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## **Student perceptions of podcasting to enhance learning and teaching in an information systems course**

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### **Abstract**

*Universities are challenged to seek methods to improve student learning. Leading edge technologies, such as podcasts, that put the focus on learner-chosen activities may be one way to accomplish this. This study explored student perceptions of podcasting as a learning and teaching tool in a first semester information systems course within an Australian university. Students were provided with a short podcast to supplement face-to-face lectures. Students were then surveyed to determine their perceptions of the impact of this podcast on their learning. A high number of respondents agreed that they used the podcast, that it increased their understanding of the lecture material and that it assisted their learning in the unit overall. The findings in this preliminary study lend support to the concept that podcasting can enhance learning when used as a supplement to traditional teaching methods.*

### **Introduction**

Universities are constantly searching for new methods to improve student learning. Podcasting is a popular internet-based technology enabling the delivery of both audio and video multimedia. This technology has the potential to enhance the learning experiences of an increasingly diverse student population. To enable teachers and learners to make the best use of podcasting in an educational context, there is a need to better understand how students perceive the use of this technology. It is also necessary to establish whether demographics such as age and cultural background have any impact on such perceptions.

The purpose of this research was to ascertain the perceptions of university students toward podcasting as a teaching and learning tool within an introductory information systems course at an Australian university. Using a survey developed for this purpose, the aim of the research was to determine how respondents engaged with the technology in order to assist with their learning in the unit. The study identified which parts of this technology assisted them in learning the content and to what extent. Understanding these student perceptions can lead to more effective uses of podcasting by teaching professionals in the future. The establishment of student interest in podcasting through this preliminary study will determine the direction of future research into the use of podcasting and other emerging technologies.

## Mobile learning

Compared to that of previous generations, there has been a change in attitudes and learning styles among university students (Taylor and Eustis, 2006). These evolving characteristics pose a challenge to higher education institutions as students are reported to be 'less-engaged' in the traditional learning process (Genrich, Roberts, Cater-Steel, Low, 2004). Technologies which are already popular within the student population, such as mp3 players, are starting to gain momentum within education (Campbell, 2005). Since the inception of the podcast in 1994, a number of universities worldwide have introduced podcasts as potential learning and teaching tools. In Australia, Charles Sturt University is using podcasting to alleviate on-campus students' preconceptions and anxiety around lectures (Chan and Lee, 2005) as well as to enhance distance education students' integration into the learning environment (Lee and Chan, 2007). Lecturers at the RMIT School of Medical Sciences have used podcasts of lectures to give students an opportunity to review lecture content or listen to a lecture they may have missed (Laing, Wootton, and Irons, 2006).

Podcasting is a means of delivering multimedia content in an easy and direct manner (Campbell, 2005). Podcasting allows users to subscribe to a feed to automatically download new files as they become available. There is normally no cost associated in subscribing to a Podcast, which once downloaded can be played directly on the computer through a program such as Apple's iTunes. The format of a Podcast allows for easy download from a computer to an Mp3 player such as an iPod (Abram, 2006).

Podcasting is well situated to provide self-paced, 'anywhere-anytime' learning, and is well-matched to current students (Philpot, 2006). The tendency for students to be more independent learners and an increasingly diverse student population, has brought call for technology such as podcasting to be introduced into higher education (Taylor and Eustis, 2005). The current generation of university students appear to be more technologically minded, with fast uptake of mobile phones and Mp3 players (Huntley, 2006). Educators are now looking to this technology to meet this generation of students half-way (Lee, 2005).

Podcasting is a technology that falls into the category of what educators are describing as eLearning 2.0 (Downes, 2005). These eLearning 2.0 technologies result from the phenomenal growth of online learning and emerging technologies and includes technologies such as podcasting, blogs, and Wikis to name a few. The defining characteristic of eLearning 2.0 technologies is the ability of the learner to create content, collaborate, and take advantage of a variety of sources of content for learning. This ability of the student to take advantage of many sources of content meshes with the constructivist theory of learning that promotes the concept of learners constructing their own knowledge from a variety of teacher-supported learning options ( Bednar, Cunningham, Duffy, and Perry, 1995). This self-directed theory of learning seems to fit today's mobile, independent student, and podcasting becomes another way for these students to initiate their own learning.

