Efficacy of Podcasting: Use in Undergraduate and Graduate Programs in a College of Nursing

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ABSTRACT

The aim of this project was to create podcasts of classroom lectures from select courses across programs in a college of nursing and to explore associated outcomes using a Web-based course evaluation framework. Seventy undergraduate, second-degree, and graduate nursing students participated. Findings suggest that nurse educators can leverage students’ positive attitudes and technologic skills with minimal investment of dollars and no impact on class attendance, building high-quality podcasts that align with students’ unique learning environments and goals. Faculty should consider specific student attributes and associated needs when developing podcasts and in providing guidance and support for students who use these learning tools.

Developing robust online and hybrid classes in nursing education involves incorporation of a variety of teaching strategies and tools (i.e., options such as podcasting) from which students can select components that may benefit their learning. However, before such technology can be widely implemented, health care educators must explore outcomes associated with mobile learning technologies (Boulos, Maramba, & Wheeler, 2006; Maag, 2006b). Thus, the aims of this project were to create podcasts of classroom lectures from select courses across programs in a college of nursing and to explore outcomes to leverage the technology to the good of teaching and learning (Boulos et al., 2006; Maag, 2006b).

Podcast refers to software and hardware combinations permitting automatic downloading of audio files for listening at the user’s convenience (Edutech Learning Initiative, 2009). Podcasting has become one of the major emergent technological trends (Koo & Sandars, 2008) and is starting to be used in health care education (Boulos et al., 2006; Maag, 2006b). The most common use in undergraduate health care education is recording of entire lectures (Boulos et al., 2006). Much of the podcasting research suggests formation of a productive learning experience (Koo & Sandars, 2008) and is starting to be used in health care education (Boulos et al., 2006; Maag, 2006b). The theoretical Framework

Little is known about how Web technology and its learning tools contribute to teaching and learning (Billings, 2000). A theory-driven approach to assessment and evaluation of pedagogic practices using technology has been called for by nurse educators (Billings, 2000; Ingersoll, 1996; Ingersoll & Sauter, 1998). A framework for teaching and learning in Web-based environments in nursing education has been proposed by Billings (2000) that includes five major concepts and associated variables: outcomes, educational practices, faculty support, learner support, and use of the technology. This framework, adapted from models developed to study the impact of technology in higher education, was deemed appropriate to guide this study.

Method

Three student groups were selected for inclusion based on faculty interest in podcasting: undergraduate students in a nursing fundamentals course, second-degree students in a nursing research course, and graduate students also in a research course. The sample consisted of students older than 18 years who were enrolled in the three courses. Participation in data collection was voluntary, although all students had access to podcasts, and the study received institutional review board approval. The investigator initiated collabora-
tive relationships across campus to develop skills and identify appropriate technology to support the project.

Billings’ (2000) Web-based evaluation framework described this component as faculty support. An iPod audio player (Apple Computer, Inc., Cupertino, CA) and a universal microphone adapter (Belkin International, Compton, CA) were used to create digital files of classroom lectures \( (N = 133) \). Equipment cost was less than $200. The average length of podcasts was 22.5 minutes, and 82% of podcasts had accompanying PowerPoint® slide presentations available to students through course management software. Students were oriented to the use of podcast technology in the course and instructed on various techniques of downloading podcasts using the automated feed linked to the university’s podcast server. These elements represented student support and use of technology as described in Billings’ (2000) framework.

Prior to accessing lectures, students completed a Demographic Information Sheet and the Opinionnaire: Computerizing in Nursing (Q-CN) to develop data on attitudes (Thomas, 2001). The Q-CN uses a 5-point Likert scale to measure attitudes of nursing students toward the use of computers in nursing. At the end of the semester, students completed the Student Podcasting Survey developed by Forbes and Hickey (2008) and the Q-CN (Thomas, 2001) was re-administered to assess patterns of students’ podcast use. University server logs were reviewed to gauge the frequency with which students downloaded episodes.

**Results**

**Demographics**

All students in the three courses \( (N = 70) \) volunteered to participate. Mean age was 26.5 years. The majority of the sample was female (86%) and White, non-Hispanic (73%), and 3% of the students indicated English as a second language (ESL). Seventy-seven percent owned an iPod or MP3 player, 89% owned a laptop, and 43% owned a desktop computer.

