TITLE

THE USE OF PODCASTS TO ENHANCE RESEARCH-TEACHING LINKAGES IN UNDERGRADUATE NURSING STUDENTS

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Abstract

An understanding of research is important to enable nurses to provide evidence-based care. However, undergraduate nursing students often find research a challenging subject. The purpose of this paper is to present an evaluation of the introduction of podcasts in an undergraduate research module to enhance research-teaching linkages between the theoretical content and research in practice and improve the level of student support offered in a blended learning environment.

Two cohorts of students (n=228 and n=233) were given access to a series of 5 "guest speaker" podcasts made up of presentations and interviews with research experts within Edinburgh Napier. These staff would not normally have contact with students on this module, but through the podcasts were able to share their research expertise and methods with our learners.

The main positive results of the podcasts suggest the increased understanding achieved by students due to the multi-modal delivery approach, a more personal student/tutor relationship leading to greater engagement, and the effective use of materials for revision and consolidation purposes. Negative effects of the podcasts centred around problems with the technology, most often difficulty in downloading and accessing the material. This paper contributes to the emerging knowledge base of podcasting in nurse education by demonstrating how podcasts can be used to enhance research-teaching linkages and raises the question of why students do not exploit the opportunities for mobile learning.

Introduction

The enhancement of research-teaching linkages is viewed as an important aspect of undergraduate education, as engaging the student in understanding the issues in discipline-based research is an important graduate attribute (Healey & Jenkins, 2009; SHEEC, 2010). One of the key problems often faced in higher education is the chasm between research active staff and the teaching of students, with students often having no contact with the staff who are conducting research in their discipline. Jenkins, Healey and Zetter (2007) suggest sharing case studies of discipline-based research as an effective way to strengthen the relationship between staff involvement in discipline-based research and their role as teachers of that discipline. Thus enhancing the research-teaching linkages. The authors of this paper used case studies in the form of podcasts to enhance the teaching-research linkage in an undergraduate research module. Podcasting has been used successfully within the University and recent pedagogical research also suggests it is a useful technology to promote active engagement in learning (Vogt *et al.* 2010).

This paper reports the experience of introducing podcasts to a blended learning module, the *Principles of Research and Evidence Based Practice* in January 2010. It includes our reflections on the value of this approach in enhancing research-teaching linkages and discusses how podcasts may be used effectively to improve student learning. These reflections are supported by an analysis of the module evaluation questionnaires completed by students in this cohort compared to previous cohorts as well as the observations of the lecturing team.

Literature review

The advantanges of podcasting in education

"Podcast" is the term commonly used to refer to a series of digital media files (either audio or video) that are released episodically and can be subscribed to using an RSS (Really Simple Syndication) feed. This mode of delivery is what differentiates podcasting from other means of accessing media files over the internet, such as direct download or streamed webcasting, although it is still possible to do this. The automatically downloaded files can be stored locally on a computer or other device (such as a mobile phone) ready for offline use, giving simple and convenient access to regular releases. The most commonly used audio file format is MP3. When podcasting is used in conjunction with MP3 players and other portable devices, the potential for real any-time, any-place learning is opened up, taking us into the realm of mobile learning (m-learning).

Podcasting has been used successfully in teaching and learning in many different student groups (Salmon and Nie 2008). In theory podcasts provide educational content in a format that is convenient to the student as it is available 24 hours a day and can be accessed whenever and wherever the student chooses (Lazzari, 2009). However McKinney, Dyck and Luber (2009) note that whilst the mobility of learning is often cited as an advantage of podcasting, students in their study choose, overwhelmingly, to listen to podcasts on a computer in a "study-like" environment. McKinney, Dyck and Luber's (2009) study was focused on the use of podcasts for

missed classes, rather than relying on class notes from a peer. They compared two groups, one who attended classes accompanied by PowerPoint® slides and the other group who used podcasts of the lecture they missed accompanied by the PowerPoint® slides. The difference in academic efficacy was assessed by analysis of student performance in the two groups. The researchers found that the students in the podcast group did significantly better than those who had attended classes, a finding which is explained by the opportunity students have to replay the podcast as many times as they wish in order to improve understanding.