Chan and Lee (2005) in their exploration of podcasting to alleviate pre-class anxiety amongst undergraduate information technology students, found that podcasting combined the strengths of audio learning and 'anywhere anytime learning'. Abram (2006) explained the success of podcasting as a learning tool as related to the alignment of teaching and learning methods to student's natural behaviours rather than forcing unknown technologies or methods onto them. Genrich, Roberts, Cater-Steel, Low (2004) stated that part of a successful strategy to target university students would use mobile and internet technology familiar to this cohort.

## The study

The investigation into the perceived effectiveness of podcasting as an enhancement to the current learning experience was conducted using a web-based quantitative survey. A quantitative survey style was chosen over qualitative methods such as interviews, because, although the data collected using qualitative approaches, such as interviews, would have been very rich, it was considered more important to capture the perceptions of a larger sample audience. A web-based survey is more anonymous and less threatening to students. In addition, the cultural diversity of students within the course may have made communicating effectively in an interview situation difficult.

Students were advised about the project in July 2006, during the first lecture of an information systems course. Students, comprised of both undergraduate and postgraduate levels, received access to a regularly updated podcast each week throughout the semester. These podcasts included discussions of key concepts from each lecture, using 'bite-sized' episodes ranging between 5 and 10 minutes in length. Students were expected to use the podcast to re-visit weeks they were less comfortable with or for general revision and exam preparation.

During mid-semester, September 2006, each of the 44 students enrolled in the course received an email with an invitation to complete a web-based survey about the podcast that had been made available. The survey was comprised of a number of demographic questions as well as closed likert style questions. One open-ended question was included at the end of the survey. A total of 41 students completed the survey. The results from this survey were measured and discussed against the questions below:

- 1 Do students use educational podcasts if they're made available to them?
- 2 Do students feel that the podcast assisted them in learning the content for the unit?
- 3 Do students feel that podcasting can enhance their educational experience within university education?
- 4 How do demographics such as gender, ethnicity and age affect the perceptions of students toward podcasting as enhancement of their educational experience?

Closed survey questions were analysed using frequencies and descriptive statistics to determine the level to which the respondents perceived the technology as helpful in their studies in the unit. Results were analysed to determine correlations that may have existed between respondent demographics and survey responses.

## Results

This section presents the results of the data in response to the questions presented above. For purposes of brevity, only the closed questions and demographics from the survey are discussed in this article. For each question, relevant statistical data is presented. When describing the statistical evidence, percentages are rounded to the nearest whole number.

### Use of educational podcasts

Respondents were asked if they used the podcast episodes provided to them as part of the Business Information Systems course. 'Using the podcast' is defined as either subscribing to the podcast through a program such as iTunes, or listening to podcasts directly from the website. Respondents were also asked to rate ease of use. The second part of the question queried how the podcast was used by the respondents, whether the podcast was downloaded to a portable player, such as an iPod. The availability of these devices to students was also explored.

Of the 41 respondents, 98% used the podcast made available to them. This implies a high degree of interest in the content and/or the technology.

To determine how respondents used the podcast, a question regarding perceived ease in accessing the podcast was asked, to which 88% of respondents agreed or strongly agreed that the podcast was easy to access. Table 1 below illustrates that the survey response to this question shows a difference in how strongly respondents agreed with the statement. Only a small number of students disagreed that accessing the podcast was easy.

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
Accessing the podcast was easy	5	0	7	54	34

**Table 1** Percentage of respondents—ease of access

Table 2 below indicates that of 41 respondents, 66% had access to a portable player or PDA device or both. Only 31% of students did not have access to any sort of portable player.

