This paper describes part of an ongoing project aimed at examining and comparing the effectiveness of educational podcasting for both the producers and consumers of podcasts, in terms of perceived as well as actual learning. A group of students undertaking an online, graduate-level educational technology course are given the opportunity to experience podcasting in two roles: firstly, as learners listening to podcast-based instructional material for their course, and secondly, as teachers responsible for developing and distributing podcasts within their own professional contexts. Web-based surveys and reflective writing assignments are the primary methods used to elicit the views and experiences of these students from the different perspectives.
Abstract: This paper describes part of a project aimed at examining and comparing the effectiveness of educational podcasting for both the producers and consumers of podcasts, in terms of perceived as well as actual learning. A group of students undertaking an online, graduate-level educational technology course were given the opportunity to experience podcasting in two roles: firstly, as learners listening to podcast-based instructional material for their course, and secondly, as teachers responsible for developing and distributing podcasts within their own professional contexts. Web-based surveys and reflective writing assignments were the primary methods used to elicit the views and experiences of these students from the different perspectives.

Introduction

Podcasting has enjoyed phenomenal growth in mainstream society, alongside other Web 2.0 technologies that enable Internet users to author and distribute rich media content. Jon Udell (2005, cited in Campbell, 2005) attributes this growth to five main factors:

1. The pervasiveness of the Internet;
2. The rapid growth of broadband;
3. The widespread availability of the multimedia personal computer;
4. The blurring of the distinction between streaming and downloading media content; and
5. The rapid uptake of portable MP3-capable devices.

Similarly, podcasting is becoming increasingly popular in the education arena. Since Fall 2002, various courses at Georgia College & State University (2005), including a number of study abroad courses, have been “iPod-enhanced” to include a diverse range of audio material ranging from lectures and audio books to language study material and music. In August 2004, in arguably the most highly publicized instance of the early adoption of educational podcasting at an institutional level, Duke University (2006) distributed 20-gigabyte iPods to its 1,650 commencing students, pre-loaded with orientation information. Administrative and academic materials in MP3 format are available for students to download from the Duke Web server and via Apple iTunes. In a smaller-scale project, Drexel distributed iPod Photo players to its School of Education freshmen in September 2005 (Read, 2005). Other major universities that have adopted podcasting at an institutional level include University of California, Berkeley (2006), Princeton University (2005), Stanford University (n.d.), Purdue University (2006), University of Virginia (2005), and University of Wisconsin-Madison (2005). Applications to teaching and learning range from recording lectures as a means of freeing up class time for interaction, to exposing students to international perspectives by inviting guest speakers from other countries to give talks. The technology is also being used to empower students and encourage active learning through having them create their own podcasts. For example, journalism students gain practice in producing their own grassroots talk shows (Diverse Issues in Higher Education, 2006).

In the K-12 sector, podcasting has also been taken up enthusiastically, although there is only a modest amount of published literature pertaining to research in this area. Room 208 (Sprankles, 2005; Apple Computer, 2005) is an excellent example in which third and fourth grade students work together to produce web log (blog) postings and podcasts on topics of their choosing, to share significant insights and activities with an Internet audience.
The strategy has proved extremely successful in exciting, engaging, and motivating students to read, write, and do research, while honing their oral presentation skills. The students offer constructive criticism to one another, thereby engaging in collaborative learning. Crawford, Smith, & Smith (2005) outline two in-progress case studies involving podcasting within elementary school settings, which provide an excellent contrast between learner-centred and teacher-centered uses of the technology. The first case study involves the introduction of podcasts into a fourth grade Language Arts/Reading class. The students develop their own audio and video podcast presentations to share their poetry and creative writing works with the rest of the school community through their school-wide televised news program. In the second case study, a fourth grade mathematics teacher develops audio and video podcasts, as well as accompanying text and graphics files, with the primary aim of providing online, just-in-time homework support. New content is made available via the Internet each night to enhance the students’ understanding of their homework assignments and support them during their homework period, as well as to aid their parents’ understanding of the materials and homework expectations.

