Podcasting in Education: Student Attitudes, Behaviour and Self-Efficacy

Andrea Chester, Andrew Buntine, Kathryn Hammond and Lyn Atkinson

RMIT University, GPO Box 2476, Melbourne, Victoria 3001, Australia // andrea.chester@rmit.edu.au // andrew.buntine@rmit.edu.au // kathryn.hammond@student.rmit.edu.au // lyn.atkinson@rmit.edu.au

ABSTRACT
The aim of the present study was to describe the characteristics of podcast users, compare uptake across courses, examine preferred modes of use and satisfaction, assess the impact of podcasts on lecture attendance, and evaluate reasons for use and non-use. Participants were 273 undergraduate students enrolled in six diverse courses at a large Australian university. Results suggested differences in uptake and satisfaction across courses, with later year students more satisfied than first year students. Although podcast users were older, worked longer hours in paid employment, and attended fewer lectures than those who did not use podcasts, results also suggest that users had more contact with staff and reported higher levels of academic self-efficacy than non-users. Suggestions for improvements to current podcasting provisions are offered and directions for future research are provided. In particular the need to tap into the use of podcasts for examination revision is highlighted.

Keywords
Podcast, Self-efficacy, Students, Attitudes, Behaviour

Many universities now routinely offer web-based lecture recordings or podcasts. Although recording material for students is not new to education, growing attention has been given to podcasting in the last decade with technological changes that make producing and accessing lecture recordings increasingly easy. The issue occupies a growing slice of the educational literature, with both theoretical and empirical articles on the topic. As Harris and Park (2008) note, educational podcasts can serve a range of purposes from augmenting teaching through to recruiting new students, providing tours of the university, and offering pastoral care. Research has tended to focus on the first of these and within this category studies have examined student behaviour and perceptions of podcasting, the impact of podcasting on student learning, and staff responses. Although these three areas are interrelated, this article focuses on the first: student use and attitudes.

Studies of student use and attitudes towards podcasting began to appear in the literature in 2006 and a picture of student behaviour and satisfaction is beginning to emerge. Generalising from this research, however, needs to be conducted with some caution as studies vary on a range of dimensions including the ways in which podcasts have been incorporated into courses, disciplines examined, size of courses and response rates, the time of semester at which the surveys were conducted, and the methods (paper versus online) of survey administration.

Podcasts have been incorporated into the curriculum in a variety ways to meet a range of learning objectives. The most commonly reported use of podcasts involves recording of face-to-face lectures (e.g., Gosper, McNeill, Woo, Phillips, Preston, & Green, 2007; Lighthbody. McCullagh, Hughes, & Hutchison, 2007; McElroy & Blount, 2006; McKenzie, 2008; Maag, 2006; van Zanten, 2008; Williams & Fardon, 2007). Other researchers have reported using podcasts to record tutorials (Tynan & Colbran, 2006) and deliver short recordings or “episodes” of core (Clark, Taylor, & Westcott, 2007; Laing & Wootton, 2007) or supplementary material (Bell, Cockburn, Wingkivist, & Green, 2007). Podcasts have also been used to provide glossaries of key terms (Lightbody et al., 2007) and as a feedback mechanism for lecturers to communicate with individuals and groups on assessment tasks (Maag, 2006; McGregor, Merchant, & Butler, 2008). A smaller number of studies have examined the use of student-generated podcasts (Petrovic, Kennedy, Chang, & Waycott, 2008).

Irrespective of the form of podcasting, student satisfaction is typically strong and students generally perceive podcasts to have enhanced their learning (Goldberg & McKhann, 2000; Maag, 2006; Soong, Chan, Cheers, & Hu, 2006). For example, in a large Australian study involving four universities, 80% of students indicated that podcasts made it easier for them to learn and two-thirds noted that the recordings helped them achieve better results (Gosper et al., 2007). In smaller studies, podcasts have been rated as an important component of the course (McElroy & Blount, 2006) and as more crucial to the learning experience than attending lectures (McKenzie, 2008). Whether podcasts actually facilitate learning and/or help students achieve better grades is, however, unclear. Assessing the impact of podcasting on learning outcomes is complex given the inherent difficulties in determining the influence of any single variable on the process of learning as well as the logistical and ethical issues involved in experimental research in
this area. Nevertheless, quasi-experimental research comparing naturally occurring groups of podcast users and non-users may yield some useful information.