	<b>Percent</b>
Has access to PDA	15
Has access to portable MP3 player	46
Has Both PDA and MP3 device	5
Has neither	34

**Table 2** Access to a portable player

How students used the podcast once they gained access was also queried. When asked if they synchronised the podcast to a portable player 34% reported that they did, while 66% of respondents did not. This indicates a gap between those owning an MP3 compatible device and those choosing to use this device for the unit podcast.

### **Perceptions of podcasting as a learning tool**

The data collected in this section establishes how the respondents perceived the podcast assisted them in learning the content for Business Information Systems. In addition, respondents were asked about their attitudes about the future use of podcasting within the university.

Table 3 shows responses to whether respondents believed lecture material was easier to understand due to the podcast episodes, if respondents perceive the podcast episodes assisted them in understanding course material, as well as how respondents felt about viewing the lecture material in their own time using the podcast. The data shows that most respondents (90%) agreed that lecture material understanding was increased. In total, 88% of respondents agreed that the podcast assisted them in their understanding of course material. When queried about their comfort in viewing lecture material in their own time using the podcast, 94% of respondents agreed.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The lecture material is easier to understand due to the podcast	2	0	7	46	44
The podcast assisted me in understanding material the course material for CP571	2	0	10	54	34
I feel more comfortable listening to lecture related material in my own time using the podcast	2	2	5	42	49

**Table 3** Perceptions of assistance and comfort by percent

Table 4 below reports results from the survey relating to whether respondents believed podcasting has a future within university as a teaching and learning tool and if they would like to see other courses at the university offer podcasts. Most respondents (95%) agreed that podcasting has a future within the university as a learning and teaching tool. Respondents also agree strongly (90%) that they would like to see other courses at the university utilize podcasts.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel podcasting has a future within the university as a teaching and learning tool	2	0	2	37	59
I would like to see other courses at the university offer a similar podcast	2	0	7	37	54

**Table 4** Future as a teaching and learning tool—by percent

### Enhancing students' educational experience

The aim of the next three questions was to determine respondents perceptions regarding the ability of the podcast to enhance their educational experience. To 'enhance education' is quite subjective and it is reasonably difficult to present evidence to support this claim. The questions in the survey are designed to indicate whether respondents felt the podcast had appropriate content, integrated well with course material and whether they felt it was an enjoyable way to learn.

Table 5 below shows that a total of 87% of respondents either agreed or strongly agreed that the podcast had appropriate content. Most respondents (93%) perceived that the podcast

integrated well with the existing material in the course. Finally, respondents were asked if they found the podcast an enjoyable way to learn course material. Again, 93% agreed that they enjoyed learning this way.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The podcast had appropriate content	2	0	10	63	24
The podcast integrated well with existing unit material	2	0	5	54	39
Listening to the podcast was an enjoyable way to learn more about CP571	2	0	5	49	44

**Table 5** Percentage of respondents who perceived the podcast had appropriate content

### Impact of demographics on student perceptions

The survey began with demographic questions to enable a profile of survey respondents to be developed. These questions were asked in order to establish whether there is any relationship between the perceptions of respondents toward podcasting and any of the demographic groups. Table 6 below shows a summary of respondent demographics.

<b>Age</b>	25 or under	76
	Over 25	24
<b>Gender</b>	Female	27
	Male	73
<b>First Language</b>	English	37
	Other	63
<b>Origin</b>	Domestic	22
	International	78

**Table 6** Demographics of Respondents by percent

The four demographic groups were tested to establish any possible relationships between these groups and the responses on the nine perception questions in the survey. A number of statistical tests including Chi-Square testing, Fishers’s exact tests and Mann-Whitney tests were completed on the demographic variables. No verifiable significant associations could be found between any demographic variables and the nine perception questions in the survey. For the sake of brevity, the results of these tests will not be presented in this paper.