The Educational Benefits of Podcasting: So, What’s New?

Schlosser (2006) reminds us that “[t]he use of audio in education is not new, but is experiencing a renaissance fuelled by the ubiquity of portable audio players, broadband Internet, and software tools that allow the relatively easy creation and distribution of audio files” (sec. 2, para. 1). A major feature that differentiates modern digital audio technologies from older technologies is the large and continually growing storage capacities of portable MP3-capable and other “companion media” devices, which allow the user to both time-shift and place-shift their use of downloaded content for truly “on-demand” consumption.

Owing at least partly to the fashionableness of the word “podcast” (cf. Oxford University Press, 2005), many authors and educators use it extremely loosely, to refer to any digital audio recording distributed via the Internet, especially where iPods are involved. A portmanteau of the words “iPod” and “broadcast,” the term was originally coined by Adam Curry (2004), of MTV fame, to refer to the distribution of digital audio files through Really Simple Syndication (RSS) 2.0 enclosures (RSS Advisory Board, 2005). Despite the name, equipment capable of playing podcasts, which are typically MP3 (MPEG Layer 3) files, is not limited to iPods, but encompasses a range of portable devices, including dedicated MP3 players, handheld computers, and tablet PCs, as well as many modern mobile phones and personal digital assistants (PDAs). In fact, the use of such a device is optional, and users without access to such devices can simply listen to the content on their desktop computers – According to a survey by Bridge Data, over 80% of downloaded podcasts never make it to a portable device (Dixon & Greeson, 2006).

The purported benefits or strengths of educational podcasting include:

- The ability to leverage the strengths of audio as a teaching and learning medium;
- The fact that the technology is low-cost and low-barrier, which simplifies its uptake by both educators and learners;
- The subscription-based nature of RSS (RSS Advisory Board, 2005), which allows learners to add and cancel subscriptions at any time, as well as to filter and search content downloaded from a single feed, or across multiple feeds, opting to listen only to content that is of interest to them;
- The ability for bandwidth-intensive files to be automatically “dripped in” as they become available, thereby avoiding a “click and wait” situation, even in bandwidth-constrained environments (Curry, 2004);
- The high level of “social cachet” of portable MP3 players (Clark & Walsh, 2004);
- The opportunities presented for mobile learning (Lee & Chan, 2006).

While there is a wealth of research on audio as a teaching and learning medium, much of which dates back to the days of radio and audio cassette tapes in education (e.g. Bates, 1981; Durbridge, 1984; Romero-Gwynn & Marshall, 1990; Power, 1990; Scottish Council for Educational Technology, 1994; Kates, 1998), it is unclear from the existing literature how to best harness the new features offered by the nascent breed or “incarnation” of audio technologies in pedagogically sound ways, and apply these appropriately to various educational situations. Podcasting, in particular, offers the “best of both worlds” by combining the benefits of the broadcast nature of radio with the flexibility, learner control and personalization afforded by recorded audio, and presents a host of opportunities for application to a range of learning scenarios, by having teachers and learners act as consumers and/or producers of the podcast material.
Teachers and Learners As Consumers and Producers of Podcasts

