

Vodcasts: Are they an effective tool to enhance student learning? A Case Study from McMaster University, Hamilton Canada.

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Abstract: As universities turn to technology to become more learner-centred and address challenges created by increasing class sizes, changing consumer expectations, and increasing numbers of disability accommodation requests it is important to test the utility of technology solutions. This presentation describes a study to determine the effects of introducing vod-casting to a multi-sectioned, Level I Social Sciences course and to two medium sized, 400 students Level II Social Sciences' courses. Both faculty and students were surveyed to determine the impact of vodcasting. Questions that will be explored during the session include: how did students use podcasts; did the students perceive benefits to using the podcasts; did podcasting impact learning; was podcasting perceived as helpful to students with accommodation needs; what were the impacts of podcasts on instructors; do deep learners use and perceive benefit of podcasts differently than surface learners; and, how can podcasts be effectively introduced within existing infrastructure.

“The context of higher education is changing. The convergence of social, technical, and intellectual forces has pushed higher education to the tipping point of a significant transformation. The forces of change have raised serious concerns about the quality of the educational experience in higher education. These realities will open the door to significant pedagogical redesigns that involve integrating conventional and innovative technologies.” (Garrison and Vaughan, 2008, p. 143)

Why did we do it?

A number of challenges face higher education in North America. Statistics Canada data indicate a 25% increase in the number of individuals in the age bracket 15 years+ during the time period 1990-1999 (Stats Canada, 1999). Canadian university enrolment is anticipated to grow nationally by 70,000 – 150,000 full-time students over the next decade (AUCC, 2007). At McMaster University in Hamilton, Ontario Canada undergraduate enrolment has increased by more than 50% since 2000-2001 (Busch-Vishniac, 2007). This increase has resulted in increased class sizes and a shortage of space on many university campuses within Canada. At the same time instructors are reporting a decrease in attendance rates at traditional lectures and an increase in the number of requests to provide assistance to students with accommodation needs (e.g., note takers). As well, many in higher education are observing a change in how students prefer to acquire information. This combination of challenges forced us to consider alternative educational delivery methods. Vodcasting emerged as a technology that showed promise as a potential tool to enhance undergraduate student teaching and learning (Hurst & Waizenegger, 2006).

What did the literature tell us?

Podcasts, developed during 2004, have received wide spread use in part, because they can be downloaded automatically using software such as RSS (Really Simple Syndication) (Bullis, 2005). Approximately a year later, vodcasts were introduced. Initially, most podcasts were music (22%) and comedy (9%) whereas, erotica was the

number one kind of vodcasts accounting for more than 11% of the initial vodcasts (Bullis, 2005). In 2005, education podcasts accounted for less than three percent of podcasts and there were virtually no vodcasts (Bullis, 2005). Six months later, in late 2005, Campbell (2005) wrote about the possibilities that pod/vod casting could be produced for higher education. Campbell (2005) states, “done well, podcasting can reveal to students, faculty, staff, communities – even the world – the essential humanity at the heart of higher education.”

During the next several years there was a move towards increased use of pod/vod casts both within university level classrooms (both by instructors and students) and by universities for recruiting and conveying non-curricular information to students.. The literature for next several years contains a number of articles that describe individual classroom use of pod/vod casts (e.g., Lim, 2005; Cebeci and Tekdal, 2006; Hurst and Waizenegger, 2006; Malan, 2007) and the possibilities that pod/vod casts provide for education (e.g., Gordon, 2007). At the same time other uses for podcasts at the university were being explored. For example, Chan and Lee, (2005) describe the use of podcasting to address preconceptions and alleviate pre-class anxiety among a group of information technology students at Charles Sturt University. Read (2005) describes the split that was emerging among faculty about the place that podcasting should have in teaching.

By 2007 Canergie Mellon published “A Teaching with Technology White Paper” on Podcasting. In this paper the author laments that podcasting may only provide a way to extend the reach of universities as opposed to enhancing undergraduate education (Deal, 2007). The rapid growth of pod/vod casting and the lack of published literature on the effectiveness of pod/vod casting as an effective learning tool created the need for studies like ours that look at pod/vod casting as a learning tool and attempt to measure its effectiveness.

How did we do it?

An ex post facto research design was employed to assess the effectiveness of vodcasts as a learning tool across a large multi-sectioned first year course and two large single section upper year courses (number of students = 1675). The experimental focus was on both the student and instructor experiences. Data on the student experience was gathered through an on-line survey and through focus groups. A mark incentive ensured a high participation rate in the on-line survey (>80%). Data on the experience of the three different instructors was gathered through interviews with the instructors.

