

The educational value of student-generated podcasts

Abstract

Podcasting is becoming a well established technology in Higher Education (HE). However, most applications tend to use staff-developed content to provide material to supplement lectures. The use of learner-generated podcasts and its impact on the learning of both student producers and listeners are under researched. This paper reports on a pilot study of student-created podcasts. The podcasts were developed by a group of medical students at the University of Leicester who chose to study a genetic module in their second year. The content of the podcasts was entirely generated by students. Their topics covered a range of ethical issues surrounding genetics. Five student-developed podcasts were made available in early 2007 for other medical students to access through the Medical School Virtual Learning Environment (VLE). The study focused on the impact of these student-developed podcasts on student producers' learning. It demonstrated how podcasting can empower learners and help them become more active and independent learners, and how student-developed podcasts can promote engagement and motivation for learning, improve cognitive learning and develop transferable team-working skills among student producers. The paper offers an example of student-generated podcasts from practice and insights on how this practice might be expanded and transferred to other learning contexts with HE sectors.

The educational value of student-generated podcasts

There is a growing interest in using podcasting as a tool for supporting and enhancing student learning in HE, but most studies deal with podcasting using staff-produced material, with the student being a passive learner. McLoughlin, Lee and Chan (2006, p.4) noted, "There have been very few published examples of podcasting being used within the higher education sector to empower students and encourage active learning, and even fewer based around learner-generated podcasts."

This paper reports on a pilot study where the students were active producers of content as well as consumers. First, it reviews findings from studies on student-generated podcasts in HE. These findings relate to providing cognitive and affective benefits to students, promoting their reflection on the learning, fostering collaborative learning and improving their engagement and motivation.

Providing cognitive and affective benefits

In a pilot study that forms part of a large Australian research project of the broad educational benefits of student-generated podcasts, Chan and Lee (2005) examined how student-produced short podcasts could be used to address preconceptions and anxiety that students bring into the university classroom. Their study showed how these podcasts can provide both affective and cognitive benefits to student listeners. At first the study was based on a pilot group of undergraduate on-campus students studying Information Technology, but it soon expanded to include a wide range of undergraduate and postgraduate subjects and involve both on-campus and distance learning students. In a later study, the same approach was found effective in providing the cognitive as well as affective benefits to distance learners (Lee and Chan, 2007). Student-generated podcasts were found successful in enhancing understanding of the subject and promoting a sense of belonging to a learning community among distance learners. In another two studies, the same approach was found beneficial to the cognitive learning of student producers, by helping them to reflect and improving their metacognition

(McLoughlin, Lee and Chan, 2006), and by promoting collaborative knowledge building (Lee, McLoughlin and Chan, 2007).

In America, Miller (2007) podcasted weekly students' meetings where they discussed psychology lectures. Students could submit their questions via email before the discussion, when these questions were answered. Students recognised cognitive benefits for them in making and listening to podcasts they made. They reported that 'the interactive, unrehearsed conversation format' and the opportunity to repeat lecture material were effective in enhancing their understanding of the material.

Promoting reflection

Learner-developed podcasts enable students to reflect on their learning through listening and improving on their own oral performance (Huann and Thong, 2006), as well as re-considering and modifying their ideas (Hargis and Wilson, 2005) during content creation.

Lee (2006) investigated the potential of podcasting for delivering Australian students' oral presentations and of blogging for facilitating peer and self-evaluation for assessment purposes. Students were asked to record their presentations in MP3 format for podcasting, then use a collaborative blog to critically reflect on their work and on feedback from classmates. This approach enabled "two-way dialogue between the listeners and producers" (McLoughlin, Lee and Chan, 2007). Ng'ambi (forthcoming) introduced podcasting for mediating reflective practice into a South African on-campus postgraduate course in Information Technology. Students were asked to make presentations in a group. Their oral presentations, questions being asked by peers, and their responses to the questions were recorded and made available as podcasts. Students were then asked to listen to the podcasts and individually reflect on questions asked by peers, and they wrote reflective essays for assessment purposes. This study showed how podcasting can enable reflection to take place by giving students the opportunity to come back to their original presentations, allowing them time and space to think over questions asked by peers. It also showed how students can learn from peers by taking their insightful questions and by learning how peers answered questions.