## Summary of results

This study explored the perceptions of university students toward podcasting as a teaching and learning tool, and whether these perceptions were affected by demographics such as age, gender, origin and English speaking background. Some of these perceptions included whether the podcasts assisted in learning course content, whether the podcasts were easy to use and whether learning course material through the podcasts was enjoyable. The level of participation from the potential survey population was high, and most respondents used the podcast. Respondents who used the podcasts were positive about the enhancement of their learning in the course as well as the future applicability of podcasting in learning course content.

The results of this study indicate that the demographics selected for this study do not appear to be associated with the overall perceptions of the podcasts. An analysis of both individual survey questions and overall perceptions found no difference in the way respondents answered questions based on demographics. This result may be impacted by the small sample size used for this study, as well as the survey population being restricted to one course within the university.

## Discussion

### Introduction

The purpose of this study was to investigate the perceptions of university students regarding podcasting as a teaching and learning tool. A convenience sample of undergraduate and postgraduate level students enrolled in an introductory information systems course were surveyed about the educational podcasts they had received that semester. This exploratory study used a self report survey to collect quantitative data. This section presents a summary of results and discussion of findings for each research question along with relevant literature in that area. The final section of this paper includes limitations of the study, suggestions for future research, and concluding remarks.

### Student's use of the educational podcast

This research question aimed to determine whether university students would use educational podcasts if they were made available to them. This question also explores how students would use the podcast. As shown in Table 1, 98% of respondents accessed the podcast, indicating that most students would access an educational podcast if one was made available to them. In addition, 88% of respondents agreed or strongly agreed that accessing the podcast was easy. Interestingly the findings also show that many students who had access to a portable player did not synchronise the podcast to their portable player.

The research on podcasting as a teaching and learning tool is still in the early stages. However, the relevant literature suggests that podcasting had been positively received and that further research is warranted into its use as a teaching and learning tool within universities. Several studies are currently in place to study the impact, advantages and pedagogies of podcasting within higher education, including a large, multi-university project in the United Kingdom (Beyond Distance Research Alliance, 2007). Studies at Duke University (Earp et al., 2006), found that university students accessed an educational podcast offered as part of the Duke Digital Initiative, and research by Chan and Lee (2005) at an Australian university found over 95% of university students indicated that they would access an educational podcast if they were given the opportunity. The results of this study parallel these views and other literature, that in a university setting students readily accessed and used educational podcasts when they were given the opportunity.

The results of the study indicate that respondents found accessing the podcast easy and that most respondents already owned a PDA or mobile MP3 player device which could be used to play the podcast. It should be noted that even though most respondents had a mobile device, many chose not to use this device to listen to the podcasts. This indicates that although many students would view the podcast on their PC, they may not also choose to use their mobile device for listening. Lee (2005) stated that by leveraging familiar technology it is possible to further the cause of learning and create mobile-learning. The results of the study do not indicate exactly why students did not all use their device for mobile learning. Some possible reasons could be that students had technical difficulties, or perhaps students did not perceive podcasting was a suitable avenue for mobile learning. As it is unclear, this may be an area which should be investigated in future research.

Overall the results suggested that university students would use educational podcasts if they were given the opportunity, and that students would probably find accessing that podcast easy. The results showed that most university students have access to a mobile device to allow for mobile learning but some may not necessarily take the opportunity to utilise this device for that purpose.

### Perception of learning assistance from podcasts

This research question aims to determine whether university students perceive that the podcast assisted them in learning course content. Part of that aim was to explore whether students felt more comfortable viewing course material in their own time. The research question also attempted to determine whether students believed that educational podcasting has a future within the university in general and whether students would like to see educational podcasts being offered within other courses at the university.

The results indicated that a majority of respondents agreed that podcasts assisted them in learning course content. The results also indicated that students perceived that the podcast assisted them in understanding lecture material. Student views regarding the future of podcasting as a teaching and learning tool at the university was found to be positive. As shown in Table 4, most respondents believed that podcasting has a future at the university and would like to see podcasting offered in other courses at the university. Overall the responses from the survey indicated that respondents perceived that the podcasts assisted them to learn the course content and understand lecture material.