Most theories of learning, such as those of Dewey, Piaget, and Bruner, suggest that for learning to be effective it needs to be active – it is not enough merely to observe, read or listen; learners have to do something with the material. Many educators seem to focus solely on instructor-centered uses of the technology, such as the dissemination of recorded lessons or lectures, and overlook the learning value that may be afforded through letting learners create their own podcasts. This having been said, there is still potentially tremendous value in having learners listen to podcasts, and it is possible to actively involve them in the process. In an instructor-driven audio podcast, a learner may be stimulated to think by being asked to respond silently to questions, make mental notes, and/or summarize. Active learning can also be achieved by encouraging learners to interpret facts and draw connections between them, transfer knowledge to new situations, relate knowledge to daily life, solve problems, and make inferences (Gachuhi & Matiru, 1987). Moreover, instructor-distributed podcasts need not consist of lengthy monologues spoken by the teacher. In a project led by Chan and Lee (2005), first year undergraduate students listened to short, three to five-minute talkback radio-style podcasts produced by a group of volunteer second year students who had completed the class in an earlier semester. The roles of consumer and producer also need not be mutually exclusive: Lee (2006) proposes the use of podcast-enhanced collaborative blogs to allow students to share their oral presentations with their instructor and peers, as well as acting as a vehicle for feedback and peer evaluation. Last but not least, it is possible for both teachers and learners to become active producers and consumers of asynchronous, voice-based discourse in an online community (cf. Mobasoft, 2006; YackPack, 2006).

The overarching project, of which the study described in the present paper forms one portion, was established in response to the multitude of possible educational uses of podcasting that place teachers and learners in the roles of consumers and/or producers of the content, and the correspondingly scarce amount of literature that focuses on pedagogically appropriate applications of its unique features in response to a given circumstance. The researchers defined the following questions as a broad basis for their investigation:

- What do in-service K-12 teachers perceive as pedagogically appropriate uses of podcasting in their classrooms, that cannot be achieved through the use of other audio technologies?
- What are the different educational benefits to be gained by having learners (a) create/produce the content, and (b) listen to/consume the content?
- What are suitable assignments of the roles of “consumer” and “producer” to the various stakeholders in the educational process (learners/peers, teachers, administrators, parents, outside world), for various types of learning scenarios?
- What operational barriers to the uptake of podcasting in the K-12 classroom exist in both the podcast production and podcast consumption process, and how can these be overcome?

Context and Participants

The participants in the research were in-service K-12 teachers undertaking a fully online course, EC&I 832: The Internet and Curriculum Integration with the University of Regina, Canada. EC&I 832 is one of a series of graduate-level ICT in education courses offered by the university’s Faculty of Education. Its basic purpose is to explore and critically evaluate web-based curriculum-related frameworks, and to examine learning theories appropriate to the effective use of the Internet in instructional environments. In this course, students study their beliefs about teaching and learning and the relationship of technology to these beliefs. They critique learning theories and their impact on educational uses of ICT; current views on curriculum and technology integration; “best practices”; and curriculum-based examples and templates for “mining” the Internet (University of Regina, 2003). The students of EC&I 832 formed a particularly fitting group of participants for the study and were expected to provide both interesting and valuable insights in relation to the aforementioned research questions, as they were experienced teaching practitioners, in addition to being learners through their enrolment in the graduate-level course.

The content of EC&I 832 had been recently updated to reflect the emergence and growing levels of adoption of Web 2.0 technologies, including blogs, wikis, RSS, and podcasting, in the K-12 classroom, both in Canada and internationally. As part of the updated course curriculum, the participants in the study gained experience with educational podcasting through a combination of synchronous online workshops and self-paced web-based tutorials. In addition to receiving exposure to sample podcasts that represented what the researchers considered to be exemplars of work in this area, they were given the opportunity to “play and learn” with/about the technology in a university-supported “sandbox” environment. The students were also strongly encouraged to perform wide reading...
of both popular/mainstream as well academic literature, to supplement the prescribed activities. Their exploration culminated in an assignment in which they were required to create podcasts for use in their own educational settings, and critically reflect on the possibilities and problems that arose from both a practical and pedagogical standpoint.

Methods

Data Collection Procedures

The study was based on a mixed methods approach in which quantitative and qualitative data was obtained through web-based surveys, with a series of reflective writing tasks being used to gain deeper and richer insights into the participants’ views and experiences.