Fostering collaborative learning

Student-generated podcasts offer the potential for promoting collaborative learning through voice interaction (Huann and Thong, 2006).

Lee, McLoughlin and Chan (2007) showed the collaborative learning opportunities offered by student-generated podcasts through sharing understanding, perspective-taking and negotiation of meaning among student producers. Edirisingha, et al (2007) described another study in which fellow students, senior students and tutors were involved in content creation. Feedback from student listeners showed how student-contributed podcasts can foster a collaborative learning opportunity, by enabling listeners to take in information from different perspectives and opinions offered by producers.

Improving learner engagement and motivation

Student-created podcasts were a method to engage learners and promote their learning motivation for a range of disciplines.

Student-developed video podcasts based on field trips, replacing conventional text-based field reports were used as a means for assessment in Geography to engage students with the field activity and enable them to produce field reports creatively (Downward et al., 2007).

Student-created digital stories were found effective in engaging students with reflective practice for medical students (Murray and Sandars, 2007), and first year students studying a wide range of subjects in Social and Natural Sciences (Jenkins and Lonsdale, forthcoming).

Student-produced podcasts were found to be successful in promoting engagement and enhancing motivation for both the student listeners (McLoughlin, Lee and Chan, 2007) and producers (McLoughlin, Lee and Chan, 2006) studying Information Technology.

A group of students studying Psychology at the University of Connecticut also recognised motivational benefits of participating in creating and listening to the podcasts from discussions of questions asked by fellow students. Comments from students indicated that they appreciated listening to discussion in a way which they saw as 'a lot of fun' (Miller, 2007).

The pilot study

Context

Modern medical genetics presents many challenges, both scientific and ethical. The podcasting activity for the pilot study was developed for use with a group of second year medical students who had elected to take an optional semester-long special study module focusing on developments in genetics and their ethical implications. The students have a wide choice of these special study modules and about 30 students per year take the genetics module.

Rationale

In the past the module has used a mixture of lecture and seminar-style sessions, and it is assessed by essays and group poster presentations. Whilst these activities do develop the students' understanding of issues of modern genetics, the module team wanted more variety in the types of activities used. Additionally, since many students choose special-study modules on other topics, it was felt that it would be useful to get the 'genetics students' to engage in some sort of outreach activity to raise the awareness among their peers of genetics issues. The activity would give students who had not chosen the module the opportunity to consider some of the issues of modern medical genetics by later listening to the podcasted material. Finally, since the podcasts are available to first-year students who will be choosing modules for their second year, they are now a useful archived window on the content and approaches used in the module.

Development process

About 30 medical students were divided into 5 groups. Each group was responsible for researching their own topic relevant to ethical issues surrounding genetics, and for developing their own podcast.

The podcasting activity sessions took place over three consecutive weeks. During the first session a short introduction to the technologies involved was given, since many of the students had not encountered podcasting before. The use of Audacity (audacity.sourceforge.net/) as a free audio editor and recorder was also introduced. Different formats were covered and these included round table discussions, debate, or interview providing for each member of the group to make an equal contribution. The students decided on the topic and format for their podcast themselves, and then spent the rest of the session researching and discussing their topics. The next week was spent with further research and starting to record material. The third session involved more recording and editing.

The topics students chose were: designer babies, genetic screening/testing, diabetes, DNA fingerprinting, and haemophilia. Each podcast was 5 to 10 minutes in length. When completed, the podcasts were made available on the University of Leicester Medical School VLE for other students to use.

Evaluation method

The impact of podcasting on student-producers' learning was captured through two focus groups with thirteen students during the middle of semester. Student interviews, lasted about 40 minutes were conducted using a semi-structured interview schedule developed to explore how they created the podcast in a group and what the perceived benefits were to their learning. The aspects covered in the questions included: how they chose the topic, format, and style for their podcast; how they conducted research; what kind of team-working approach they employed; and what the perceived benefits were to their learning.

