Podcasting as Complement to Graduate Teaching:
Does it Accommodate Adult Learning Theories?

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Technology in higher education has exploded within the last decade, as educators become more knowledgeable about its uses and students become more demanding of access and convenience to teaching and learning. This article shares results of an exploratory study that determined graduate students' perceptions of podcasting access and utility in courses as related to adult learning theory. Reading materials and listening to podcasts produced favorable results in terms of students' perceived understanding of the subject, with the majority of students surveyed recommending reading the course materials and listening to same-materials via a podcast. A higher percentage of students listened to the podcast in its entirety compared to students reading all of the material presented. Survey results indicated complementary components of adult learning in terms of reflective behavior. A total of 76 percent of students agreed the podcast enhanced or clarified their understanding. Whether the interaction was potent enough to foster action or transformation remains a personal experience based on prior learning. Twelve percent of students were neutral in their response; memorization or rote recall characterized their non-reflective learning experience. Students who perceived the podcast as of no value would not respond to the podcast or reject the podcast as non-important to their learning need as represented by 12 percent of the students in this study. The use of podcasting in graduate courses continues to evolve, and addressing adult learning theory in relationship to technology needs to be further explored.

In the current era of technology in higher education, opportunities abound to utilize hardware and software to assist stimulation, enhancement, and motivation of learning in diverse academic environments. The omnipresence of mainstream media and flexible and independent access to technology has encouraged adult learners to become more receptive to new forms of instruction in the classroom. With on-demand media files, students can now easily download instructional information and lessons from the web to their computers or portable media players and complete course assignments at times amenable to the demands of their personal and professional lives. Similarly, with audio editors easier to use, more educators have learned the process of recording and editing audio, thereby creating access points to learning materials in their courses. In academe, coursecasting has presented a new kind of learning environment, and podcasting, as one technological medium, allows students individual access to course content such as recorded instructions and lectures, graphics, and videos.

Podcasting Application and Benefits

IPods may be as commonplace as cell phones in the lives of individuals. In 2007, Apple reported selling over 100 million iPods (Apple, n.d.), and within the last few years, an explosion of learning with iPods (i.e., podcasting) has infiltrated college and university campuses across the globe. In reviewing enhancement of student-learning experiences, survey results at the University of Washington showed 76% of student respondents owning an iPod or other MP3 player (Lane, 2006; see, also, Evans, 2008). A recent report expanded upon the student trend for access and convenience in learning saying, "To some degree, those [more convenient learning] situations are already happening, and they will be amplified as time goes on: Students will increasingly expect access to classes from cellular phones and other portable computing devices" (Chronicle Research Services, 2009, p. 4).

In early stages of review, podcasting (as well as other newer web tools of wikis, twittering, and blogs) has been examined from student perceptions of utility, use, and receptiveness of the technology application (see, e.g., Richardson, 2006). Student response to the use of podcasting has shown positive perceptions (e.g., Edirisingha & Salmon, 2008; Lane, 2006; Lee & Chan, 2007; Reynolds & Bennett, 2008; Tynan & Colbran, 2007). In 2006, 57% of medical students surveyed indicated that iPod technology with access to content would be useful in learning (Palmer & Devitt, 2007). Podcasts as a form of content review were noted by 45% of students in a course through Harvard Extension School (Malan, 2007), and undergraduate students expressed that podcasts were more effective for review than their textbooks and their personal notes (Evans, 2008). According to Tynan and Colbran's (2007) study, a majority of law students noted podcasting as particularly useful for lecture content.

Other findings suggested the following benefits of podcasting: (a) flexibility and portable convenience (Duke University, 2006; Edirisingha & Salmon, 2007; Evans, 2008), (b) ability to catch up on content (Lane,

2006), (c) reduction of students' anxiety due to isolation in distance-learning settings and their sense of inclusivity (Lee & Chan, 2007), (d) increased student engagement (Carle, Jaffee, & Miller, 2009), (e) improved teaching and learning (Dale, 2008), and (f) enhanced learning experiences (Boulos, Maramba, & Wheeler, 2006).

Then, too, a few research studies found unfavorable attitudes towards podcasting (Knight, 2007) with little learning benefit for students (see, e.g., Abt & Barry, 2007), including limited capturing of visual materials or class discussions (Lane, 2006). Findings in one particular study noted that students' achievement with podcasting will require future study of individual self-efficacy and self-regulation (Hodges, Stackpole-Hodges, & Cox, 2008). And Malan (2007) pointed out, "It is this technology's reach [educational accessibility] that we claim is significant, not the technology itself" (p. 389).