To assess if podcasts are an effective learning tool, a number of success indicators were established. The indicators have been grouped into four categories which include: student satisfaction, educational outcomes (i.e., grades), instructor satisfaction and financial feasibility. The indicators have been developed into a series of questions.

Is podcasting an acceptable learning tool to students?

- a. How often do students access the podcasts?
- b. How easy do students find podcasts to use?
- c. How do students make use of podcasts?
- d. Do students perceive a learning benefit from podcasts?
- e. Do students with accommodation needs report benefit from podcasts?

Does podcasting enhance educational outcome measures?

- a. Do students in podcast classes earn higher grades than in non-podcast sections?

Is podcasting an acceptable tool to instructors?

- a. What are the positive and negative impacts reported by instructors who use this technology?

Is podcasting economically feasible?

- a. What are the costs involved with podcasts?
- b. Can those costs be sustained?

What did we learn?

The research indicates that students find vodcasts an acceptable learning tool. Students report that the vodcasts were used frequently and that they were easy to use. As well, students perceived that podcasts benefited their

understanding and retention of knowledge of course material. Students reported occasionally using the podcasts following classes to review specific concepts; but, the heaviest use of podcasts was in the week prior to tests in exams for clarifying material prior to assessment.

Instructors perceived that vodcasts had little to no detrimental impact on their workload. They had anticipated that vodcasts would increase their workload. Instructors perceived a negative impact on attendance. Several are now exploring assessment techniques to encourage lecture attendance (e.g., the use of minute papers that are randomly assigned and evaluated). One of the biggest challenges that instructor's reported was the perceived impact that vodcasts could have on class culture. Instructors anticipated that with growing class sizes and tools like vodcasts that may make lecture attendance less critical that they will face increased challenges in developing a class culture that is conducive to student learning.

The outcomes section has been organized according to the indicators of success provided above.

Is podcasting an acceptable learning tool to students?

a. How often do students access the podcasts?

Only 11% of the students in the Experimental classes had encountered podcasts in previous University classes although 18% of these students had encountered podcasts in some other form prior to the course (e.g., radio reports, sports broadcasts etc...).

The results show that students frequently accessed the podcasts. Table 2 summarizes student access to the podcasts. There were more than 13,000 visits by students to the podcast web sites and 3,579 visits were from discrete visitors (i.e. came from different IP addresses).

Experimental Class	Enrolment	# Visits	Discreet Visitors
Exp 1 Prof A – Econ	258	441	270
Exp 2 Prof B – Econ	157	623	259
Exp 3 Prof B – Econ	108	486	217
Exp 4 – Prof C Soc Sci	510	4315	1239
Exp 5 – Prof C Soc Sci	360	7136	1594

Table 1: Podcast access during Winter, 2007. The number of visits indicates the number of times the podcast web site was accessed during the term and discrete visitors indicates the number of different IP addresses that accessed the web site.

Data on podcast usage was collected on a daily basis for each class. There is a tight correlation between usage spikes and testing dates in all five classes. Students were asked to describe how they used podcasting. More than 50% of the students in the experimental classes reported using podcasts while studying for exams and for occasional review. As well, more than 30 students from the non-podcast sections reported gaining access to the podcasts (e.g. via a friend in another section of the same course). The fact that students from non-podcast sections attempted to gain access to the podcasts indicates that they perceived a value to the podcasts.

b. How easy do students find podcasts to use?

75 % of the students reported that podcasts were easy to very easy to use (Figure 1).