**Attitudes**

A Cronbach’s alpha of 0.859 was calculated for the Q-CN and deemed acceptable. At pretesting, mean attitude scores were strong (Table). Following podcasting, attitudes for the entire sample improved, but significantly for only second-degree students \( (t = –2.08, p = 0.05) \). Analysis of variance suggested no significant differences in attitudes by group at pretest or posttest. However, significant difference in posttest attitude scores was observed by ethnicity \( (F[3, 65] = 3.29, p = 0.026) \), with lowest scores among Asian students and for students with ESL status \( (F[1, 60] = 5.26, p = 0.025) \).

**Accessing Podcasts**

Forty-seven percent of students reported accessing podcasts during the 15-week semester. A greater percentage of graduate students accessed podcasts (57%), but undergraduate
students’ downloads accounted for 67.5% of all downloads. Second-degree and graduate students did not download all episodes (Table). No significant difference in podcast accessing patterns was observed by group or other attribute.

Listening Patterns
Most listened to podcasts while at home (97%) during the afternoon (42%) or at night (42%). Forty-seven percent accessed between two and five podcasts during the semester. No students reported listening to a podcast in lieu of attending a live class. Most (84%) used laptops or desktop computers to download and listen to podcasts. Undergraduate students most often listened to reinforce learning, whereas second-degree students listened primarily as examination review. Graduate students listened to clarify course content (and used laptops or desktop computers). Difference in access frequency was observed by ESL status, with ESL students downloading significantly more episodes \( F(1, 61) = 8.00, p = 0.006 \). No significant difference in listening patterns was observed by group or other attributes.

Ninety percent of undergraduate and second-degree students looked at textbooks while listening to podcasts. Favoring faculty podcasts over student recordings of lectures, students expressed interest in fair access to the same information for all students, clarity of recordings compared with student taping, and the low effort and cost-free nature of faculty-produced lectures.

Podcasts and Learning
A majority of students reported podcasts were helpful to their learning, and greater percentages of second-degree and graduate students indicated that podcasts were helpful. Viewing podcasts as helpful was significantly different by podcast access frequency \( F(4, 39) = 11.21, p = 0.000 \). No differences here were observed by group or other attributes.

Ranking podcast helpfulness to learning (range, 1 = most unhelpful to 5 = most helpful), 50% of students rated podcasts as helpful (3.4). Higher helpfulness rankings from second-degree and graduate students were noted. Significant difference in ranking was observed by group with undergraduate nursing students assigning lower rankings \( F(2, 39) = 3.64, p = 0.036 \) and by age, with the younger students (age < 23 years) assigning lower rankings \( F(2, 37) = 3.32, p = 0.048 \). No significant difference in ranking was observed by other attributes.

Discussion
Sample size was small, but diversity of the sample parallels characteristics of the Net Generation (Howe & Strauss, 2000) and nursing students across the nation (American Association of Colleges of Nursing, 2006). Although most students owned MP3 players or iPods, supporting the use of technology element in Billings’ (2000) framework, 84% opted to download and listen to podcasts on computers. Dixon and Greensen (2006) noted that more than 80% of downloaded podcasts never reach MP3 players, and empiric data failed to support the belief that Net Generation students will be more comfortable with technology such as podcasting or adjust more easily to devices such as MP3 players (Straub, 2009).

As such, to promote adjustment to podcasting technology, various forms of student support as described in Billings’ (2000) framework were built into the current project, including a classroom-based orientation to podcasting and ongoing technical support from faculty via hands-on assistance and e-mail exchanges.

Attitudes toward computers improved after implementation of podcasting for the entire sample but were significantly higher only among second-degree students. McBride and Nagle (1996) also found positive attitudes toward use of computers among nursing students. In the current study, post-attitude scores were significantly lower for students with ESL status, although proponents of podcasting suggest the technology is ideal for ESL audiences (Brock, 2005; Bull, 2005). Caution in interpretation is warranted given small numbers of students in these subgroupings.

Forty-seven percent of students accessed podcasts; this use rate aligns with that found in existing literature (Edirisingha, Salmon, & Fothergill, 2007; Maag, 2006b). In our sample, a greater percentage of graduate students downloaded podcasts, but this group downloaded only 80% of all available lecture episodes. This could suggest more selective use of learning resources and may represent educational practices and student support elements of Billings’ (2000) framework. Finding that our students with ESL status downloaded significantly more podcasts may add strength to prior observations of undergraduate health care students selecting lectures based on difficulty of lecture content (Brittain et al., 2006) and parallels Billings’ (2000) notion of educational practices.