Research on student use and satisfaction of podcasts has included a range of disciplines, most typically with a focus on the sciences, including health sciences, as well as business. Disciplines include: computer science, (Bell et al., 2007; Laing & Wootton, 2007; Lightbody et al., 2007; Ogawa & Nickles, 2007), information systems (Janossy, 2007; Laing & Wootton, 2007), marine science (Copley, 2007), medical science (Laing & Wootton, 2007), medicine (Petrovic et al., 2008), nursing (Maag, 2006), psychology (McKenzie, 2008), law (Tynan & Colbran, 2006), accounting (McElroy & Blount, 2006), economics (Clark et al., 2007), and marketing (van Zanten, 2008). Few studies to date have examined differences in uptake or satisfaction between these courses.

Sample size also varies considerably between studies, with an institution-wide study at the University of Western Australia reporting the largest sample of more than 1000 students (Williams & Fardon, 2007) through to relatively small cohorts of less than 50 in studies of a single course (e.g., Lightbody et al., 2007). Similarly response rates differ, with a high of 90% noted by Janossy (2007) in his survey of 83 Information Systems students and a low response rate of 16% reported in the large cross-institutional study of Gosper et al. (2007). The majority of studies list response rates around 30-40%, although unfortunately this information is not always reported.

A further way in which studies differ and a variable that may impact on response rate is the method by which surveys have been administered. Surveys of student attitudes typically use questionnaires administered in lectures or online versions. In some cases (e.g., McKenzie, 2007) both paper and online versions have been used. Although online administration of questionnaires amongst students is often associated with poor response rates (Johnson, 2002), in research on podcasting, an online version of the questionnaire makes good sense. Active podcast users may not attend lectures. Questionnaires administered in class may therefore include a skewed sample. Despite this, some studies have only used paper-based surveys conducted in class (e.g., McElroy & Blount, 2006).

Nearly all studies of student attitudes include self-reported use of podcasts. Typically more than 50% of students report using podcasts. For example, Clark et al. (2007) reported 63% use amongst economics students and McElroy and Blount (2007) recorded 79% of the 400 accounting students in their sample using the weekly podcasts. Students report a range of reasons for using podcasts including picking up missing information, revisiting complex material, working through material at one’s own pace, and catching up on a lecture that was missed. Examination revision, however, is typically the most frequently reported reason for using podcasts (Copley, 2007; Gosper et al., 2007; Janossy, 2007; Laing & Wootton, 2007; Williams & Fardon, 2007). Analyses of hit rates support this, revealing an increase in use of recordings in the week prior to examinations (Copley, 2007; Lightbody et al., 2007). The time in semester when students are surveyed is therefore likely to impact on students’ reported use. Surveys conducted at the end of semester before examinations may underestimate actual use as some students may not take advantage of podcasts until they begin studying for examinations.

Most of the studies of student attitudes towards podcasts have been descriptive, building up the picture presented above of the proportion of students using podcasts, their reasons for use, and satisfaction with them. In addition, a number of other variables have been proposed as potentially important in understanding podcast use and satisfaction, including learning styles (Gosper et al., 2007; McKenzie, 2008), non-English speaking background (Copley, 2007; Gosper et al., 2007), impact of delivery mode e.g., external or distance (van Zanten, 2008).

Another variable sometimes thought to impact on podcast use is age. Given suggestions of age-related differences in educational expectations (Oblinger & Oblinger, 2005) and descriptions of Gen Y as “digital natives”, the impact of age on podcasting has been examined. Do younger students have more positive attitudes to podcasting than older students? Research supports few age-related differences. For example, in their large Australian study, Gosper et al. (2007) reported only two age-related differences. Older students were more likely to use podcasts to work through material at their own pace and were less likely than younger students to use the podcasts because the lecturer did not speak clearly. Research on students’ mp3 player use to access lecture recordings, reported no age-related differences (Williams & Fardon, 2007). The failure to find widespread age differences in podcasting attitudes may be explained by emerging research challenging the “digital native” description of young students. Kennedy et al. (2007) noted considerable variation in technology uptake amongst the 2588 first year students surveyed. They conclude “we must be wary of overgeneralising the distinctive features of this generation, as individuals or as a group, their lifestyles or their learning styles based on assumptions about technology use or preferences” (p.522). As a result caution is suggested in assuming young students will be proficient and confident accessing podcasts.
One variable that does not appear to have been examined to date is academic self-efficacy. Academic self-efficacy is a student’s judgment of their ability to perform the actions required for success. Students with higher academic self-efficacy would be expected to put more effort into tasks and be more persistent in their academic pursuits (Sander & Sanders, 2006). Academic self-efficacy predicts academic performance (Elias & MacDonald, 2007; Lent, Brown, & Gore, 1997) and is negatively related to anxiety (Saks, 1994). It is unclear how academic self-efficacy might be related to lecture recording use, but understanding the relationship offers potential insight into the kinds of students who use lecture recordings.