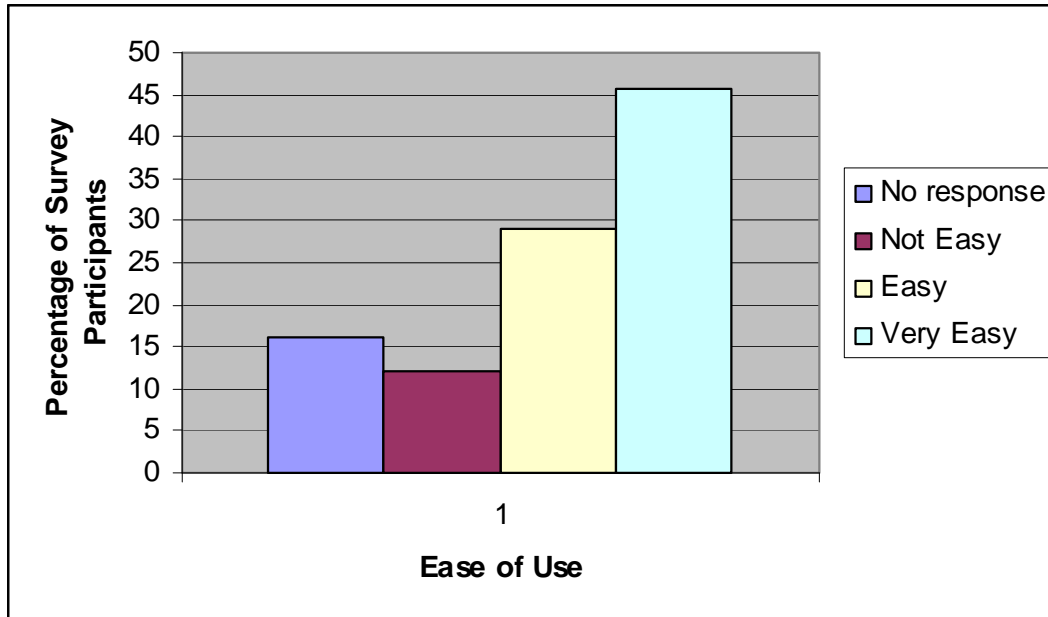


Figure 1: Student response when asked about how easily they could access the podcasts (n=1038).

Students reported some problems with the quality of sound in the podcasts. Students reported these difficulties via the technical support email that was available with the podcasts (n=3) and directly to technical support staff at the lectures (n<10). This is a commonly reported problem at other institutions that have used podcasting. Often it is a result of a problem with the device that the students are using to listen to the podcast (e.g. computer, mp3 player); but, sometimes it is due to the quality of actual sound capture during the lecture (see section on costs for a solution). As well, a few students initially reported challenges in accessing the podcasts from the internet. Through communication between technical staff and students this was resolved in all cases.

c. Do students perceive a learning benefit from podcasts?

Students reported a learning benefit from podcasts. When students were asked if podcasting improved their overall understanding of course material more than 50% of students agreed that podcasting improved their overall understanding of course material; whereas, less than 6% of the students disagreed (Figure 2). The responses were similar when students were asked if podcasts helped them retain knowledge of course material (Figure 3).

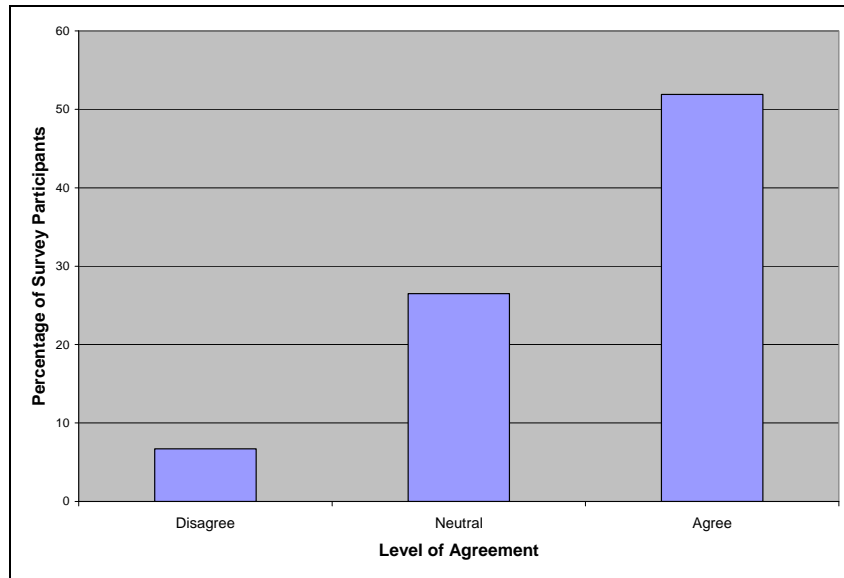


Figure 2: Student’s level of agreement with the statement “Podcasting improved my overall understanding of course material” (n=1038).