A number of authors have identified the key educational benefits of incorporating podcasts into the teaching portfolio: Heilesen (2010) outlines some of the uses of podcasting as catching up with missed classes, reviewing and revision of course content at a pace that suits the individual learner, and highlights podcasts as being particularly useful for students for whom English is a second language. Heilesen (2010) concludes that merely being able to listen repeatedly to podcasts allows the student the opportunity to understand the material and may also improve study habits if they are listened to in conjunction with note taking. McKinney, Dyck and Luber (2009) also concur that when combined with note taking the educational achievement of students is greater than if listened to without note taking. Conversely, the findings of a study by Lane (2006) which archived classroom lectures as podcasts, did not find any significant effect on learning.

Additional learner benefits of podcasts have been highlighted: Honey and Mumford (2006) suggest podcasts offer an additional benefit to the learning experience for students whose learning style is mainly audio; McKinney, Dyck and Luber (2009) suggest that podcasts help to keep students motivated as it engages them in a format they are used to, however this may be an assumption as a minimal number of students in the study had never downloaded a podcast despite owning an MP3 player. Added to this, questions remain unanswered as to the academic effectiveness of podcasts (Lane 2006; Heilesen, 2010). A recent review paper by Heilesen (2010) concluded that the evidence base to support podcasting as an effective educational tool was weak, despite there being an emerging body of literature on this subject. However, most of these studies are small scale projects which examine the effectiveness of podcasts as archived classroom lectures. Heilesen (2010) did highlight that the podcasts have been shown to have a positive impact on the learning environment where it was used as a pedagogic tool rather than a summary of classroom-based teaching.

Despite the concern over the lack of robust evidence, other "soft" evidence suggests that podcasts are generally well received by students. Fernandez, Simo and Sallan (2009) researched the effectiveness of a series of 13 podcast episodes and explored whether this series enhanced distance learning students' personal study. They concluded that podcasting offered an effective media to complement traditional teaching, but did not act as a substitute.

The limitations of podcasting in education

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The limitations of podcasts are less well discussed in the literature, but there are a number of significant limitations to this approach that the lecturer must recognise before adoption. Accessibility concerns are the main consideration, as podcasting media requires that a podcast user have the ability to hear and sometimes see. Transcribing the podcast is an obvious route to overcoming this issue, but has obvious additional costs associated with it. Additionally, the reversion to a text format denies the additional benefits of podcasting to students with hearing or sight impairments.

Technical limitations are also present, in that the podcast user must have a computer at least to be able to download the podcast and to listen to any audio file. Furthermore, to download podcasts on a regular basis the computer must be connected to the internet by a reliable broadband connection as the size of an average podcast (up to 1MB/minute) precludes the use of a slower dial-up connection. In 2007, 61% of households in the UK had an internet connection (Office for National Statistics, 2010), and 84% of those households were using broadband for that access (BBC, 2007). This means that nearly 50% of households in 2007 were still without broadband access, which accounts for a significant proportion of the population. This may be offset in large part by internet access which is available at a student's educational institution, but it still shows that access to this type of technology cannot be assumed.

Besides technical and accessibility issues, there are some pedagogical and learning design issues related to podcasting, one of which is its single mode format. There are many strands of learning design theory that show the benefits of learning materials which utilise two complementary presentation modes, such as narration and text, or speech and video. This is known as multi-modal transmission and one such strand of research describing this approach is Mayer's Multimedia Principals of Learning (Mayer, 2001). Mayer states in his Modality Principle that students learn more effectively when information is presented in two modalities simultaneously. In the context of podcasting, this means that visual material should be presented alongside the audio in order to teach in the most successful manner, but obviously in an audio-only format this is not possible. This limitation could be circumvented, however, using newer technologies which much more easily facilitate video media in podcasting, such as mobile digital devices like the iPhone® and the iPad®. This could be a future development of this work.

