

Podcasting in Library Research: A discussion of three projects developed using new audio technologies

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The integration of Information and Communication Technologies into the school curriculum is a growing trend around the world and certainly mandated by the education authorities in the Australian state of New South Wales. One of the difficulties often faced by teachers is that the use of technology can often distract students from the relevant curriculum outcomes. This paper discusses the use of student created Podcasts with Stage 3 students (10-12 year olds) to enhance learning outcomes. It briefly examines the educational theory that suggests why podcasting could be of educational value and then traces the development of three different units of work that were undertaken at my school by a team of teachers and support staff. The process that we went through and the outcomes that were observed by the students and their teachers will also be discussed.

What is Podcasting?

Podcasting, one of the so called Web 2.0 technologies, is a process used to publish audio in the form of MP3s to the Internet in a data structure called a RSS 2.0 envelope. This envelope, more commonly called a feed, allows potential listeners to subscribe to the feed using freely available software such as i-Tunes or i-Podder. Any new podcasts which are subsequently published to the Internet are then automatically downloaded to the listener's computer and organised ready for when they choose to listen. This means that listeners do not need to regularly check a web-page for an update – the audio is there waiting for them. They are also not restricted to listening to the audio on the computer – there is a wide range of portable MP3 players available which allow the user to download the audio tracks from the computer so that they can listen to the tracks anywhere they choose

While there has been a relatively long tradition of being able to attach audio files to web-pages for download, the RSS feed which technically make an audio file into a podcast is relatively new. The very first RSS feed was developed in 1999, and by late 2002 the New York Times was one of the first news services to introduce an RSS feed. (Wikipedia, 2007). David Winer, one of the pioneers in the use of Web 2 technologies, was the first to demonstrate the ability to podcast by enclosing a Grateful Dead song in a RSS feed on his blog site in January 2001 and by 2003 had further developed the technology. (Wikipedia, 2007) The term “podcast”, itself dates from late 2004, with Dan Searls reporting that a Google search of the term produced 24 hits (Campbell, 2005). This compares with a Google search in March 2007, returning over 130,000,000 hits.

There are basically three main steps in creating a podcast – plan and record the sound, edit and save the podcast and finally publishing and test the podcast. (Broida, 2005). The first two steps are easily accomplished by students and it is only the final step of publishing that requires more technical expertise. There are free Internet sites such as Blogger that will host podcasts and step you through the process of publishing them (Podcasting News, 2006) or alternatively there is a range of software that can be downloaded and schools may opt to host the podcasts on their own site.

Why Podcast?

The main purpose of this paper is to explore the use of podcasting in the setting of school education. As discussed above, podcasts provide a flexible and easy way for students to publish their work on the Internet. In Australia over 5.8 million (>70%) of households are connected to the Internet, 77% of these having broadband access (ABS, 2007) with households that have school aged children being much more likely to have the Internet (ABS, 2004). These means that the majority of children and their parents can access the podcasts that were developed and published at school from home. However, just because a technology is readily available and appealing to students does not necessarily make it suitable to use for educational purposes. Before looking at our actual project, current educational theories and research will be briefly discussed to shed light on the reasons that the use of podcasting could be of value to educators and their students.

Much of current educational theory draws heavily on the work of Vygotsky's theories (1978) and stresses the importance of social interaction in the student's construction of knowledge. Vygotsky's work on language (1967) stresses the interrelation of thought and language and places high importance on writing as "the most elaborate form of speech ... [with] the evolution from draft to the final copy reflecting our mental process. (1967, p 143) His later educational theories, describe the 'zone of proximal development' where a child that has only partially mastered a task can still "participate in its execution with the assistance and supervision of an adult or more capable peer" (Rogoff and Wertsch, 1984, p1)