Podcasting and Relationship to Learning Theory

Technology has changed the way students learn, and technology has changed the way educators teach – with this, there are a multitude of options to structure discipline content and provide opportunities for technological application in higher education. However, the receptivity of new and emerging technologies present more questions than answers. As one example, Snyder (2009) explained that educators may select a particular medium (e.g., threaded discussion forum, blog, wiki), because it is available to them or use an instructional method (e.g., lecture, discussion, cooperative groups), because it is the method with which they are most familiar; however, they may not have a clear understanding of how the tool or method supports a particular type of content or instructions. (p. 48)

With the infusion of technology into academic course materials, questions of educational effects and impacts emerge. As practitioners in adult learning and instructional developers of our own graduate courses, we focused on supplementing teaching methodology and learning with podcasting, seeking answers to one question: How does podcasting complement adult learning theory?

In search of answers, we chose to acknowledge adult learner characteristics of our students and then structure specific instruction in graduate courses to address the issue of adult learning theory with the infusion of podcasting. Because the spectrum of adult learning is diverse and broad, the exploratory study discussed in this paper considered one seminal adult learning theory as evident in student podcasting learning experiences. Although there are numerous models in adult learning, adult learning theory is not one single or simple thing, and careful consideration should be given to different learners (Hartley & Bendixen, 2001). There is, however, some agreement that adult learners possess qualifications, as defined in the literature as characteristics. We assumed in the design of course podcasting exercises that our adult students:

- Draw upon past life and work experience, which enables reasoning and reflective thinking during the learning process;
- Exhibit a high need to find relevance and applicability of learning;
- Possess healthy skepticism related to well established attitudes, beliefs, and values; and
- Require readiness, stimulation, and motivation to learn (see, e.g., Brookfield, 1991; Conner & Clawson, 2004; Cross, 1992; Merriam, Caffarella, & Baumgartner, 2006).

We defined Podcasting as providing on-demand audio files that our students can download from the internet to a MP3 mobile device. We did not seek to discuss or debate the value of podcasting in comparison to other learning technology media. We acknowledged and valued the philosophical statement of Daines, Daines, and Graham: "Learning remains the responsibility of the adult learners; as teachers we cannot learn for our students. We can, however, strive to provide sound and accessible learning opportunities for them by thoughtful planning and preparation . . ." (1993, p. 131). Moreover, we decided to utilize one theoretical framework of adult learning in our study: reflective learning theory.

Adult Learning Theory: Jarvis and Adult Life Experiences

Considering the complex, multifaceted, and diverse theories of adult learning, it would not be appropriate here to address each and every andragogical framework of adult learning. Respectful of this, we did examine constructs of learning (Borg & Gall, 1989) within a seminal theory of adult learning, that is, reflective learning theorized by Peter Jarvis (2002a; see, also, 1992, 2006).

Meaning-making is one critical difference between pedagogy and andragogy. With an accumulation of life experiences, adult learners reinterpret an old experience in comparison to a new set of expectations or information, thus giving a new meaning and perspective to an old experience. Choosing what to learn and the importance and meaning of incoming information are often seen through the lens of experiences in life, including prior formal, informal, and experiential learning. Guiding the practice of adult educators in the

twentieth century, Jarvis (1992) explained potential learning as private and individualistic (p. 167), hinging on an individual's reception to disjunctive experiences wherein there is disparity between stored knowledge and information presented (p. 84). With disharmonious experiences, Jarvis believed that students can choose to seek meaning as relative to their experiences – reflected upon, evaluated, and interpreted to reach understanding.

With our fast-paced, changing society, opportunities for learning are ever-present, and an individual's contemplative choice to reflect on something new is part of the process of learning, guided by an adult's concomitance and capacity to self-direct learning. Jarvis (1992, 2002a) emphasized learning as an ongoing process of individuals making meaning of everyday experiences. He further explained:

> Learners do come to education with a great deal of knowledge and expertise. They should not be treated as empty containers . . . Education should now both seek to use the learners' expertise and build on their knowledge, which can be done through a variety of teaching techniques . . . . (in Jarvis, 2002b, p. 208)

Boud, Cohen, and Walker (1993) promoted reflective processes of experiences as critical to transference of learning to new situations for an individual, with lived personal experiences and the intent of these experiences as foundational for reflection (see, also, Leberman, McDonald, & Doyle, 2006).

Although meaning perspectives within reflectivity are exceedingly complex and somewhat controversial in theories of adult learning, their application to conceptualizing and understanding how learning affects students remains invaluable, particularly to facilitators of adult learning utilizing technological tools to complement the learning of students. As Merriam and Caffarella (1999, p. 285) noted, the Jarvis model of adult learning "concentrates on explaining the responses one can have to an experience . . . a strength of the model. These responses encompass multiple types of learning and their different outcomes, a refreshingly comprehensive view of learning." And although there are more recent alternative theoretical conceptions of reflective practice of life experiences, this paper expresses a first step in examining fundamental learning concepts in relationship to podcasting experiences of adult learners.