Use of podcasts in nurse education

With nurse education now firmly rooted within higher education the approaches to learning, teaching and assessment have become consistent with those of the wider higher education community. The emergence of new technologies to enhance student engagement in learning, along with a generation of students who have grown up with technology, has resulted in nurse educators being expected to embrace the new technologies and integrate these into their portfolio of teaching methods (Haigh, 2010; Vogt *et al.* 2010). However Kala, Isaramala & Pohthong (2010) warn that technology alone will not result in effective learning. They go on to suggest that a close alignment between the choice of technology and underpinning pedagogical approach is crucial for learning to be successful.

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The pedagogical theory of constructivism, used as part of a student-centred approach to learning, is both consistent with the current educational environment and encourages the student to develop their own body of knowledge based on their learning experiences (Kala, Isaramala & Pohthong, 2010), therefore the learning environment is crucial to engaging the student in active learning. The use of podcasts along with online learning materials offers students the benefits of the multi-modal approach to learning, thus enhancing their experience. Indeed much of the literature reports satisfaction from students who have experienced podcasting in their learning, and research from the nursing student population also supports podcasting as a positive learning tool (McKinney & Page, 2009; Vogt *et al.* 2009; 2010).

Aims

The purpose of this paper is to report the outcomes of an evaluation of the introduction of podcasts in an undergraduate research module in the School of Nursing, Midwifery and Social Care at Edinburgh Napier University.

Sample

A convenience sample of two cohorts of students (cohort 1, n = 228; cohort 2, n = 233) who undertook the *Principles of Research and Evidence Based Practice* module were asked to evaluate the use of podcasts as part of the module evaluation process. The module is accessed by undergraduate pre- and post-registration nursing students as well as undergraduates from allied health professions. It is delivered using a blended learning approach with WebCT as the platform for delivering online content.

Methodology

This module is delivered using a blended learning approach using WebCT as the platform for the online content, along with four bi-weekly tutorial sessions which build on the online learning activities. The module is accessed by undergraduate pre- and post-registration nursing students as well as undergraduates from allied health professions.

Students from previous cohorts of this module have reported to the module team anecdotally, and through more formal feedback, that they find research a challenging subject. Following a professional development workshop the module leaders agreed to develop a podcasting site to complement the module content for the *Research and Evidence Based Practice* module. Podcasting was therefore used in an attempt to bring research closer to the student and to make it easier to understand. The aim was to provide students on this module with access to staff within the University who were active researchers but normally had limited contact with undergraduate nursing students. Many of these staff have conducted research which is influencing the way in which nurses and other health and social care practitioners are practicing in Scotland; we therefore wanted to bridge the gap between research and practice by interviewing the researchers, treating them as guest speakers, and delivering this via

podcast in the module.

A series of five podcasts were created and made available through links to the podcasting host service at appropriate times within the module content in WebCT. The students could subscribe to the podcast feed and have these podcasts delivered automatically to their mobile devices if they so chose. The podcast site is available at http://prebp.podbean.com/

Ethical Considerations

Students were informed that podcasts were a new introduction to the module and were provided in addition to the usual learning materials. Evaluation was done as part of the usual module evaluation methods using Ultimate Survey (an online questionnaire) with specific questions relating to the podcasts added. Students consent to take part in the evaluation was indicated by their voluntary completion of the questionnaires. Anonymity was preserved as the questionnaires are completed and returned anonymously therefore no identifying features are on the evaluation forms. This process of "implied consent" adheres to the Royal College of Nursing (2011) guidance on informed consent for nurses which states that "implied consent may arise when express written and/or verbal consent is not given; for example, when a participant implies their informed consent by returning a completed anonymised questionnaire" p6)

Data collection and analysis

Questionnaires were made available online to students from both cohorts at the end of each module using "Ultimate Survey". A request to fill in the module evaluation was made on WebCT and a reminder was also sent. The questionnaires contained both quantitative and qualitative questions and were completed by a total of 71 (15% response rate) students (38 from cohort 1 and 33 from cohort 2). Whilst the response rate is poor, sadly it is not unusual for this type of evaluation.