More recent theories of cognitive apprenticeship (Collins, Brown and Newman, 1981) and legitimate peripheral participation (Lave and Wenger, 1991) draw on Vygotsky's theory and describe learning as a community activity where learners have access to a culture of expertise as well as being able to "participate in information flows and conversation in a context in which they can make sense of what they observe and learn" (Lave and Wenger, p 103). In the Social Inquiry Teaching model, Gillani (1994) stresses the importance of students and their teacher as a group interacting, collaborating and communicating over an "intellectual puzzlement". (Gillani, 1994 p 84)

Other researchers emphasise the value of the publication of student work. Publishing allows work to be available for revisiting by the student to allow reflection and analysis of the process involved in the creation of the work, (Krajcik et al, 1994 and Olson, 1994 both cited in Ferdig and Tramell, 2004), and to allow for feedback from teachers and peers allowing for better scaffolding with the task (Ferdig and Tramell, 2004, Bandura, 1986).

Lave and Wenger (1991) also describe the importance of the "invisibility of the mediating technologies" (p 103) so that the focus remains on the subject matter, not on the technology itself. If the cognitive overhead of using a particular technology is too high, studies have shown that less cognitive processing power is spent to the content. (Abbey,

2000). The ease of recording and editing sound certainly allows for this “invisibility” and in embarking on this project this was an important consideration. Students and teachers do not need to learn a complicated set of skills in order to record sound, the editing of the sounds was generally limited to simple cut and paste and linking files to a webpage is a skill that is easily learnt.

Much research has been done in the area of the use of multimedia increasing the cognitive skills of a student. This work has centred on the idea that students learn more when the information is presented using multimedia than simply with the use of one media such as text. Paivio’s (1986; cited in Mayer 2001) dual-code theory of learning assumes that there are separate information processing channels for verbal and pictorial information, that by presenting information that use both these channels the likelihood of learning is increased. Mayer (2001) has conducted many experiments to try and ascertain exactly what combination of media and in what context learning increases. He identifies two different learning outcomes that of increased recall and applied understanding. Multimedia contains much deeper sources of information than using a single media such as print.

Chen and Fu (2003) concluded that presenting information using multimodal methods results in students maintaining attention for longer periods of time and that they were more confident in their abilities than with a paper based task. This confidence can be self-fulfilling – students expect that they will be able to create a successful product, therefore they will master the skills in order to do so.

Because of the newness of the technology, the amount of literature specifically related to the educational benefits of student-created podcasts was rather limited. There are a growing number of writers and researchers discussing the benefits to students listening to published podcasts such as Lamb and Johnson (2007) who discuss a variety of uses for school students such as listening to the experiences of experts in content area fields, critical reviews of books, theatre and movies, and language lessons. Jobbings (2005) and Lucking, Purcell and Christmann(2006) discuss teachers using podcasts to provide additional support, individualised and enrichment content for students as well as the ability to archive guest presenters and student performances. Campbell (2005) describes the “magic in the human voice ... of shared awareness” (p 40) and looks at uses in the sphere of university seminars, where rather than just setting readings for students as preparation he could prepare a commentary. In a similar vein Murrell(2006) quotes Professor Carmichael who is an enthusiastic user of podcasting at Deakin University because it can “ help to lift the meaning off the page, convey my enthusiasm for the subject and try to give a sense of context, logic and meaning to the major concepts and issues in the unit”

Meng (2005) in his white paper for the University of Missouri discusses a range of potential uses that involve student creating their own recordings including foreign language students uploading lessons for their instructor and project support interviews. Lim (2006) develops this idea further and describes how he used podcasting in a pre-service course for postgraduate geography teacher trainees. The trainees were asked to consider using podcasting in their own teaching and the general responses were enthusiastic. Most responses again involved the teachers authoring podcasts but a few looked beyond this to student authored uses including recording students presentations and recording student interviews with the public on field trips.

Background to Task

My role within my school has been to integrate technology within the curriculum and in the upper primary school (ages 8 – 12) I have worked very closely over a number of years with the teacher librarian. We have team taught with classroom teachers integrating library research skills and IT skills in the curriculum area of HSIE (Human Society and Its Environments). In 2007 we were asked to expand our role to also work in the Science curriculum areas.