Staff experience of using this student-generated approach was gathered through a personal interview with the module leader. Information gathered included background information about the module and students, pedagogical rationale for using this approach, the development process and issues encountered.

All interviews with both students and staff were recorded on a digital recorder and transcribed verbatim for analysis to identify key themes and issues.

Statistics were also collected from the VLE through which the podcasts were distributed, see Table 1. Students who downloaded the podcasts were then invited to complete a short online anonymous questionnaire. Thirty-six students responded, see Table 2.

Findings

Students' feedback on using podcasts for their learning was very positive. Some perceived student-created podcasts as a new way for disseminating and gaining knowledge. One said:

"I think it's a simple way of getting information in a portable format as well, so you can have it on the move. And ten minutes worth of rather than an hour lecture. I mean this is simply put in student language, so how does a student look at the topic and a person who doesn't do this course they can get the information in a simple and quick way and a portable way."

Another commented that podcasts can disseminate genetic-related information to other medical students not taking the module.

"The purpose I think was to relay information of what this module's all about to students who aren't on the module itself so they can find out what we do in the module, and the ethical side...issues that we were talking about, if they find that interesting in genetics and they want to take the module up next year in their own special subject modules then they can. It's kind of like an insight into the module and into what we do."

A number of themes with regard to how student-generated podcasts can contribute to student producers' learning emerged and are discussed below. A diagram based on the discussion is shown in Figure 1.

Cognitive benefits

Students perceived a cognitive benefit offered by creating their own podcast, particularly in relation to enhancing their understanding of the chosen topic through a number of ways: broadening their knowledge by carrying out more research, relating new information to

previously learned information, and being able to view the problem from different perspectives.

One group commented on how the podcasting task pushed them to carry out more independent research on their chosen topic, therefore broadening their knowledge.

“I guess so we research onto a certain topic and broaden our knowledge on it.”

Another group described how they sought recent research findings from the internet to back up their points.

“We just [went] on the internet, like BBC news, and tried to find some major articles from recent times so that we could have something to discuss.... We used our own opinions and had research to back up our points.”

One group indicated how developing the podcast made them to link knowledge they have already learned and reflect on its implications for future development.

“We used our own knowledge from the lectures and what we had learned. Things we had been exposed to before... Basically what we did was we had a brainstorm and looked at the ways, for example that they reduce the smoking rate by, for example, increasing the age. We then thought of what might happen in the future say, if they discovered a certain gene that makes you have protection against smoking... they might let people with that gene smoke... it's more designed to make you think than give information.”

One group described how making the podcast in a debate helped them to think about the topic from an opposite viewpoint.

“Yeah, because two of us were just given cons and two of us were just given pros we had to argue that point even if we didn't believe in it. We had to do the extra research to find out why it might be a con and then talk about it and even if we didn't believe it we got to see that side of the story.”

Another group commented how developing podcasts in a group allowed them to share opinions with group members and learn the topic from different perspectives.

“It is all a matter of opinion, and different people will have different opinions about it. So when it comes to making a conclusion, it was just the fact that there are pros and there are cons to the process. And although we may have had a static view before, after doing this podcast our views may not have changed, but it's enlightened us into other views which were there which we hadn't thought about.”

Promote independent learning

Feedback from groups implied that students could become more independent and active learners if they were given responsibility for the quality of the content they produced.

One group described how they were pushed to research and learn more about the chosen topic by themselves because they knew their discussion would be podcasted and other students would hear it.

“Just because we picked up a more specific topic and it made us think more about that. Also, because we had to talk about it, whereas with a poster you just find information and then copy and paste it all or put it in your own words. Because we had to talk about it, we were forced to research it. We were forced to read it... It helped us to understand it.”

Another group commented on how the task made them to think about how to present the information to appeal to a non-specialist audience.

“Yeah we don’t really know how to make something interesting how to make it appealing to the audience, so it was nice to have the time to do that.”