Quantitative data was collected using nine questions in the Ultimate Survey electronic questionnaire (see appendix one). These were analysed using a descriptive statistical analysis approach. As the purpose was to provide a descriptive evaluation of the impact of the introduction of podcasting more sophisticated analysis was deemed unnecessary.

Qualitative data was analysed thematically by two of the authors, looking for commonalities and extracting key statements typical of the theme. Themes were clustered and key statements illustrative of each theme have been used to support the authenticity of the findings.

The data from the quantitative and qualitative sections of the questionnaire have been themed to provide a coherent presentation and enhance understanding.

Findings and discussion

Analysis of the data has highlighted a number of advantages and disadvantages which have been organised into themes. The majority of the positive themes

highlighted were the "impact on the learning experience", "convenience" and "satisfaction", whereas the main disadvantages were related to "issues with technology".

Impact on the learning experience

The majority of respondents reported that the podcasts had had a positive impact on their learning experience. A significant advantage of the podcast from the students' perspective was that they were easy to understand, with 77% of respondents reporting. Comments from students included:

> "It is a different way of learning which I liked and when there is a lot of reading and work to do on your own it is good to feel like you have some teacher interaction."

> "I found it easier as someone was explaining things, reading and gaining and understanding is great but hearing someone explain points enhanced my learning."

These comments highlight the benefit students perceive from having an audio as opposed to text-based explanation. The first comment also suggests the personal interaction that is perceived when listening to podcasts is valued. The comments here appear to concur with the findings of previous studies (Fernandez, Simo and Sallan, 2009; Maag, 2006) with regards to the positive and personalised effect on the student/lecturer relationship.

The feedback from students suggests that the podcasts appear to have been very beneficial in helping the students to understand and put research into context which concurs with findings from Lonn and Teasley (2009). 53% of respondents reported that the podcasts helped them to make sense of the module content. Comments to illustrate this finding include:

> "The podcast was the core learning material for me, to make sense of the WebCT context and the tutorials."

> "The final podcast from [the] Professor seemed to be the most relevant to the learning material and gave me a better understanding of the research process."

In addition to this some of the comments from students provided insight into how podcasts help to accommodate their different learning styles and needs. A number of students specifically commented that online learning can involve a lot of reading from the computer screen and reading of core text therefore podcasts offer a welcome break from this activity. For example, one pointed out that:

> "Reading can often be tiring and you can often zone out. The podcasts suited my learning style better."

Another student reported that listening to the podcast helped her to retain a lot of the information:

"...after the second podcast I realised how much of the information covered actually stayed in my mind as I thought about the research theory we were being taught."

These comments highlight the potential for integrating different technologies to meet the needs of different learners in order to maximise their potential learning and enjoyment of the subject thus supporting Mayer's theory of multi-modal learning activities (Mayer, 2001).

The convenience of being able to revisit the podcasts for revision purposes was highlighted by a number of respondents as illustrated by the following comments:

"I was able to listen again and again if I never understood something."

Satisfaction

The aim of producing podcasts for this module was to allow students access to research staff that they do not normally have access to, thus enhancing the research-teaching linkages, which is one of the Scottish enhancement themes (SHEEC 2010). The following comment suggests this was particularly appreciated by the students:

"...as it was a professor from Napier it was very exciting to hear her speak in person."

Overall the feedback from students indicated a high level of satisfaction with the podcasts. All respondents indicated that they were satisfied with the quality and length of the recordings. Each recoding was between 7 and 19 minutes long. Whilst this is very encouraging it is interesting to note that students still valued the written word to complement podcasts as this comment demonstrates:

"I would have also liked to have the podcast in text form to remind you of some of the content."

This provides support for the view which suggests that podcasts should not be viewed as a replacement for other learning activities such as online and classroom based teaching but that they offer an enhancement to the learning environment (McKinney, Dyck & Luber, 2009).

Convenience

Whilst the intention of podcasting is to allow students the flexibility of being able to download the podcasts to mobile phones and MP3 players, none of the respondents in this study used a mobile device to listen to the podcasts, all preferring to use a computer either at the university (17%) or more commonly in the home setting (82%). This finding supports the findings of earlier studies by Evans (2008) which showed that only a quarter of their students listened to the audio whilst travelling and Lonn and Teasley (2009) reported that their students predominantly listened to the

podcasts at their home computers.