Issues

While there has been recognition of the importance of integrating skills and a willingness of classroom teachers to be involved, we have struggled with a number of constraints in the development of successfully integrated programmes. Time is always a major factor. I am fortunate to be teaching in a school that recognises the importance of support for staff and have been allocated time to assist staff in developing units of work as well as being able to help develop resources for use within the classroom. However, what originally starts out as a well constructed unit of work with a nicely balanced emphasis on both the information and IT skills often becomes hastily condensed when lessons are missed because of excursions, sports days and sickness. With pressure to complete units of work, the temptation is to skip over the information processes and concentrate on the final product. The students are only too keen to focus on the presentation of the research, whether this is a written report, a visual presentation or a multimedia piece and often fail to see that the process is just as important.

Complicating this, is the access to the resources needed, whether this be books, Internet, computer lab or support personnel. Unfortunately with many units of work being planned to take a term, different classes are then under pressure to complete project work at the same time. Despite the fact that my school is well resourced, at busy times access needs to be negotiated and this is always a further frustration.

Another issue we faced was that with tasks that involved presentation to the class, it was often very difficult to find the time for all students to be present. Students who were less confident, or who were non-native speakers of English often found such tasks very difficult – not because of the inherent difficulty but because of performance anxiety issues or nervousness. Students would often become restless and not listen as attentively, particularly when a large number of students were presenting their work.

Alternate Tasks

In looking at ways to overcome some of these issues, we investigated developing units of works and tasks where the process would take priority and where the finished product, while not unimportant, would be relatively easy to create and not be the focus of the student's attention. If the process took precedence, needing to alter the timeframe would be less of an issue. It would also lessen the temptation for those students who like to concentrate on the visual and/or performance aspects of a report to rush over the earlier stages of the information processes.

Apparent advantages of Podcasting

To us, the use of recording a student's oral response to a research question seemed a natural solution to many of these issues. Students would need to concentrate on the processes of collecting, organising and analysing information. There would be the need to write a draft and polish a report, prior to recording the finished presentation. Because students would record these individually, issues such as nervousness would be diminished and because the actual recording was relatively quick, it could be accomplished in spare moments of time during the day. By using a digital recording the finished product could be published on the school's Intranet and students and their parents would be able to share in the whole classes work. Initial work could be placed upon the Intranet without the complexities of creating the RSS feed, as parents could be directed to the site by their children and the parents could simply download those tracks they wished to listen to. In fact, for individual tasks, this might be more appropriate as we considered it unlikely that even the most supportive parent would wish to listen to a whole classes' recording.

Equipment Needed

Hardware

We had initially planned to record directly into the desktop computers in our computer lab. However, we were presented with a number of problems here. The sound cards in the desktops proved to be faulty in many of the machines and we could either not record the sound or where we could it was of a very poor quality. Even if the sound could have been recorded successfully, we soon realised that this was not a very satisfactory solution. The lab was often booked by other classes when the HSIE lessons were scheduled and if we did have access to the lab, having numerous students recording different talks simultaneously was difficult as they became distracted and the microphones tended to also capture neighbouring students' voices.

In our first audio recording task which we undertook in 2006 we gained access to a hand held digital recording device from our senior school and used this along with a couple of teachers' laptops to capture the sound. The digital recording device proved particularly successful and in 2007 we purchased a number of these for the junior school. They are relatively inexpensive, robust if dropped on carpet and very easy to use. Students could be positioned in various small rooms, on verandas etc so they could capture the sounds without picking up each others voices and we did not have to worry about the availability of the computer lab.

Software

We decided to use Audacity to edit the sound. This is a freeware program, which meant that we did not have the overhead of purchasing software for the computer lab and students who were particularly interested in the process could also download the software for use at home. It is also a program which is very easy to use and we found that most of our students were very confident in using the software after only one short demonstration by a teacher.