The impact of podcasting on lecture attendance has been examined. Much has been made in the literature about the potential decline in lecture attendance if podcasts are introduced; a concern often raised by staff (Buxton, Jackson, deZwart, Webster, & Lindsay, 2006; Chang, 2007; Phillips, McNeill, Gosper, Woo, Preston, & Green, 2007). Williams and Fardon (2007) reported a perceived decrease in lecture attendance amongst more than 50% of lecturers using recordings. Similarly just over half the lecturers in a study by Phillips et al. (2004) noted that student attendance had decreased following the introduction of lecture recordings. Research using student self-reports tells a different story however. Several studies have failed to note a self-reported reduction in face-to-face attendance (Copley, 2007; Maag, 2006; Mayer, 2006). Further, Williams and Fardon (2007) concluded that those students who used lecture recordings regularly were those most likely to report regular lecture attendance. Although it might be unsurprising to hear that students continue to attend lectures when audio only recordings are available, it is of note that these findings have also been reported for recordings with video content.

One way to resolve the problem of relying on either staff perceptions or student self-reports is to conduct headcounts. Headcounts are not common in the literature, but McElroy and Blount (2006) reported that lecture attendance remained consistently high despite the introduction of podcasts, so presumably headcounts were conducted. McKenzie (2008) had lecturers conduct headcounts in end of semester classes to assess actual attendance and noted that the 28% attendance rate accorded with the 30% of students who said they attended all lectures. Although it not clear to what extent the attendance rate can be attributed to the availability of podcasts, it is of note that the most frequent reason cited for using the audio recordings in this study was “to catch up on a missed lecture”. While there is little support for the idea that podcasts will reduce lecture attendance. There is, however, a shortage of objective data in this area.

In summary, many universities now routinely offer web-based lecture recordings – or podcasts – and the practice is becoming well-represented in the educational literature. Research tends to focus on the use of podcasts to augment classroom teaching. Students generally perceive podcasts to have enhanced their learning, and consider the recordings as more crucial to the learning experience than attending lectures. Whether podcasts actually facilitate learning and/or help students achieve better grades is, however, unclear. Given students’ use of podcasts for examination revision, the time in semester when students are surveyed is therefore likely to impact on students’ reported use. Surveys conducted at the end of semester before examinations may underestimate actual use as some students may not take advantage of podcasts until they begin studying for examinations.

The impact of podcasting on lecture attendance has been examined, and is a concern often raised by academic staff. Research using student self-reports tells a different story, however – those students who used lecture recordings regularly were those most likely to report regular lecture attendance. One way to resolve the problem of relying on either staff perceptions or student self-reports is to conduct headcounts.

A number of variables have been proposed as potentially important in understanding podcast use and satisfaction, including learning styles, non-English speaking background, impact of delivery mode and age. One variable that does not appear to have been examined to date is academic self-efficacy. Understanding the relationship between academic self-efficacy and the use of augmentative resources (such as lecture recordings) may offer potential insight into student preferences and outcomes.

**Purpose**

The current research was undertaken in the first year of the full implementation of Lectopia at RMIT University. This research was part of a larger study examining both staff and student responses to the university-wide initiative. Only student attitudes and use are reported here.
Lectopia was made available in a range of large lecture theatres, providing audio and screen capture. The system operated under an ‘opt-in’ model, with individual lecturers indicating their intention to record lectures (and preferences for individual elements: audio, screen-capture, etc) via an online booking form. Recording was then triggered automatically for the duration of the class, as per the University timetable system. Download and streaming options enabled access to the recordings on demand within a few hours of the face-to-face lecture.

Research aims

The aims of the research were to:
- compare podcast users and non-users by demographic variables, as well as course and year level;
- assess student satisfaction with podcasts;
- compare the academic behaviour and academic self-efficacy of podcast users and non-users;
- examine preferred modes of podcast use; and,
- evaluate reasons for podcast use and non-use.