Groups tried different approaches to make their podcasts attractive. One group added music and fun elements to their podcast because they believed that this informal style would appeal to their audience.

“We wanted to make it fun we didn’t want to make a serious laborious, monotonous recording. So we added in some jingles, we just wanted to make it fun because the objective of the podcast that we were given was that it’s a podcast for people who are in the first year, now to choose what they want to do the special study module ... We thought, you know it would be nice if they’ve got a bit of music, you know some laughter and then some serious bits in between.”

Another group chose to do their podcast as a debate because they believed that the conversational style would appeal to first year students.

Promote engagement and motivation

Some students described their experiences of making podcasts as motivational and interesting. One group said that they enjoyed the experience because they were engaged with an interactive process to create new things which they do not normally do in other modules.

“Well I think first of all it’s very different to other modules. I think it’s something people would like to do because it’s not a normal medical module you would say, because you don’t normally associate a medical module with podcasting and things. So first of all it allows people maybe to enjoy what they are doing, and second of all it allows you to learn in a more...kind of more interactive way, which kind of helps people learn anyway too, in a certain way.”

Another group also appreciated the opportunity to get to know the availability of new multi-media technologies for supporting teaching and learning.

“I mean it just made me appreciate how we can use different types of media to learn podcasts and video podcasts and the poster itself that’s another thing we’re doing. It’s like using different media to learn just makes it a bit easier. It breaks a bit of monotony just reading lecture slides. I suppose in future if we had podcasts of lectures available it would be quite nice to be able to listen to them while you’re revising for exams. It made me appreciate that you know there other forms of media available and it can help us.”

Their interest also arose from becoming familiar with podcasting and using new software such as Audacity to create something.

“And in another way it was a way for us to familiarise ourselves with different attributes of distribution of information, i.e. podcasting and also technology, editing software capturing it...things like that.”

Enhance team-working skills

Students highlighted the importance of working in groups, especially for medical students. One group believed that developing podcasts was a valuable way to enhance team-working skills.

“Yeah I mean, all of us from the start have been put into groups, and I think it’s a key concept in working as a doctor especially, you have to work in a team all your career I think, so that’s what the medical school are trying to get to and get us into the habit of

being able to work in a team, and identify key strengths and weakness in a team and develop yourself in different roles within the team.”

Students talked about how they practised team-working skills such as planning, responsibility sharing and task allocation during the development process. Most groups made plans together and shared responsibilities to ensure that each member could make an equal contribution to the product. They divided tasks so that each was responsible for researching a particular aspect of the topic, preparing the script for that bit and recording an individual session on that aspect. Some groups recorded a ‘round table discussion’ as it happened and did not edit. Others recorded separate contributions and edited them together.

“... it is just a group effort, the way we designed our podcast is we split it up Some of us were doing cell biology, pathology, introduction, conclusion genetics, and we recorded separately and then just put it together. Rather than all doing it at the same time this was an easier way of doing it.”

Some reflected on their group work experience. One realized how important organization skills were for the success of team work.

“... because we’re always at the receiving end of listening to lectures...so we don’t get to appreciate how much effort goes onto creating something like this. So in doing this we actually got to appreciate how much organising goes into something like this.”

Another reflected that one lesson learnt from the team development process was to plan the activities well in advance.

‘... we planned it, got the script together, organised it, and said this is what’s going to happen and at the end this is going to be the outcome, that made it a whole lot easier, rather than starting with nothing and then trying building up from there.’

Download statistics and questionnaire data

In addition to collecting views from student producers, download statistics were collected from the medical school VLE. The results (in Table 1) showed that 565 downloads were recorded over 8 months, indicating that student listeners were generally interested and motivated to listen to podcasts created by peers.

Table 1: Podcast download statistics

Podcast topic	Number of times downloaded
Designer babies	128
Diabetes	104
Genetic screening	114
Genetic testing	98
Haemophilia	121
Total downloads	565

Students who downloaded the podcasts were invited to complete a short online anonymous questionnaire to collect general views from student listeners. The questionnaire responses were shown in Table 2.