Support

The support for classroom teachers was of three different types. Most importantly was the support provided by the librarian firstly in sourcing relevant resources and then in assisting the classroom teacher and students in researching the question. IT support was provided in installing software, training of teachers and students in using the recorders to capture the sound, assistance in recording the speeches and with using the software to edit the recording into a finished product. Finally we were fortunate in being able to employ a university student to help with downloading the files from the recorders and then uploading the finished products onto the school's Intranet. While some students could and did download the sounds onto the school's network themselves, we found that with time constraints it was generally quicker to do this on-masse.

We were fortunate in obtaining a grant through an educational scheme funded by the Australian government to promote the integration of technologies and so could provide for a number of teacher release days for training and the planning of the units of work. We set up two teams - the year 6 team, which consisted of the Year 6 classroom teachers, the teacher-librarian and ICT support, and the year 5 team which consisted of the Year 5 classroom teachers and again the librarian and ICT support. Each team initially met for a day's planning session, where the unit of work was planned, the final task developed and some hands-on experience using the technology. During the unit, which was planned for a 10 week term, each team met regularly to discuss progress, report on issues and refine teaching strategies.

Description of the Tasks

Year 5 Task

The year 5 students (10-11 year olds) were working on a Science unit about extreme weather conditions. Outcomes of this syllabus that needed to be addressed included "Some weather phenomena are violent and destructive" and "Human communities are affected by extreme weather".

Teachers worked with students to develop an understanding of weather and why extreme weather events occurred. Students were asked to research a particular event, for example a cyclone, and then to produce a 1 - 2 minute radio broadcast with themselves acting as a journalist. They were to act as though they were reporting either during the weather event or its aftermath. In order to assist them, they were given a structure that needed to include the location, time and date of the disaster, its effects on people and the surroundings and how the community managed the disaster. While they could use real events as a basis, the report was to be of a fictitious event.

The task meant that students need to develop a good understanding of their weather event. Because they were not reporting on an actual event, such as Cyclone Tracey or the Asian Tsunami they could not simply quote existing sources, rather they needed to assimilate information and then use this creatively to devise their report on a fictitious event. Facts needed to be checked and the student's draft report rewritten in order to polish the language.

The final step was the recording of the report. In most cases students did this on the first take, although there was the opportunity to re-record either part or the whole task if the student needed to. After the task was uploaded to the network, students were involved in linking their task to a web page so that the recording could be accessed remotely.

Year 6 Task

Our year 6 students (11-12 year olds) had undertaken the recording of an oral task in 2006 and so were familiar with the technical process. Rather than just preparing a talk which would be recorded the task that was developed would see the students working in pairs. Each student in the pair would take on the role of an expert in a particular field. They would be interviewed by their partner, and then would swap roles, where this time they would act as the interviewer for their expert partner.

The Year 6 students' curriculum area was that of HSIE with the focus area of Rainforests with the students undertaking the activities of "investigating a rainforest environment in Australia"; "investigating the effects of human and natural changes on a rainforest environment" and "researching the different perspectives held about the maintenance and improvement of rainforest environments". After about 4 weeks of class activities which involved the students developing a broad understanding of rainforests and issues surrounding them, students were allocated a particular area to investigate, with teachers differentiating the task based on ability. Less able students were paired together and they were encouraged to select as their area of expertise a particular flora or fauna or the local inhabitants. More able students were encouraged to delve into more complex topics such as damage to the rainforest because of climate change, deforestation due to human activity, the impact of eco-tourism etc.

Once the student expert had researched their chosen topic, she developed a dot point summary of her findings which they passed to their interviewer partner. The student interviewer used this to develop a set of 4-8 questions which she would ask in the interview. The student expert was allowed time to prepare a response to the questions, but the aim was to conduct the interview as a conversation rather than as a highly polished speech. The object was to have students express in their own words their findings and understanding of issues regarding the rainforest environment and hopefully avoid the temptation to copy large slabs of text from either books or the Internet

Podcasting Group

With the interest shown by the Year 5 and 6 students in the use of recording, the junior school music teacher and myself decided to start an extra-curricular "podcasting group". The idea was to produce a monthly radio show about happenings in the school, which would be of interest to students and their parents. This would be placed on the Intranet and a RSS feed established.