Because research (see, e.g., Ford & Chen, 2000; Whyte, Karolick, Nielsen, Elder, & Hawley, 1995) found that learning style impacts achievement and successful student interaction in a non-traditional learning environment – for example, online learning – determination of the participants' preferred learning styles might offer additional insight. In conceptualizing learning theory, Boyatzis, Cowen, and Kolb (1995) noted that learning style is a preferred way that an individual deals with information, taking stimuli and constructing meaning (see, also, Kolb, 1984). Learning styles are dependent to, and mutually supportive of, learning theories.

In order to improve our understanding of adult learners' responses to podcasting, an exploratory design was carried out. The objectives included capturing whether the student indeed downloaded and played the podcast. Additionally, we explored the utility of the podcast experience in regards to graduate students' perceptions of *productive use of time* and whether the student would recommend to classmates *listening to the podcast*. The responses to these and other survey questions provide data as to whether the experience allowed for valued knowledge that may then be strategically used in the future.

Methods

The sample of 60 students was conveniently selected from the graduate programs and courses at a large Midwestern university for this study. The graduate courses that introduced the instructional podcast were in Nursing, Social Work, and Library Information Science. Four weeks into the courses, an initial survey was administered regarding the students' perceptions of the required readings and typical unit materials. This permitted a period of control as well as data collection of students' demographics and preferred learning styles (Fleming & Mills, 1992). During the next unit, one week later, a podcast unique to each course with content (no longer than 10 minutes) was uploaded into iTunes via the online courseware. Students were informed of the podcast availability. Podcasts were individualized to each course exercise and included an explanation of unit expectations, overview of the major concepts, or related discussion and reflection. A post-podcast survey was administered to determine the access and utility of the podcast.

Instrumentation for this exploratory study allowed for a comparison of the standard assigned reading to that of the podcast. Survey questions were related to access, number of times the material was reviewed, multitasking, clarification that was achieved, and the potential for the student to recommend that others access the material. The visual, auditory, read/write, kinesthetic (VARK) instrument has been used to help students identify how they learn (Fleming & Mills, 1992). However, some researchers have suggested that the statistical properties are not appropriately robust for research usage (Levine-Brown, Bonham, Saxon, & Boylan, 2008). Since visual and auditory learners appear to have strong classroom learning, we queried

participants as to their preferred learning preference (VARK) in order to explore any overarching preference toward one style (Parker & Mitchell, 2006). The datum from this one question can inform whether potential bias exists as well as assist in framing the discussion.

Both surveys were pilot tested, and IRB approval was obtained. Data were collected by each course professor and combined into a spreadsheet for access and analytical comparison. Data were entered and analyzed via Excel™.

Results

Participation in both surveys was 85 percent (9 of the 60 students chose not to participate), and demographic data points were captured; non-female students represented 15.6 percent and non-white students were 9.8 percent. The students' ages varied

with 49 percent between the ages of 17 to 28, 38 percent between 29 to 44 years, and 13 percent were 45 years or older.

Survey participants were given a choice of learning styles with descriptive options for visual, auditory, read/write, and tactile/kinesthetic (VARK). The results indicated that 35.4 percent of respondents indicated visual, 37.5 percent learned through reading and writing, 16.6 percent indicated auditory, and 10.4 percent identified tactile/kinesthetic as their learning style preference. Learning preferences reveal the ways a student needs to inculcate the materials and concepts. There was no one preferred preference for the participants studied.

Students either accessed the podcast from a laptop, desktop, or mobile device since the podcast was available for download through the university course management system. Only three students reported downloading the podcast to a mobile learning device

Table 1
Access of Reading Versus Podcast *(N=51)*

Questions Regarding Reading and Podcast Access	% YES	% NO
Reading: Did you read the materials from beginning to end?	56	44
Podcast: Did you listen to the podcast from beginning to end?	96	4
Reading: Did you read it more than once?	31	69
One time = 69%, two or more times = 31%		
Podcast: Did you listen to the podcast more than once?	50	50
One times = 50%, two or more times = 50%		
Reading: While reading the material did you do anything else?	44	56
Watch TV, laundry, child care, talk to friend		
Podcast: While listening to the podcast did you do anything else?	65	35
Email, websurf, homework, at work		
Reading: Did you take notes while reading the material?	23	77
Podcast: Did you take notes while listening to the podcast?	40	60