The data collection procedure consisted of two phases. Phase One began with the students obtaining and listening to sample podcasts containing material relevant to the EC&I 832 class. Following this, they completed an online survey as learners consuming the podcast material. The first part of this survey contained a number of questions that requested demographic background data relevant to both phases of the study. The students also wrote reflections on their experiences, which they posted on a collaborative blog shared by all students in the class, in response to a number of stimulus questions.

In Phase Two, the students were asked to review a number of contemporary articles on podcasting and its educational uses. Guided by synchronous workshops and self-paced tutorials, they completed an assignment in which they planned and produced podcasts for their own students, before completing a second online survey, this time in relation to their role as teachers producing podcast material. Once again, they were asked to post reflective comments to the class blog, with a number of questions supplied to help scaffold the reflection.

The two surveys were administered on a survey tool developed in-house at the university that maintained anonymity of the responses. However, to facilitate the matching/co-relating of the survey responses from the two phases, students selected random “Participant IDs,” which they were asked to input at the commencement of each survey. These IDs were used solely for the purpose of pairing corresponding survey form submissions, and did not bear any relationship whatsoever to the identities of the students.

Data Analysis Procedures

At the time of writing, the data analysis is still in progress. Simple descriptive statistics in the form of frequency tables and cross tabulations are being performed on the quantitative survey data. Content analysis techniques are being applied to analyze the responses to the open-ended survey items, as well as for the reflective comments extracted from the blog. Content analysis is a generic name for a variety of means of textual analyses that involved comparing and categorizing a corpus of data (Schwandt, 2001; Neuendorf, 2002). Although it originated in communications research, it is now widely used in the analysis of computer-mediated conferencing (CMC) transcripts across a variety of disciplines.

A simple thematic content analysis approach is being used to analyze the qualitative survey data. This consists of the following: For each survey item, all responses are first read at face value to produce a preliminary (candidate) list of themes or issues. This list is gradually refined as subsequent passes are made through the data, with the content being reviewed in greater detail and common strands factored out. As part of this iterative process, categories are added, deleted, renamed, combined, and divided as necessary. Eventually, each response is categorized according to the themes/issues identified, to reveal those themes/issues that stand out as being the most pertinent, or worthy of mention. All in all, the aim of the process is to attempt to present a broad, overall or “birds’ eye view” picture of student attitudes and reactions towards their experiences as teacher-producers and learner-consumers, as seen in their responses to the survey questions.

For the purpose of analyzing the blog postings, a variation on Berelson’s (1952) content analysis approach, described as “a research technique for the objective, systematic, quantitative description of the manifest content of communication” (p. 18), has been adopted. The approach involves aggregating the blog postings and searching the text therein for verbal indicators of the particular themes and variables as defined by the research questions. The unit of analysis in this case is the sentence or phrase, which may be clustered together as themes. The instances found are collated, classified, and counted, with each of the coders’ decisions compared to ensure inter-rater reliability. Finally, the results of the coding process are combined and the incidence of the target variables reported on.
Results and Discussion

A comprehensive analysis of the results will be presented at the conference.

Conclusion and Future Work

The results obtained through the full analysis of the survey and reflective writing data will inform the researchers’ decisions on subsequent steps to take to acquire a greater level of understanding of the views and experiences of in-service teachers in relation to the project’s overarching research questions.

Although there is much anecdotal evidence on the Internet and in the academic literature attesting to the viability and effectiveness of podcasting as an educational tool, there is limited empirical data available to support the generalization of these claims to a wide range of teaching and learning scenarios. The small amount of data present in the existing literature focuses mainly on uptake levels and perceived learning through the use of the technology within a single, narrowly defined context. The researchers plan to continue with their project by conducting comparisons between the perceived and actual learning resulting from a range of podcasting applications in various educational contexts, with students acting as content producers, content consumers, or taking on both roles simultaneously. It is hoped that one of the outputs of this project will be a taxonomy of reusable designs and accompanying guidelines to inform choices made by educators wishing to integrate pedagogically appropriate uses of podcasting into their professional practice.

References


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