Students were asked to apply and a nucleus of eight students was selected. We had initially planned to have particular students working on the journalistic side and others on the technical side but the students seemed keen to be involved in all aspects of the production so it was decided to have the students work in pairs to plan stories, conduct interviews and finally edit their piece(s). A year 6 student was paired with a year 5 student, with the hope that in the following year, when new students came into the team we would have a number of experts that could train up the new year 5 students.

As we could generally only meet once a week, it did take longer than anticipated to get the first show to "air". Students needed to become familiar with both the technical aspects as well as the process of writing suitable questions and successful interviewing techniques.

However when the 15 minute show was launched in late March, there was much excitement and the students were keen to commence on the next immediately. They currently plan to publish two shows a term, although as they become more independent this may increase.

Findings

In both the Year 5 and 6 assessment tasks, as well as for the podcasting group, students were very motivated by the fact that their work would be published for others to listen to. While the podcasts were only to be published on the school Intranet for access by the school community, students were very motivated by the fact that their parents could access their work. One of the students said that this was “like being a real reporter”. We also had a number of students in the group who were boarders and they were particularly excited about the fact that their parents would be able to access their work – in one case from overseas. One of the teachers commented “The students and parents loved having access to the files on the Intranet. I don’t think the girls would have been nearly as motivated to go home and show their parent their work if it was just a visual document. There were lots of positive comments about last year’s project from parents who had accessed it from outside the school.” Interestingly the students were also very keen to listen to each others’ responses. Of course this could be the novelty of this type of presentation and it will be worth noting whether the motivational factor continues in subsequent years.

The students were keen to make sure that their facts were accurate and that the writing “made sense”. Unlike a written task where there is a tendency for students to write a response and not revisit it, the students in all three groups were keen to listen to their response and engaged in evaluating their own work without prompting from teachers. Particularly with the podcasting group and the Year 6 task, the students would recognise that the flow of conversation did not always make sense or could have been worded better and would rewrite and rerecord segments. This is very much what Krajcik et al, (1994) and Olson (1994) found in their studies on students publishing work and was very exciting for the teaching staff to observe. Another outcome which again was predicted by the professional literature on the social construction of knowledge, was how the depth of understanding was enhanced by the conversations the Year 6s engaged in while preparing for the interview. Students needed to clarify their own understanding before being able to respond to questions and often needed to return to their resources in order to accomplish this. This conversation with their partner and often the teacher helped students make sense of the information presented to them. Teachers were quite struck to the extent that the students “expressed the information they had gathered in their own words” showing an assimilation of their learning.

At the time of writing this paper, students had not been formally assessed other than through the recording and interviews so it cannot be ascertained whether using the mixed mode of both text and sound will help students develop a deeper knowledge as predicted by Mayer,(2001). However, as teachers, we are well aware that students do have preferred learning styles and mediums and feel that developing a range of tasks that encompass as many as possible is important. We can certainly attest to the findings of Chen and Fu (2003) in the motivational aspect of using a recording rather than a paper based report. Students remained focused and were all confident in their use of the technology. Students found it “fun”, enjoyed the fact that they “could be creative with my presentation” and “it was different”. Interestingly a number of students commented on finding the process of the writing of the content and working with their partner also more interesting despite the fact that they had often did this in other tasks.