Method

Participants

The total number of respondents to the first survey, conducted during semester, was 288 (169 female, 118 male, 1 unidentified), representing a response rate of 43.24%. Mean age was 21.7 years ($SD=4.61$), although considerable variability was noted across disciplines, with one first-year course reporting a mean age of 20.01 ($SD=3.90$) and one third-year course a mean of 27.88 ($SD=7.73$). The majority of students (78.8%) spoke English as a first language and studied full-time (95.5%). The students worked, on average, 12 hours a week ($SD=10.24$). Participation in the second survey, conducted following the examination period, was lower than the first, with a total of 81 (44 female, 37 male) respondents, representing a response rate of 12.16%. Demographic characteristics were similar to the first survey.

Measures

The two surveys developed for this study used a range of items from previous research (e.g., Clark et al., 2007; Gosper et al., 2007; McElroy & Blount, 2006). The first questionnaire included 26 scale response and open-ended questions covering demographic details, (age, sex, English as a first language), lecture attendance, academic staff contact, knowledge and use of lecture recordings, reasons for using lecture recordings or choosing not to use the lecture recordings, details of where, how and how often recordings were accessed, intention to use lecture recordings for examination revision, and two questions about the perceived usefulness of Lectopia in the specific course and in general. Also included was the Academic Behavioural Confidence Scale (ABC; Sander and Sanders, 2006). This 24-item scale measures academic self-efficacy in six areas: studying, grade achievement, attendance, clarification, understanding, and verbalising. Responses are completed on a five-point Likert scale, from very confident to not at all confident. The scale has adequate psychometric properties and a total ABC score has been used to distinguish between different student groups (Sander & Sanders, 2006). The internal reliability of the ABC in the present study was good; Cronbach’s $\alpha = .92$.

The second questionnaire consisted of 20 questions, focusing on the use of lecture recordings for examination revision. Eleven questions from the first questionnaire were repeated in the second questionnaire, including demographic questions, and reasons for using or choosing not to use lecture recordings. In addition, questions assessed the number of lectures attended, number of recordings accessed for examination revision, perceived usefulness of lecture recordings for examination revision, and grade attained.

Procedure

A global email was sent to all course coordinators who were registered to use Lectopia inviting them to participate and a sample of those who volunteered were selected to represent the major campuses of the University, different years of undergraduate study, and all three Colleges: Business; Design and Social Context; and Science, Engineering
and Health. Participants were recruited from 7 undergraduate courses in which lecture recordings were provided via Lectopia. Due to a low response rate (7.59%) to the first survey in one course, this course was removed from the analysis.

The first survey was administered in hard copy in class in Week 10. In addition an electronic version of the questionnaire was provided via the online learning management system for students who did not attend the lecture on that day. The second survey was administered after the examination period and was provided in electronic format only. The URL for the questionnaire was emailed to students. Headcounts were conducted by the experimenters in all courses at Weeks 4, 8 and 12.

Ethics approval for the study was granted by the university.

Results

A small number of missing values were noted. These cases were deleted on a listwise basis.

Comparison of podcast users and non-users by demographic variables, course and year level

Data on self-reported use of podcasts for each course is summarised in Table 1. Overall, 42% of students had used lecture recordings when surveyed during the semester. After completion of examinations, uptake had increased to 70%.

Students who accessed the lecture recordings were significantly older ($M$=22.34, $SD$ = 5.09) than students who did not access them ($M$=20.95, $SD$ = 3.96), $t$ = 2.51, df = 264, $p$ =.013, two-tailed. In addition the students who used lecture recordings worked longer hours ($M$=13.50, $SD$=10.85) than those who did not use the recordings ($M$=10.87, $SD$=9.76), $t$ =1.98, df = 242, $p$ =.049, two-tailed. Uptake was unrelated to sex or English as a first language. Courses varied significantly in student self-reported uptake of lecture recordings, from less than one-quarter of students in first year Psychology to 100% of students in Social Work, ($F$ (5,117)=2.63, $p$<.027). No differences were noted across year level.