Table 2: Questionnaire responses

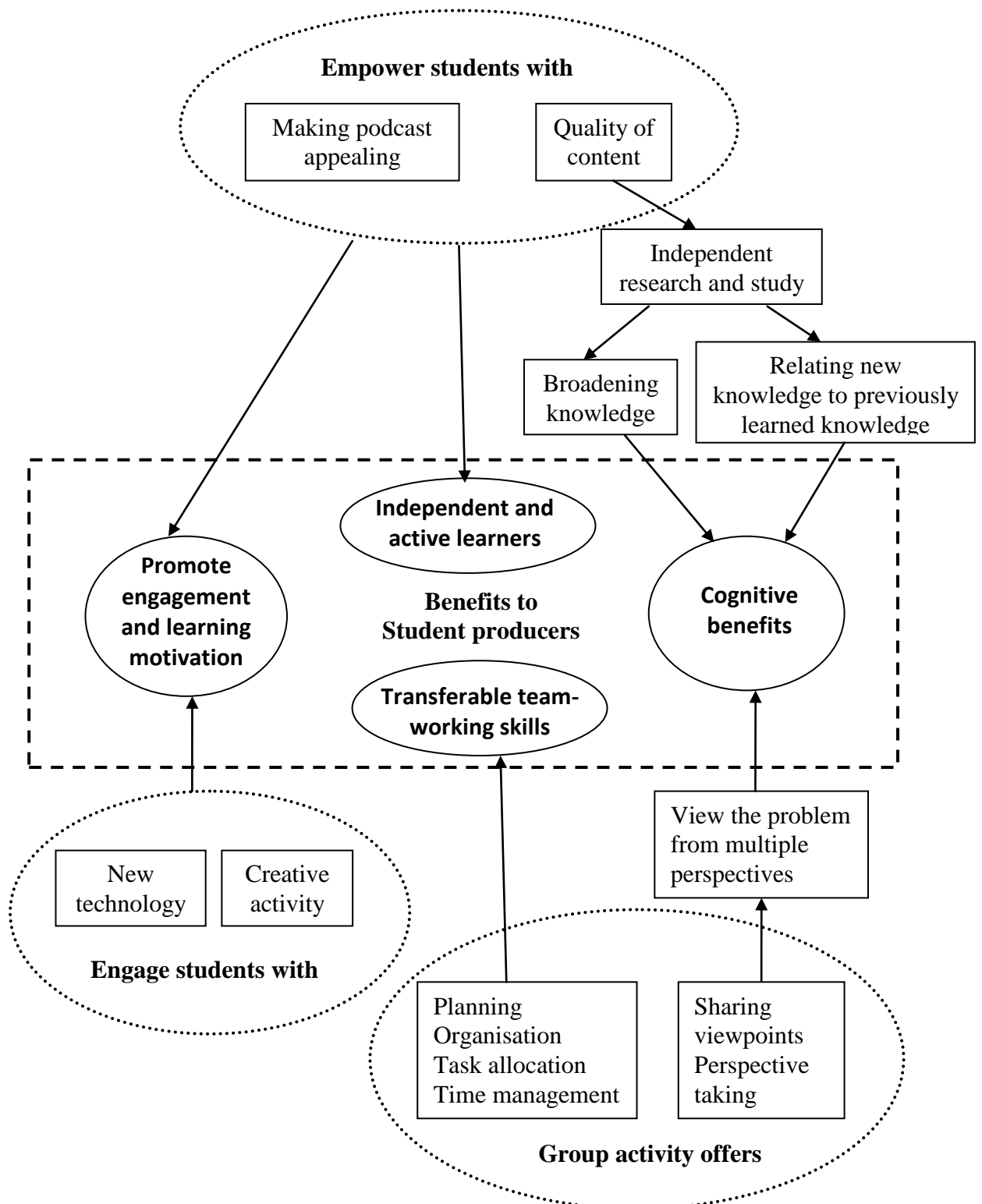
Question	Response
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Which year of your course are you in?	Year 1 – 11 Year 2 - 25 Other years – 0
If you are a second year did you take the genetics special study module?	Yes - 19 No - 6 Not applicable – 11
I found the content of the podcast(s) interesting	4.1
I found the style of presentation engaging	3.7
I would like to listen to more student-produced podcasts	3.9
I think podcasts of other course material would be useful	4.2

Questions 1 and 2 asked which year of the course the students were in and if they were second years if they had taken the genetics module. The remaining questions used a Likert scale from 1 (strongly disagree) to 5 (strongly agree).