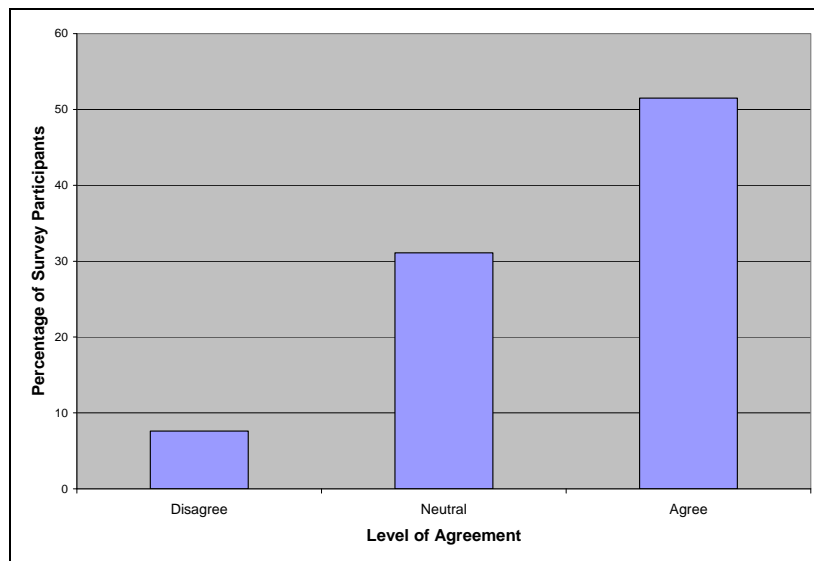


Figure 3: Student’s level of agreement with the statement “Podcasting helped me retain knowledge in the course” (n=1038).

d. Do students with accommodation needs report benefit from podcasts?

Podcasting was found to be a helpful tool to accommodate the learning needs of some disabled students. More than 75% of students who identified that they had a need for accommodation reported that podcasts were helpful. No questions were asked about the specific accommodation need so we are uncertain if the 24% of students with accommodation needs that did not find the podcasts helpful had the type of need that one would expect to be assisted with a podcast. In some cases students reported that the podcasts replaced their need for assistants to act as

note takers. Two students in the podcast classes they reported that due to medical conditions that emerged during the course, they would have had to drop the course if it were not for the presence of podcasts.

Does podcasting enhance educational outcome measures?

a. Do students in podcast classes earn higher grades than in non-podcast sections?

To answer this question comparisons between grades earned in the Experimental and Control sections of the Economics classes only were compared. While there were higher numbers of As and Bs in the experimental classes vs. the control groups, these differences were not statistically significant (Figure 4).

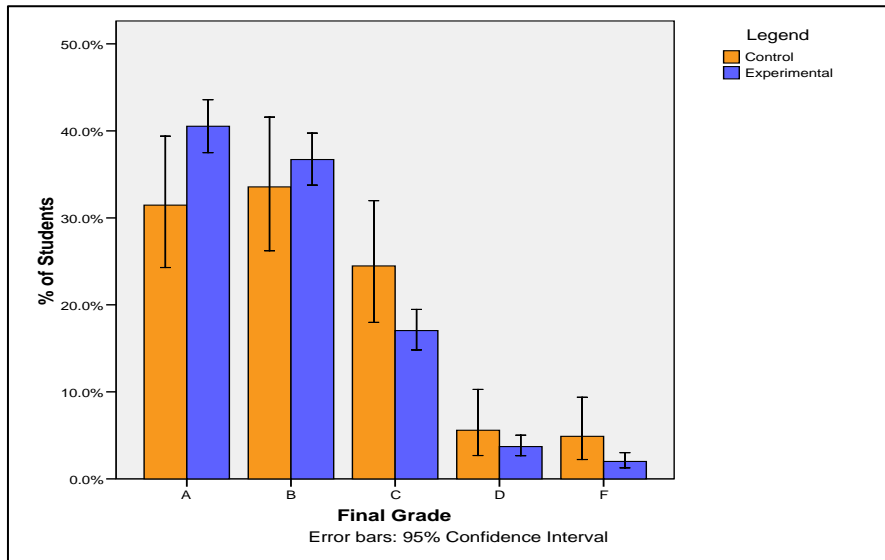


Figure 4: Final grades for students in sections with podcasts (experimental) and without access to podcasts (control) (n=1038).

Is podcasting an acceptable tool to instructors?

a. What are the positive and negative impacts reported by instructors who use this technology?

Instructors, even those initially expressing serious reservations about podcasting, came away with a positive opinion about the experience. Indeed the level of excitement about this experiment was sufficient that faculty agreed to help lead a workshop at a national conference jointly hosted by Ryerson University and McGraw Hill. The title of conference is *Students at the Centre: Transforming Education and Lives*.