The fact that they all learnt a new skill helped boost their confidence and slower students were equally capable of producing a quality sound. When asked what they liked about the recording their findings, a surprising number of students independently commented on feeling more comfortable in not having to stand up in front of the class to present their report. “I like it when it is just our voice recorded instead of our body movements as well”, “...it wasn’t exactly showing your face”, “...the listener can’t see you and when you blush they won’t know” are comments from three students which indicate the nervousness they must generally feel when faced with the prospect of presenting to a class group. Obviously speaking in front of their peer group is a skill that students do need to develop and the students themselves recognise this, with comments such as “I have grown some confidence when I speak”, “not to be so nervous” (about speaking), and “to be braver about talking”. As yet, we have not had a follow up task where students have presented orally to their peers and we are keen to see where the use of recording has in fact developed confidence in the students.

The staff did find that the technology was easy to use and that because of its unobtrusive nature, students could spend more time on the actual intellectual exercise of the task not in learning or manipulating the technology. At the completion of the task the students were asked to evaluate what new skills they have developed. Very few students actually commented on the technical skills – their focus was very much on the research and oral presentation skills. Comments included “better public speaking”, “be more confident in speaking” and “better at researching” This is in contrast to other technologies where some students are disadvantaged by slow typing speeds or find manipulating complex layouts challenging. None of the students were at all concerned about difficulties in using the technology and in fact one teacher reported “I think that audio technology allows some students who don’t normally fit into the high achiever category to shine. Mary Smith (fictitious name) for example – I have never seen her overly enthusiastic about presenting information before. Last Friday, she enthusiastically volunteered to be one of the first to record and was obviously very proud of what she had to say.”

As part of the Year 6 unit of work, students looked at the role of questions in an interview. Their teachers discussed different types of questions and the role of these” “What” “Where”, “When” to extract factual information and then the more probing questions of “Why” and “How” in order to develop meaning and a deeper understanding of an issue. This was reflected by a comment from the teacher-librarian. “The process of constructing questions is a good learning activity requiring solid analysis of someone else’s information” A number of students reflected that they had “learnt how to ask good questions”.

An unexpected teaching opportunity that arose was the opportunity to look at how meaning can be changed by the editing process. One of the segments in the first radio show produced by the podcasting group was about the use of a teaching programme called “LetterLand” to help Kindergarten students (ages 4-6) to learn the names, shapes and sounds of the alphabet. The segment consisted of interviews with the teacher and students and recordings of the students singing. The young Kindergarten students took a bit of prompting and their responses were often quite convoluted and contained mistakes. During the editing process the podcasting group discussed just how much editing of the interview should occur. The students were faced with the dilemma of wanting a smooth sound and yet not wanting to alter the sense of what the kindergarten students had actually said. One student in particular was very keen not to “change what the kindies (the Kindergarten students) said” She felt in doing this they would “not sound like them”. By engaging in the editing process the students witnessed first hand the ability of the media to alter and even misrepresent what has occurred

in an interview. This is certainly an area that could be explored with a class group at a later stage in further units of work.

At the time of writing this paper at the end of the school's first term, the students had nearly all finished recoding their tasks and we had begun the process of organising their work to upload to the school Intranet. It was planned that after they returned from the Easter break, the Year 5 students would link their weather reports to a webpage they were developing and the Year 6 students were keen to further edit their interviews and possibly add appropriate sounds to them. The podcasting group had commenced work on their 2nd "show". Teachers had yet to formally assess the student's work or to fully evaluate the unit but the general consensus was that the units of work had been generally successful and were worthwhile. A number of follow-up activities had been suggested during the unit including more work on the students' ability to develop appropriate questions which is after all an important element of defining a topic prior to researching it.

Certainly, as a staff, we are keen to further explore the use of podcasting where appropriate in the school's curriculum. It is a new technology that certainly excites and motivates students. Unlike many other computing technologies it is very portable, relatively inexpensive and is easy to use and as a result is easy to integrate in a meaningful way in to a variety of either teacher-directed or student – centred activities. As more schools experiment in the use of this technology a greater range of new applications will be identified as will ways of incorporating this technology within existing units of work and projects. Hopefully further research will help identify ways that the technology can be exploited to maximise the student's learning experiences.

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