A majority of undergraduate and second-degree students in this study reported looking at textbooks while listening to podcasts, although McKinney, Dyck, and Lubr (2008) found that students required more active learning techniques to maximize learning outcomes associated with podcasting. Here, Billings’ (2000) framework might suggest that to promote robust outcomes, faculty should provide student support via information on specific learning approaches and guide students in selecting educational practices, such as note-taking, to promote active learning with podcasting.

Approximately half of our sample downloaded podcasts at home in examination preparation. Brittain et al. (2006), studying podcasting of entire lectures, found that 44% were downloaded in close proximity to examinations, whereas Lane (2006) found that 70% of students used podcasts in this way. Few of our nursing students listened to podcasts on-the-go or at school, and this has also been described in the literature (Brittain et al., 2006; Edirisingha et al., 2007; Lane, 2006). Re-exposure to classroom lectures at home in examination preparation suggests time on task...
and a form of virtual student-faculty interaction and supports the educational practices element of Billings’ (2000) framework.

Detractors of podcasting suggest it will lead to empty classrooms (Brock, 2005; Webber, 2005). In the current study, no student expressed interest in using a podcast in lieu of attending class and existing literature supports this finding (Brittain et al., 2006; Lane, 2006; Maag, 2006a).

The majority of nursing students indicated that podcasts were helpful to their learning, and this finding differed by podcast access frequency, with greater frequency associated with higher helpfulness ranking. Among undergraduate nursing students, forms of computer-based learning have been found to enhance learning under certain conditions (Leski, 2009). Maag (2006b) explored the use of podcasts and found that nursing students reported valuable learning experiences associated with the technology. McKinney et al. (2008) found that podcasts users who took notes while listening to podcasts outperformed students who attended live lectures.

In the current study, differences in helpfulness by group, although not significant, were also observed, with a greater percentage of second-degree and graduate students viewing podcasts as helpful. Maag (2006b) noted that podcasts support the needs of auditory learners, which would be identified as an element of educational practices geared toward diverse ways of learning in the Billings’ (2000) evaluation framework. The pedagogical potential of mobile learning technologies include catering to specific needs and cognitive abilities of diverse learners (Joint Information Systems Committee, 2005; Kukulska-Hulme & Traxler, 2005). In our sample, advanced learners may have developed more evolved listening skills that allowed them to better use podcasts. For students with less well-developed listening skills, the use of podcasts, as suggested by Campbell (2005), could allow growth in the essential skill of active listening.

Looking at findings in this study from the perspective of outcomes as defined in Billings’ (2000) framework, students identified helpfulness to learning, access to course lectures, convenience, technology proficiency, and satisfaction associated with podcasting experiences. Similar benefits of computer-based learning in nursing (Leski, 2009; Lu, Lin, & Li, 2009) and podcast-related learning (Edirisingha et al., 2007; Koo & Sandars, 2008; Maag, 2006b; Nathan & Chan, 2007) have been identified. As evident in the educational practices element of Billings’ (2000) framework undergirding the current study and described by Lu et al. (2009), technology, as a lever, facilitated implementation of best practices in education to include active learning techniques, time on task, and diverse ways of learning (Chickering & Gamson, 1987).

Conclusion

With minimal impact on budget, class attendance, and faculty workload—an important faculty support element of Billings’ (2000) framework—nurse educators can leverage students’ positive attitudes and technologic skills, building high-quality podcasts that align with students’ learning goals and contexts. To develop podcasts that allow diverse learners sufficient time and space to interact with the course content (Billings et al., 2001), faculty should consider specific student attributes and associated needs, provide information on specific learning approaches for use with podcasting, and guide students in selecting active learning techniques, such as note taking, while listening to podcasts.

In this work, Billings’ (2000) Web-based evaluation framework, with the five major concepts and associated variables, provided a structured, theory-driven approach to exploring teaching and learning using podcast technology. However, given sample size and voluntary participation, results of this study may have limited generalizability and additional research is needed to understand the effects of podcasts on student performance.

References


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