<table>
<thead>
<tr>
<th>Course</th>
<th>Year</th>
<th>Total enrolled $n$</th>
<th>Sample$^a$ $n$</th>
<th>Response rate$^a$ %</th>
<th>Accessed podcasts (during semester) %</th>
<th>Accessed podcasts (for exam revision) %</th>
<th>Mean satisfaction$^b$ (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology 1</td>
<td>1</td>
<td>172</td>
<td>103</td>
<td>59.88</td>
<td>22.00</td>
<td>43.00</td>
<td>2.67 (1.55)</td>
</tr>
<tr>
<td>Marketing</td>
<td>1</td>
<td>166</td>
<td>41</td>
<td>24.70</td>
<td>56.10</td>
<td>66.45</td>
<td>3.62 (1.36)</td>
</tr>
<tr>
<td>Psychology 2</td>
<td>2</td>
<td>37</td>
<td>16</td>
<td>43.24</td>
<td>75.00</td>
<td>100</td>
<td>4.15 (1.21)</td>
</tr>
<tr>
<td>Software engineering</td>
<td>2</td>
<td>114</td>
<td>51</td>
<td>44.74</td>
<td>35.29</td>
<td>70.89</td>
<td>3.41 (1.56)</td>
</tr>
<tr>
<td>Chiropractic</td>
<td>3</td>
<td>104</td>
<td>43</td>
<td>41.35</td>
<td>51.16</td>
<td>86.67</td>
<td>3.71 (1.38)</td>
</tr>
<tr>
<td>Social work</td>
<td>3</td>
<td>73</td>
<td>17</td>
<td>23.29</td>
<td>100</td>
<td>66.33</td>
<td>4.29 (.92)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>666</td>
<td>288</td>
<td>43.24</td>
<td>42.00</td>
<td>70.02</td>
<td>3.49 (1.48)</td>
</tr>
</tbody>
</table>

$^a$ first survey $^b$ scored out of 5

Satisfaction with podcasts

Mean satisfaction with podcasts is presented in Table 1. No sex differences were noted in satisfaction. Although age was related to podcast use, age was not correlated with satisfaction with lecture recordings. Satisfaction was not related to English as a first language. In summary there was no relationship between demographic variables and podcast satisfaction. A moderate positive correlation was noted between Lectopia use and satisfaction ($r$=.357, $N$=118, $p$<.01), suggesting, not surprisingly that students who use the recording more frequently rate them more
highly than students who use them less. In addition, perceived satisfaction varied by course ($F(5,136)=4.43, p=.001$) with the highest rates of satisfaction reported in the Social Work course and the lowest noted in first year Psychology. Year level was also related to satisfaction, with second and third year students rating the recordings more useful than first year students ($F(2,139)=8.91, p<.001$).

**Academic behaviour and academic self-efficacy**

Students were also asked to estimate their lecture attendance. Nearly half the respondents (48.5%) reported that they attended weekly and another 32.5% reported attending most weeks. Only 5% of students reported never attending lectures. Headcounts, conducted three times during the semester (Figure 1), did not, however, support these self-reports, with attendance rates of around or below 50% noted in all courses by Week 8.

![Figure 1. Headcount as a percentage of number enrolled](image1)

A comparison of self-reported lecture attendance by podcast use is presented in Figure 2. Podcast users were less likely to attend lectures every week and more than twice as likely to report never attending lectures as non-users, however, few differences across the other attendance categories were evident. A chi-square analysis revealed no significant differences between podcast users and non-users on self-reported lecture attendance.

![Figure 2. Lecture attendance by podcast use](image2)

In order to explore level of engagement with staff amongst students using the podcasts, a composite score including face-to-face contact with staff, phone, email, and other online interaction, such as use of discussion boards, was calculated. This variable had a total possible score of 25. Contact with staff was higher for the Lectopia users ($M=11.55, SD=3.00$) compared to non-users ($M=10.35, SD=2.88$), $t(259)=3.27, p=.001$, two-tailed.
Students who used lecture recordings also scored significantly higher on academic self-efficacy than those who did not use the recordings (M=91.19, SD=12.58; M=87.21, SD=12.54), t(248)=2.48, p=.014, two-tailed (Table 2). Lectopia users scored higher that non-users on five of the six sub-scales of the academic self-efficacy measure, indicating greater confidence in their ability to study, understand, achieve good grades, verbalise and clarify compared to those students who did not access the lecture recordings. It is of note that the only area on which users did not demonstrate higher academic self-efficacy was class attendance.