Although the students in this study did not chose to use mobile devices to listen to the podcasts the flexibility was still appreciated as this comment demonstrates:

"Podcasts can be listened to in a variety of locations making them accessible."

Lee, Miller and Newnham (2009) attempt to problematise the lack of subscription to podcast feeds by students but acknowledge the fact that this is still an emergent use of technology and suggest there remains a lack of technical knowledge from staff and students. Perhaps future studies will see more uptake of this mode of delivery allowing for further exploration of the benefits to learning.

Issues with technology

The main disadvantages in relation to podcasting were clustered under this theme heading. "Issues with technology" was used to capture the problems students faced with accessibility in terms of having access to a computer, broadband connections, along with technical aspects of downloading the files as highlighted by these comments:

"If you don't have a home computer it is difficult to listen to them."

"Took too long to download."

A recent study by McKinney and Page (2009) also emphasised such difficulties but our study did not uncover issues with lack of confidence in the use of podcasts as highlighted in their study, and this is encouraging.

Limitations

The main limitation of this study was the low response rate to the student survey. For a sample to be representative of the population from which it is drawn, a minimum response rate must be achieved. Krejcie and Morgan (1970) suggest a minimum confidence rate of 95% and a maximum margin for error of 5% is required. Using their formula this requires 152 responses from a survey of 250 participants. This study can only be used to gain insight into the types of effects the podcasts had on students, rather than allowing us to state definitive results. The qualitative comments given by the respondents in this study do, however, add weight to the results and allow a robust qualitative analysis to counteract the limited quantitative outcomes.

Conclusion

Podcasting offers nurse educators the ability to embed additional content from researchers or clinicians to help students make links between their theoretical learning and practice. This paper has focused on a project which aimed to enhance the research teaching linkages. Despite the low response rate which limits the conclusions that may be drawn from the quantitative analysis, the overwhelmingly positive qualitative response does allow us to draw the conclusion that the podcasts have had some greatly beneficial effects in this area and would encourage further

research into their effectiveness. The findings in this paper also highlight the main areas of improvement to investigate, such as an increased sense of personal interaction with the tutor, the benefits of catering to other learning styles and the increased comprehension and revision possibilities offered by this persistent resource.

When podcasting is used in conjunction with MP3 players and other mobile devices, the potential for real any-time, any-place learning is opened up, taking us into the realm of mobile learning (m-learning). Whilst the reality of m-learning was not seen in this project as students overwhelmingly, to listen to podcasts on a computer in a "study-like" environment, further research to identify how m-learning may be promoted would be of value as this technology develops.

References

BBC 2007. Million more UK homes go online. Available from:
http://news.bbc.co.uk/1/hi/technology/6966632.stm

Fernandez, V., Simo, P., Sallan, J.M., 2009. Podcasting: A new technological tool to facilitate good practice in higher education. Computers & Education. 53: 385–392. Available from: http://dx.doi.org/10.1016/j.compedu.2009.02.014

Forbes, M.O., Hickey, M.T., 2008. Implementing and Evaluation in an undergraduate nursing programme. Nurse Educator. 33 (5): 224–227

Haigh, C., 2010. Legality, the web and nurse educators. Nurse Education Today. 30: 553–556

Healey, M., Jenkins, A., 2009. Developing undergraduate research and inquiry. York: HE Academy. Available from:
http://www.heacademy.ac.uk/assets/York/documents/resources/publications/Develo pingUndergraduate_Final.pdf

Heilesen, S.B., 2010. What is the academic efficacy of podcasting? Computers & Education, 55: 1063–1068

Honey, P., Mumford, A., 2006. Learning Styles Helper's Guide. Maidenhead, Peter Honey Publications

Jenkins, A., Healey, M., Zetter R., 2007. Linking teaching and research in departments and disciplines York: The Higher Education Academy. Available from:
http://www.heacademy.ac.uk/assets/York/documents/LinkingTeachingAndResearch _April07.pdf

