interaction, such as question by teacher or by student and the purpose of the interaction are also being noted.

Also of interest are whether observed practices match the theories of learning articulated by the teachers. Video clips of the classrooms will be used to support the written data in the analysis, interpretation and reporting of the cases.

*Interviews:* Teachers and administrators are being interviewed. Questions probe rationales for using this technology and for clarification of how the technology fits with the teacher's beliefs about teaching and learning. A semi-structured interview schedule has been developed. Selected students are also being interviewed. The students have been selected for these interviews by means of purposeful sampling (Bogdan and Biklen, 1998) based on researcher observations and teacher recommendations. Students are interviewed in focus groups and the questions probe their learning as well as the affective components of the activity.

*Document and Resource Collection:* The curriculum documents pertaining to the lessons are being examined and the desired learning outcomes noted. Resources such as CDs of the movie product have also been collected. The activities and resources are being discussed with students and teachers to ascertain whether they feel learning outcomes have been achieved and are also being evaluated by the researchers to this end.



## *Analysis*

The study is ongoing with data from four of the five schools collected, at time of printing. Each case is being examined for what it says about practice, pedagogy and beliefs about pedagogy and educational technology. The story of each case will be constructed and developed from the multiple sources of data on that case. The case stories will then be examined so that principles of good practice using student-generated digital video, which match the researchers' criteria for such practice (stated earlier), can be constructed from the stories. Both researchers will develop the case stories from the data, and engage in critical collaborative reflection (Bullough and Gitlin, 1991). This reflection will enable the researchers to interpret the stories in the context of the case school, the researched and the researcher and to modify their criteria for good practice to fit the case context.

## **Summary**

This paper presents a rationale for investigating the value and use of student-generated digital video for enhancing pedagogy in K-12 schools. The study makes a unique contribution to educational technology research with its emphasis on pedagogical issues relating to the process of learners capturing, editing and generating their own digital video. Hence, the emphasis is very much on the 'student-generation' of these artifacts and associated learning outcomes and support structures, rather than the actual digital video products per se. The study seeks to take up Mason's (2002) challenge to build an understanding of how students engage affectively during technology-mediated tasks (in this case, digital video generation) and how teachers can create exciting electronic-based learning in a variety of curriculum areas. Unlike many other studies in this field, this interpretive study adopts a socio-cultural perspective and uses qualitative data sources to explore the student-centred use of this technology in learning environments. The authors argue that there is a need for research studies of student-generated digital video to focus on the pedagogy and learning outcomes associated with this technology rather than focusing only on the technology or the products generated. To this end, a research methodology has been developed which considers learning and engagement in the complex environment of the classroom; and the teacher's role, students' roles, affective issues and learning outcomes are all foci of this study.

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