<table>
<thead>
<tr>
<th>Academic self-efficacy subscale</th>
<th>Lectopia use</th>
<th>t</th>
<th>p</th>
<th>d</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Users (n = 121)</td>
<td>Non-users (n = 164)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achieve good grades</td>
<td>3.92 (.56)</td>
<td>3.76 (.58)</td>
<td>2.25</td>
<td>.025</td>
<td>0.27</td>
</tr>
<tr>
<td>Attending</td>
<td>4.01 (.69)</td>
<td>3.96 (.68)</td>
<td>.01</td>
<td>.546</td>
<td>0.07</td>
</tr>
<tr>
<td>Clarifying</td>
<td>3.89 (.61)</td>
<td>3.66 (.62)</td>
<td>2.99</td>
<td>.003</td>
<td>0.25</td>
</tr>
<tr>
<td>Studying</td>
<td>3.79 (.63)</td>
<td>3.59 (.62)</td>
<td>2.51</td>
<td>.013</td>
<td>0.32</td>
</tr>
<tr>
<td>Understanding</td>
<td>3.80 (.58)</td>
<td>3.63 (.63)</td>
<td>2.58</td>
<td>.010</td>
<td>0.28</td>
</tr>
<tr>
<td>Verbalising</td>
<td>3.46 (.83)</td>
<td>3.18 (.76)</td>
<td>2.87</td>
<td>.004</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Preferred modes of podcast use

With respect to primary mode of lecture recording access, the majority of students (88.71%) accessed recordings off campus. Although downloading was the most popular method of access, used by 66.95%, it is of note that one-third of students used one of the streaming options. A small proportion of students chose to replay the files on their mp3 player (15.64%) rather than on computer. Even though screen capture was available for all recordings, the audio only option was chosen by 35.77%. During the semester students were more likely to view the entire lecture (67.7%) than access specific segments (32.2%). Students used a similar technique when studying for examinations, although students were more likely to access a specific section (44.10%) at this stage than earlier in the semester. When asked, during semester, when they accessed the recordings, 32.38% of students said they did so the same week of the lecture, 19.69% the following week and 31.50% later in the semester.

Reasons for podcast use and non-use

Students who used the lecture recordings indicated their major reasons for doing so (Table 3). During semester students cited examination revision as the most frequent motivation for using the podcasts. More than half the students (54.9%) thought it was likely they would use the podcasts for examination revision (11% more than were using Lectopia during semester). The second questionnaire suggested this was an underestimation; 71.6% of respondents noted they had used the podcasts for examination preparation. Students reported using an average 6.6 out of 12 lecture recordings (SD=3.99) for examination revision.

<table>
<thead>
<tr>
<th>Table 3. Reasons for Using Podcasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason</td>
</tr>
<tr>
<td>To revise for exams</td>
</tr>
<tr>
<td>To revisit complex material, ideas and concepts</td>
</tr>
<tr>
<td>To work through the material at my own pace</td>
</tr>
<tr>
<td>Short-term illness preventing me attending</td>
</tr>
<tr>
<td>Work commitments keep me from attending</td>
</tr>
<tr>
<td>To better understand the language</td>
</tr>
<tr>
<td>Difficult to travel to attend lectures</td>
</tr>
<tr>
<td>Lecture clashes with another class</td>
</tr>
<tr>
<td>To hear administrative announcements</td>
</tr>
</tbody>
</table>
The 53% of students who had not used the lecture recordings noted their main reasons (Table 4). Of these students most did not think they needed the podcasts, but instead found attending the lectures sufficient for their learning. Nearly two-thirds of students were not sure how to access the podcasts and troublingly, a sizable group (44%) did not even know the podcasts existed. According to self-report, lack of computer access prevented only a small proportion of students using the podcasts.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>The face-to-face lectures are sufficient for my learning</td>
<td>81</td>
</tr>
<tr>
<td>I prefer face-to-face lectures to Lectopia recordings</td>
<td>58</td>
</tr>
<tr>
<td>I am unsure how to access the files</td>
<td>29</td>
</tr>
<tr>
<td>I was not aware the recordings existed</td>
<td>20</td>
</tr>
<tr>
<td>Files are unreliable in terms of quality</td>
<td>13</td>
</tr>
<tr>
<td>Do not have a computer to access the files</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 4. Reasons for Not Using Podcasts

In order to further explore non-users, the sample was split into three approximately equal groups on the basis of academic self-efficacy scores and reasons for non-use were compared across these three groups. Visual comparison of the groups shows that compared to students with moderate or high levels of academic self-efficacy, students with low academic self-efficacy were less likely to know how to access the podcasts and were most likely to report the files unreliable (Table 5).