Two out of the three instructors stated that podcasting had reduced the number of email/phone and office hour requests for basic clarification of concepts. These two instructors also reported that students who did ask questions via email/phone/office hours asked questions at a deeper level than had previously been experienced.

When instructors agreed to participate in this project one of their major concerns was the impact that podcasts would have on attendance. Data on attendance was intended to be collected as part of the project through head counts at each lecture. The head counts were not consistently collected and the data that was collected is not reliable. The economics instructors indicated that they thought the attendance was slightly lower in the podcast classes. In SOC SCI where there was no control class, the instructor noted only small changes in class attendance rates from previous years. We are continuing to collect data in these courses during the Fall term and are obtaining more accurate and complete head count data. When students were asked to report on their attendance as part of the survey slightly more students (2.5%) reported missing class more than twice/week in the podcast class vs. a typical class. Overall,

the self-report data indicates that students were more likely to attend class when there were podcasts than in a typical class (Figure 5).

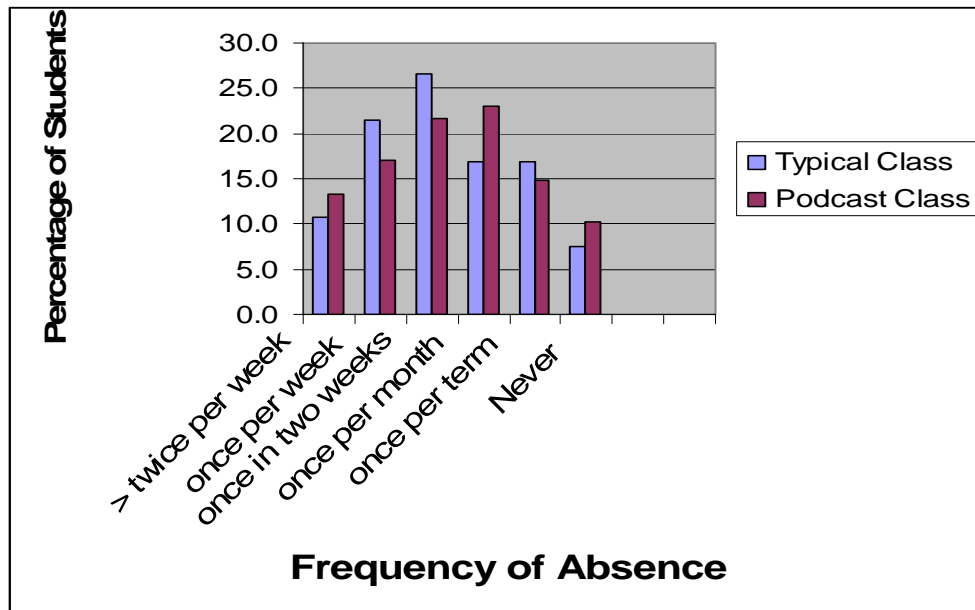


Figure 5: Student response to a question asking about absenteeism in a typical University course and in the podcast course (n=1038).

Is podcasting economically feasible?

- a. *What are the costs involved with podcasts?*
- b. *Can those costs be sustained?*

Currently there are costs associated with the capture and post-production of the podcasts. A technician (student employed on the project) attended each lecture, sets the portable equipment up, remains during the lecture to ensure no technical difficulties arise and spends one to three hours in post production processing prior to making the podcasts available to the students. As well, the Learning Technology Consultant in the Faculty of Social Sciences has been heavily involved in evaluating equipment options, maintaining equipment, developing protocols for production and post-production processing. Approximately 15K has been spent purchasing equipment to capture and process the podcasts. A single lecture had approximately \$50 in associated production and post-production labour costs.

At the start of the academic term there was significant time spent by the technical staff, communicating with students about how to access the podcasts (>50 hours). The unfamiliarity of the method being used to access podcasts was challenging for some students.

The current method of podcast capture and post-production with mobile equipment is not sustainable. It is labour intensive and there are some remaining issues with the quality of sound capture.

What are the implications?

It appears that podcasting when used in large lower level Social Sciences courses has a positive impact on both students and faculty. Benefits included the provision of an easy-to-use review and study resource for a significant number of students, accommodation assistance for some students, and assistance to faculty in providing an enhanced learning experience. The presence of podcasts does not have a significant impact on student grades; although more As and Bs were earned in courses with podcasts. None of these implications are anticipated to be institution or Faculty specific.

Podcasting is an educational enhancement which should be encouraged in large lower level courses. Sustainable alternatives to the current method of producing podcasts need to be explored.

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