Krejcie, R. V., Morgan, D. W., 1970. Determining Sample Size for Research Activities. Educational and Psychological Measurement. 30: 607–610

Kala, S., Isaramalai, S. Pohthong, A., 2010. Electronic learning and constructivism: A model for nursing education. Nurse Education Today. 30: 61–66

Lane, C., 2006, UW Podcasting: Evaluation of Year One. University of Washington. Available from:
http://www.washington.edu/lst/research_development/papers/2006/podcasting_year 1.pdf

Lazzari, M., 2009. Creative use of podcasting in higher education and its effect on competitive agency. Computers & Education. 52: 27–34

Lee, M.J.W., Miller, C., Newnham, L., 2009. Podcasting syndication services and university students: Why don't they subscribe? Internet and Higher Education. 12: 53–59

Levette-Jones, T., Lathlean, J., Higgins, I., Macmillan, M., 2009. Staff-student relationships and their impact on nursing students belongingness and learning. Journal of Advanced Nursing 65 (2):316–324

Maag, M., 2006. Podcasting: an emerging technology in nurse education. Student Health Technology Information. 122: 835–836

Mayer, R. E., 2001. Multimedia learning. New York: Cambridge University Press.

McKinney, D., Dyck, J.L., Luber, E.S., 2009. iTunes University and the classroom: Can podcasts replace Professors? Computers & Education. 52: 617–623

McKinney, A.A., Page, K., 2009. Podcasts and videostreaming: Useful tools to facilitate learning of pathophysiology in undergraduate nurse education? Nurse Education in Practice. 9: 372–376

Royal College of Nursing Research Society (2011) Informed consent in health and social care research. RCN guidance for nurses. Second edition. Royal College of Nursing, London. http://www.rcn.org.uk/__data/assets/pdf_file/0010/78607/002267.pdf

Salmon, G., Nie, M., 2008. Doubling the life of iPods. In: Salmon, G., Edirisingha, P., (eds), Podcasting for Learning in Universities. Society for research into Higher Education. Open University Press McGraw-Hill Education

SHEEC, 2010. Enhancement Themes: Research-Teaching Linkages, Enhancing Graduate Attributes. Quality Assurance Agency for Higher Education. Available from: http://www.enhancementthemes.ac.uk/themes/ResearchTeaching/default.asp

Office for National Statistics, 2010. Internet Access 2010: Households and Individuals. Available from: http://www.statistics.gov.uk/pdfdir/iahi0810.pdf

Vogt, M., Schaffner, B., Ribar, A., Chavez, R., 2009. The Impact of podcasting on the learning and satisfaction of undergraduate nursing students. Nurse Education in Practice. 10 (1): 38–4. Available from:http://dx.doi.org/10.1016/j.nepr.2009.03.006

Vogt, M., Schaffer, B., Ribar, A., Chavez, R., 2010. The impact of podcasting on the learning and satisfaction of undergraduate nursing students. Nurse Education in Practice 10: 38–42

Walsh, M., Crumbie, A., 2011. Initial evaluation of Stilwell: A multimedia virtual community. Nurse Education in Practice. 11: 136–140

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Appendix One: Questionnaire Results

1	How easy was it to access the PREBP podcasting site	easy	neither	difficult		
2	What have you used to listen to the podcasts on	University PC	Home PC	PC elsewhere	portable device	
3	What did you think of the tech quality of the recording	Very Good	Good	ok	poor	very poor
4	What did you think about the length of the podcasts?	too long	about right	too short		
To what extent do you agree or disagree with the following statements:						
5	The podcasts felt more personal	strongly agree	agree	no opinion	disagree	strongly disagree
6	I enjoyed listening to the podcasts	strongly agree	agree	no opinion	disagree	strongly disagree
7	The podcasts were easy to understand	strongly agree	agree	no opinion	disagree	strongly disagree
8	The podcast helped make sense of module content	strongly agree	agree	no opinion	disagree	strongly disagree
9	The podcasts were relevant to my learning	strongly agree	agree	no opinion	disagree	strongly disagree