The responses showed that most students who downloaded the podcasts (53 per cent) were students who had taken the module. The responses were overwhelmingly positive, both concerning the content and the use of podcasting in this context. They showed that these students were generally interested in podcasts generated by peers, and found the student-led discussion or debate style engaging. They said that they would like to listen to more student-generated podcasts, and would like this approach for other courses.

Figure1: Benefits to student producers



Discussion:

One of the aims of this project was to develop students' understanding of ethical issues surrounding modern genetics. It was clear that the participants had engaged with this aim. Student-generated podcasts could offer an innovative approach to engage learners with the activity and persuade them to conduct more independent research and study of the issues, therefore offering them an opportunity to develop understanding of ethical issues of modern genetics through broadening knowledge, relating knowledge and perspective-taking. It was also clear that student-generated podcasts could be used as a tool to disseminate information relevant to genetics to other students who were not taking the module. However, it is too early to determine whether the podcasts will motivate following cohorts to study genetics.

Results from this small pilot group also highlighted other benefits, particularly in developing team-working, organisation and other transferable skills which were perceived crucial for medical students.

The aims of the approach used were to benefit both the students who made the podcasts and those who listened to them. Whilst it is clear that the student producers benefited on several levels, there was also a positive impact on the student listeners who have identified podcasts created by peers engaging and motivating. However, as data were collected through a simple online questionnaire, a further larger study will be necessary of the effect of student-generated podcasts such as these on other students.

Although this approach was used within a genetics-related course, it seems that the effectiveness of student-generated podcasts can have a similar impact on students studying other subjects. It would be of interest to explore whether this approach can enhance students' understanding of subject-specific difficult or complex concepts, particularly in relation to improving their learning outcomes.

Feedback collected from this small pilot group seems to be almost entirely positive. A further area for study will be any negative aspects of this approach. Possible areas to look into may include why some students are not interested in podcasts created by peers or why some of them would not be engaged in developing their own podcast.

Conclusion

Student-generated podcasts have been found beneficial to both the cognitive as well as motivational aspects for student producers' learning. Due to the success of this approach with the medical students, we hope to make the podcasts available to a wide group of students as a useful learning resource. We are extending it to science undergraduates taking genetics courses. In particular we are keen to engage first-year genetics specialists in considering ethical issues surrounding modern molecular genetics.

Another new development planned is for students to interview leading local researchers on their work and to prepare short overviews to engage students' interest and enthusiasm for genetics. We have already trialed this on a limited scale in the Integrated Science programme at the University of Leicester. We intend that this resource of interview material will become part of the Virtual Genetics Education Centre being developed by the GENIE Centre of Excellence of Teaching and Learning, to allow a much wider dissemination of the content.

One problem with the pilot study was lack of sufficient portable digital recording equipment, restricting the choice of material that could be recorded. We now have a class set of MP3 recorders which will allow students more flexibility in recording including making possible interviews of other students and researchers, in a classroom setting and 'in the field'.

Another problem was the quality of the content, which may not have been entirely accurate or suitable for widespread distribution. Staff involvement to a certain level may be necessary. A student-produced, staff-moderated wiki might be a good solution for exchanging ideas and making comments between student contributors and staff members. Medical wikis have been proposed as a rapidly-evolving method of dissemination of current practice, and these would be easily adapted for a teaching and learning environment.