<table>
<thead>
<tr>
<th>Reason</th>
<th>Low ASE (&lt;84)</th>
<th>Moderate ASE (84-92)</th>
<th>High ASE (&gt;92)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The face-to-face lectures are sufficient for my learning</td>
<td>26</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>I prefer face-to-face lectures to Lectopia recordings</td>
<td>16</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>I am unsure how to access the files</td>
<td>16</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>I was not aware the recordings existed</td>
<td>10</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Files are unreliable in terms of quality</td>
<td>11</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Do not have a computer to access the files</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 5. Reasons for not Using Podcasts by Academic Self-Efficacy Score (ASE)

Students were asked if they could request one change to the Lectopia system what it would be. In response 38% of students provided a comment. Six major themes emerged from these responses covering technical and pedagogical aspects: improvements to quality and reliability of the recordings (some lectures were not properly recorded and on some others lecturers did not wear the lapel microphone); decreased file size; chapterised recordings so the section of interest could more easily be located; the provision of clearer instructions for accessing recordings; including video of the lecturer, and extending the use of Lectopia to all lectures.

Discussion

Results of the present study suggest that both uptake and satisfaction with lecture recordings vary across courses, with satisfaction higher in later year courses than first year. Uptake was considerably lower when reported during the semester compared to self-report after examinations, confirming the use of lecture recordings for examination revision as a primary motivation. This finding is consistent with previous research (Copley, 2007; Gosper et al., 2007; Janossy, 2007; Laing & Wootton, 2007; Williams & Fardon, 2007), however, the low response rate to the survey conducted after the examination period means that this result should be interpreted with some caution.

Most demographic variables were unrelated to Lectopia use, including gender and English as a second language; however, age and hours of employment proved significant. Contrary to previous research older students were significantly more likely to report using podcasts than younger students. It is of note that 90% of respondents were
aged under 26, so many “older” students were still in the Generation Y age bracket. Nevertheless, just as Kennedy et al. (2007) cautioned against assuming that Gen Y students are technologically savvy, the results of the present study suggest that we also need to be careful not to assume the opposite of older students, who may in fact be keen to take advantage of learning and teaching innovation.

Hours of employment were related to use of podcasts and almost one-fifth of students noted that they used the podcasts because work commitments prevented them from attending face-to-face lectures. On the whole, however, podcasts did not appear to be used to replace lectures. Although podcast users were less likely to attend lectures every week than students who did not access the recordings, differences in self-reported lecture attendance between users and non-users were not significant and it is of note that the proportion of students who never attended lectures was low.

Despite debate about the value of lectures, they remain an integral part of learning and teaching in many disciplines. They can be useful, not just as a cost-effective means of delivering material, but for the role they play in helping lecturers quickly gauge understanding and for shaping communities of practice. Previous research has explored why students choose to attend lectures when podcasts were available. When asked this question students have emphasised a desire for “live” interaction and the value of being able to ask questions (Copley, 2007). Attending live lectures is also perceived by students to provide motivation and structure (Copley, 2007; McNeill, Woo, Gosper, Phillips, Preston, & Green, 2007). McNeill et al. (2007) concluded “We can surmise that lectures are important to many students’ learning and that if useful visual aids are provided and a stimulating and motivating environment is created, students will choose to come to lectures if possible” (p.5). Results from the present study support this conclusion. More than 50% of students in the present study chose not to use the podcasts, relying solely on the face-to-face lectures and even for the majority of those who used the podcasts, lecture attendance remained the primary mode for accessing course content, with podcasts used to supplement material. The request by students for video of the lecturer suggests that non-verbal aspects of lectures are perceived to be useful.

A small proportion of students who used the podcasts did not attend lectures. Whether Lectopia encouraged students to miss lectures or whether these were students unlikely to attend lectures anyway is unclear. If the latter is the case then it could be argued that the podcasts serve an important function, providing information for students who otherwise would have missed out. What is clear from the present study is that students overestimate their lecture attendance; self-reports of lecture attendance, like self-assessment of the impact of lecture recordings on one’s learning, are likely to be flawed measures. Further research is required to better understand the causative relationship between podcast use and lecture attendance. The primary reasons for podcast use were not necessarily related to missed classes. Examination revision, revisiting complex material, and working at one’s own pace were all predominant reasons for accessing the podcasts, suggesting that students use podcasts to complement rather than supplement face-to-face lectures.

From this study a pattern emerged of podcast users as older, more confident students, who are typically engaged in their learning. Whether using lecture recordings increases academic self-efficacy or whether students with higher self-efficacy are more likely to make use of the recordings, is unclear from the data, although it seems likely that confident students make use of a range of resources available to them. For example, they also contact staff more than non-users.