The research on mobile and internet technologies as teaching and learning tools is still in the early stages. However, literature reviewed did suggest that technologies which are familiar to university students such as podcasting may be well received as teaching and learning tools. A number of studies have found students receptive to the idea of podcasting as a learning tool (Chan and Lee, 2005; Duke, 2004; Earp, Belanger, O'Brien, 2006). Further investigation using a variety of learning strategies with podcasting will further illuminate student interest and outcomes when using this technology for learning.

The findings of this study indicated that university students perceived that podcasting assists them to learn course content and understand lecture material. The present findings are consistent with those by Glenn (2003) who also found that technologies gave students more freedom over the learning environment would be well received by students. According to Glenn (2003) podcasting was likely to have been well received by students because of the apparent increased control over the learning environment and findings here are consistent with that.

The results of the present study support the findings in research from Genrich et al. (2004). The study (Genrich et al., 2004) used a strategy to target current student learning behaviours using mobile and internet technologies which were familiar to students. The present study built on this research by using familiar technology, and the results suggest that students did



perceive that podcasting helped them to understand course content and lectures. The present study also found that students believed podcasting has a future as a teaching and learning tool and that most would like to see podcasting offered in other units. This is related to the findings of Taylor and Eustis (2002) which stated the use of technology may remedy the learning needs of an increasingly diverse student population. The results of the present study support views of Taylor and Eustis (2002) that indicated that by using technology to advance the teaching and learning methods offered by the university it may better meet the learning preferences and expectations of students.

The results of the study may indicate that university students are able to learn more effectively through the use of a podcasting which supplements the traditional methods already offered by universities. Future research that includes pre and post measures of academic achievement together with a control group would increase confidence that the inclusion of podcasting as a teaching and learning tool aids overall enhancement of learning.

### Perceptions of enhanced learning from podcasts

This question explored whether students perceived the podcasts enhanced their educational experience. Although it is difficult to measure student's perception that the podcast 'enhances' their education, three areas were measured to provide evidence which may support an answer this question. These include whether students perceived the podcast had appropriate content, integrated well with existing course material and was an enjoyable way to learn.

The results of the present study indicated that students perceived that the podcast had appropriate content. As shown in Table 5, 88% of respondents agreed or strongly agreed that the podcasts had appropriate content. The results show that 93% of respondents agreed or strongly agreed that the podcasts integrated well with existing course material. Table 5 also shows that students found the podcast an enjoyable way to learn course material, as 93% of respondent agreed or strongly agreed with the statement.

In summary, the results suggest that students perceived that the podcasts had appropriate content, which integrated well with existing unit material, and was an enjoyable way to learn about the course. Overall these results indicate that students reacted positively to podcasting as an enhancement to their learning.

Although the present study did not include a control group, or pre and post measures of academic performance, by self report, the majority of respondents indicated the podcast enhanced their educational experience. These findings are consistent with earlier research at Duke University which also found their educational podcasts were perceived to be helpful by students (Duke, 2004). Research by Walker et al. (2006) found resistance to the notion of web-based learning replacing traditional teaching and learning methods (Walker et al., 2006). This literature may suggest that the present study was successful because it did not remove the existing teaching and learning methods. Further to this, the results are indicative that university students overall perceived the podcasts to be valuable learning aids.

The respondents in this study have indicated that the podcasts they received as part of an information systems course were seen as valuable tools in learning the unit content and understanding lectures. This evidence suggests that by introducing similar podcasts into other courses these podcasts may also be perceived positively by students and may enhance learning.

### Respondent demographics and the potential impact on perceptions

This question considered the degree to which specific demographics were associated with perceptions of the educational podcasts. The results of this study indicate that none of the

demographics selected for this study appear to be associated with any of the nine perception questions asked in the survey. This was demonstrated using a non-parametric test which found no overall association between the demographics and how the respondents answered the questions. This was also demonstrated through the Chi-square and Fisher's exact tests on individual survey questions which did not find any significant relationships.