References

- Chan, A. and Lee, M.J.W. (2005) An MP3 a day keeps the worries away: Exploring the use of podcasting to address preconceptions and alleviate pre-class anxiety amongst undergraduate information technology students, in D.H.R. Spennemann and L. Burr (eds) *Good Practice in Practice: Proceedings of the Student Experience Conference*, Wagga Wagga, NSW, 5-7 September, 58-70.
- Downward, S., Livingstone, D., Lynch, K. and Taylor, R. (2007) Podcasting to enhance Geography field-based teaching and learning. Paper presented at the Association of American Geographers Annual Meeting, San Francisco, USA, 17-21 April.
www2.le.ac.uk/projects/impala2/presentation/impala2_workshop/presentations/stuart/view (accessed 21 Jan. 2008).
- Edirisingha, P., Rizzi, C., Nie, M., and Rothwell, L. (2007) Podcasting to provide teaching and learning support for an undergraduate module on English Language and Communication, *Turkish Online Journal of Distance Education*, **8**, 3, 87-107.
- Hargis, J. and Wilson, D. (2005) *Fishing for learning with a podcast net*.
www.unf.edu/dept/cirt/tech/podcast/HargisPodcastArticle.pdf (accessed 15 Jan. 2008).
- Huann, T.Y. and Thong, M.K. (2006) *Audioblogging and podcasting in education*, Edublog.net.
edublog.net/astinus/mt/files/docs/Literature%20Review%20on%20audioblogging%20and%20podcasting.pdf (accessed 15 Jan. 2008).
- Jarvis, C. and Dickie, J. (2008) Supporting experimental field-based learning: Interfaces and archives. Poster presented at Learning Futures Conference 2008, University of Leicester, 8-9 January. www2.le.ac.uk/projects/impala2/presentation/impala2_workshop/presentations (accessed 07 March 2008).
- Jenkins, M. and Lonsdale, J. (forthcoming) Podcasts and students' storytelling, in G.Salmon and P.Edirisingha (eds), *Podcasting for learning in universities*. McGraw Hill.
- Lee, M.J.W. (2006) Using blogs and podcasting to facilitate delivery and self/peer evaluation of oral presentation assessments, *Learning Technology Newsletter*, **8**, 4, 28-30, October 2006.
- Lee, M.J.W. and Chan, A. (2007) Reducing the effects of isolation and promoting inclusivity for distance learners through podcasting, *Turkish Online Journal of Distance Education*, **8**, 1, 85-104.
- Lee, M.J.W., McLoughlin, C. and Chan, A. (2007) Talk the talk: Learner-generated podcasts as catalysts for knowledge creation, *British Journal of Educational Technology*, Published article online. www.blackwell-synergy.com/doi/ref/10.1111/j.1467-8535.2007.00746.x (accessed 27 Feb. 2008).
- McLoughlin, C., Lee, M.J.W. and Chan, A. (2006) Fostering reflection and metacognition through student-generated podcasts. Australian Computers in Education Conference (ACEC), Cairns, 2-4 October.

McLoughlin, C., Lee, M.J.W. and Chan, A. (2007) Promoting engagement and motivation for distance learners through podcasting, *EDEN conference proceedings 2007*, Naples, 13-16 June 2007.

Miller, D. (2007) University of connecticut – Beyond lecturecasting: Using podcasts for discussion and student content creation. SloanCWiki.

www.sloan-c-wiki.org/wiki/index.php?title=University_of_Connecticut_-_Beyond_Lecturecasting:_Using_Podcasts_for_Discussion_and_Student_Content_Creation (accessed 27 Feb. 2008).

Murray, C. and Sandars, J. (2007) Digital storytelling: forging identity through voice and three-dimensional reflection. *Programme and Abstracts of ALT-C 2007*, Nottingham, UK, 4-6 September, 30-31.

Ng'ambi, D. (forthcoming) Podcasts for reflective learning, in G.Salmon and P.Edirisingha (eds), *Podcasting for learning in universities*. McGraw Hill.

Vygotsky, L.S. (1978) *Mind in Society: the Development of Higher Psychological Processes*. Cambridge, Harvard University Press.