To determine the direction of the relationship between academic self-efficacy and podcasting experimental studies could be developed. In the meantime some knowledge has been gained from this study. For example, for the most part the students who reported not using podcasts appeared to make the choice consciously, preferring the learning opportunities provided in face-to-face lectures to podcasts. Half of these students rated the learning available in face-to-face lectures sufficient for their purposes. Of particular note, however, are the small number of students who were unaware of the lecture recordings or unsure how to access them. Students with low academic self-efficacy were over-represented amongst this group. Given the attention paid to the podcasts by staff in all the courses chosen for the study these results were surprising. In part this finding may be a function of the newness of the technology within the university; as it becomes more commonplace these reasons for non-use will hopefully decrease. In the meantime the finding highlights the value of emphasizing innovations several times throughout a course and the importance of providing sufficient training for students, particularly those who may otherwise lack confidence in their ability to meet the demands of study.
Uptake and satisfaction varied across courses supporting the notion that mandatory podcasting may be inappropriate. The significant finding for year level and satisfaction may provide useful information for staff planning to introduce podcasts across programs. First year students, dealing with transition issues, may prefer in-person delivery of material. Year level differences offer an interesting and potentially profitable variable for future research.

Limitations of the study

In interpreting the results of the present study two points are important to bear in mind. First, evaluating an intervention in the first year it is introduced is undoubtedly useful, but complex. On the one hand, information collected from a trial phase can be instrumental in shaping subsequent deployment and save considerable time and resources in the future. On the other hand, early adopters of technology are frequently faced with teething problems. In the present case, the students articulated some of the problems. Some lectures did not record properly and not surprisingly students noted this unreliability. This is likely to have impacted on use as well as satisfaction ratings and may further influence both student and staff confidence in the technology in the future. Working with lecture recordings requires specific skills of lecturers to ensure that listeners can make good sense of the recording. Some of the issues with sound quality noted by students can be relatively easily fixed with the use of lapel microphones and with appropriate training for staff, e.g., remembering to repeat questions and comments from students.

Some of the findings of the present study may be an artifact of the university’s newness to podcasting and caution needs to be applied when comparing the present findings with studies from universities where the technology is well embedded. The tendency for Lectopia users to attend lectures less frequently than non-users is a case in point. As users become familiar with technologies they will undoubtedly gather feedback on the most effective ways to use them and adapt them in ways that are useful and meaningful for them. As students become familiar with lecture recordings we might therefore expect evolution in the ways they use them. Studies of early adoption therefore provide a snapshot, but are not necessarily predictive of future use.

Second, the response rate to the second survey, which was administered online after the completion of examinations, was low, limiting generalisability. Although this second questionnaire was hampered by a low response rate, it provided important information about actual, rather than anticipated use of podcasts for examination revision. Given that examination revision appears to be the primary reason students use the podcasts, collecting reliable data on this aspect is important. The relationship between podcasting use and grades could be further examined. Using incentives might be one way to encourage better responses to surveys conducted after semester has finished.

Future directions

Students in the present study suggested a range of useful changes to podcasting provision. Extending the use of podcasting to all courses underscored the positive evaluation of this technology. Videoing the lecturer, a facility currently available through some programs, also highlighted the value of the face-to-face lecture and students’ perception that non-verbal communication adds to the learning experience. Also suggested was the chapterising of recordings. At present podcasts are typically available as a single recording. Chapterising recordings would enable easy searching and permit students to find specific sections more efficiently. Given that one of the primary reasons for using podcasts appears to be to review specific, difficult material facilitating this process would be a worthwhile goal.

A number of suggestions for future research are indicated by the present study. The belief that lecture recordings will decrease attendance is often cited by academics as reason to avoid offering podcasts. Exploring the causal links between podcast use and lecture attendance is therefore an area of future research. In addition, it would be useful to tease out the possible interaction between year of study and discipline in student use of and satisfaction with lecture recordings.

Conclusion

In conclusion lecture recordings have proved to be a technology valued by students. As podcasts are increasingly embedded into courses and programs, uptake by staff and students is likely to increase and the ways in which they
are used is likely to evolve. As usage develops it will be important to continue to explore the characteristics of effective use.

References


Oblinger, D.G., & Oblinger, J.L. (2005). Is it age or IT: First steps towards understanding the Net generation. In D.G. Oblinger & J.L. Obblinger (Eds.), *Educating the Net generation* (pp.2.1-2.10). EDUCAUSE.