The overall percentage of students from each generation reflected the balance shown in the literature. However, this study differed from the literature, which found the majority of current university students under 25 indicated they communicated differently to previous generations, and that males preferred internet communication over females ((Genrich et al. 2004; Wolburg and Pokrywczynski, 2001). The current study contradicted these findings as there was no significant difference found in how students perceived the podcast, based on either the generation or gender of the student. The small size of the respondent pool may be influencing these findings however. Replication of this study using a larger university population would be necessary to verify this result.

A study by Harman (2004) states that there were increasing numbers of international students studying at Australian universities. In this study 73% of responders were international students and 63% did not use English as their first language. The results of this study did not find the students origin or their language background negatively impacting their perceptions of the podcast. In fact, comments from international respondents indicated that the podcasts were especially helpful for revisiting the lecture material and adding to notes for the class.

As an exploratory study, there was not a large sample size for this research. The lack of findings in relation to significance between the perceptions of the podcasts and the demographic groups may be due to this small sample size. A larger sample size may provide further evidence as to whether there is any relationship between student demographics and perceptions of podcasting as a teaching and learning tool.

### Limitations of study and future research

One of the major limitations recognised for this study was the use of self-administered surveys. It is acknowledged that there are certain difficulties associated with the use of self-administered surveys, such as the lack of control by the researcher in the environment where the respondent completes the survey. Respondents were encouraged to complete the surveys by using a relatively short survey. It is also recognized that a major limitation of the study was the size of the sample population which may mean the results do not necessarily generalise to all Australian university students. For example, this particular cohort may be more technically adept than students studying other disciplines.

Future research across a broader range of courses using a larger sample size may increase confidence that podcasting would be perceived as helpful by all university students. Further research should aim to determine the hourly commitments students have outside university contact hours. This may provide an association between receptiveness to mobile learning and student time demands. Further research may also attempt to link the use of podcasting in courses to student's academic performance using pre and post measures of student academic results in the course. Further research designed to examine whether successful use of podcasting in learning and teaching results from the content of the podcast or the technology used is seen as critical.

A critical area future research is the establishment of a link between theories of learning, the development of teaching models, and technologies such as podcasting. Larger studies, such as IMPALA, can develop a considered direction for this and other technology tools to create the greatest possible impact on student learning.

## **Conclusion**

The results of this preliminary study informs the researchers as well as the field of practise regarding the use of podcasting in an educational environment. Methods of podcasting as well as the perceptions of students regarding the ease of use and benefits of this technology will allow for the development of curriculum around the concept of podcasting as a viable and valuable learning and teaching tool. Further studies into the use of podcasting in different areas of study other than information systems, as well as best practise models for the university are being considered since the conclusion of this first study.

The evidence from the present study indicated that university students perceive podcasting positively as an educational teaching and learning tool. After receiving the podcast for the first seven weeks of the semester, students stated they were able to learn course content and understand lecture material more easily. This suggests that university students would view podcasting as a valuable addition to traditional teaching and learning methods. This use of additional learning tools is supported within constructivist learning theory.

This study endeavoured to find a relationship between the perception of the podcast and demographics such as age, gender, origin and language background. It was expected that student perceptions would differ based on their demographics such as their generation. However, the results of the analysis did not confirm any association. From this study, it is clear that further research with a larger cohort is required to identify whether there is an association between student perceptions of podcasting and demographic groups.

The findings of this research indicate that this group of university students perceived that educational podcasting has a future within university education. The findings indicated that these university students would react positively to the introduction of podcasting into other university courses, and that podcasting may assist to meet the learning preferences and expectations of this diverse student cohort. These results, coupled with other areas within the e-learning 2.0 spectrum can contribute to higher education learning and teaching by enabling students to construct content that assists their learning from a variety of sources, of which podcasting is just one. Further studies into this area can assist in the production of useful, viable learning tools for students, backed by the development of sound educational theory surrounding these tools.

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