Table 2
Students' Perception for Utility of Reading Versus Podcast *(N = 51)*

Questions Related to the Utility of Reading and Podcast	% Strongly Disagree or Disagree	% Neutral	% Strongly Agree or Agree
Reading: The reading clarified and/or enhanced my understanding of the subject.	14	17	69
Podcast: The podcast helped to clarify and/or enhance my understanding of the subject.	12	12	76
Reading: The reading is not a productive use of my time.	45	23	32
Podcast: The podcast is not a productive use of my time.	66	22	12
Reading: I would recommend that other students taking this course complete the reading.	6	29	65
Podcast: I would recommend that other students taking this course listen to the podcast.	13	11	75

Survey participants were given a choice of learning styles with descriptive options for visual, auditory, read/write, and tactile/kinesthetic (VARK). The results indicated that 35.4 percent of respondents indicated visual, 37.5 percent learned through reading and writing, 16.6 percent indicated auditory, and 10.4 percent identified tactile/kinesthetic as their learning style preference. Learning preferences reveal the ways a student needs to inculcate the materials and concepts. There was no one preferred preference for the participants studied.

Students either accessed the podcast from a laptop, desktop, or mobile device since the podcast was available for download through the university course management system. Only three students reported downloading the podcast to a mobile learning device. Fifty percent of students accessed the podcast more than once while only 31 percent read the unit text materials more than once. More students multitasked while listening to the podcast than when reading the course material with 40 percent taking notes while listening (see, Table 1). Table 2 indicates that 34 percent of respondents agreed or were neutral that the podcast was not a productive use of time while 75 percent would recommend that other students taking the course listen to the podcast. Similarly, 55 percent of respondents agreed or were neutral that the reading was not a productive use time, but 65 percent would recommend that other students taking the course complete the reading.

Discussion

Our exploratory study found that students took advantage of the podcast, and some listened to it multiple times. Not all of the students read the written material, and fewer than half read it more than one time. The students tended to multitask more while listening to the podcast than when reading the written material. The most common additional task was taking notes while listening to the podcast. As such, the students generally believed they were more productive while listening to the podcast than while reading the written material.

Most all of the students listened to the podcast on a desktop or laptop computer and not on a mobile device. This does not support the idea that students wish to be more mobile when learning. It is possible that the students were accessing the podcast at work, school, or somewhere other than home while listening, but it does not appear that the students listened to the podcast while being mobile. Age may have played a role in how the students listened to the podcasts. Fifty-one percent of the students were 29 years of age or older and have not grown up in the age of iPods and MP3 players, thus they may not have been as tech savvy as younger students.

Students were not asked if they had any technical difficulties in listening to the podcasts. It is unknown whether students tried, but were unable, to download the podcasts to their mobile devices. The students strongly supported the readings and the podcast as important for subsequent students to complete when taking the course in the future.

A low percentage of the students responded that they were auditory learners as opposed to visual or reading/writing learners. The findings might have been different with a diversity of students; multiple methods of delivery might be needed to meet the various learning styles of all students. Since only one question explored learning style, the impact of this result can perhaps guide future work related to adult learning preferences and podcasts.

The podcast experience illustrates Jarvis' model (2006) as either non-learning, a non-reflective experience, or as a reflective learning experience (see, Figure 1). For instance, students who perceived the podcast as of no value would not respond to the podcast or reject the podcast as non-important to their learning need. This option can be accomplished through choice of non-engagement as represented by 12 percent of the students in this study. These students disagreed that the podcast enhanced or clarified their knowledge as related to the course. Interestingly, four percent of students did not access the podcast from beginning to end. Conversely, students that valued the podcast as important to their learning milieu would access the podcast and integrate the content as part of the reflective learning experience. A total of 76 percent of students agreed the podcast enhanced or clarified their understanding. Whether the interaction was potent enough to foster action or transformation remains a personal experience based on prior learning. Some students that neither had a reflective learning or non-learning interaction with the podcast may skim the podcast, not reflect on the material but mimic the material presented. Twelve percent of students were neutral in their response; memorization or rote recall could characterize their non-reflective learning experience.

The adult learning theory of Jarvis is conceptually described in the aforementioned examples of podcast experiences as reported by this graduate student population. Graduate students are knowledge seekers in that they seek additional learning to expand their prior knowledge. Adult learners with life experience are positioned for meaning-making which presents an ideal scenario for educators. Instructors may want to consider podcasting as a medium to assist with learning, providing a structure for analysis or interpretation for content, thus fostering improved reflection.

Figure 1
Response to a Podcast Learning Experience by Adult Learners
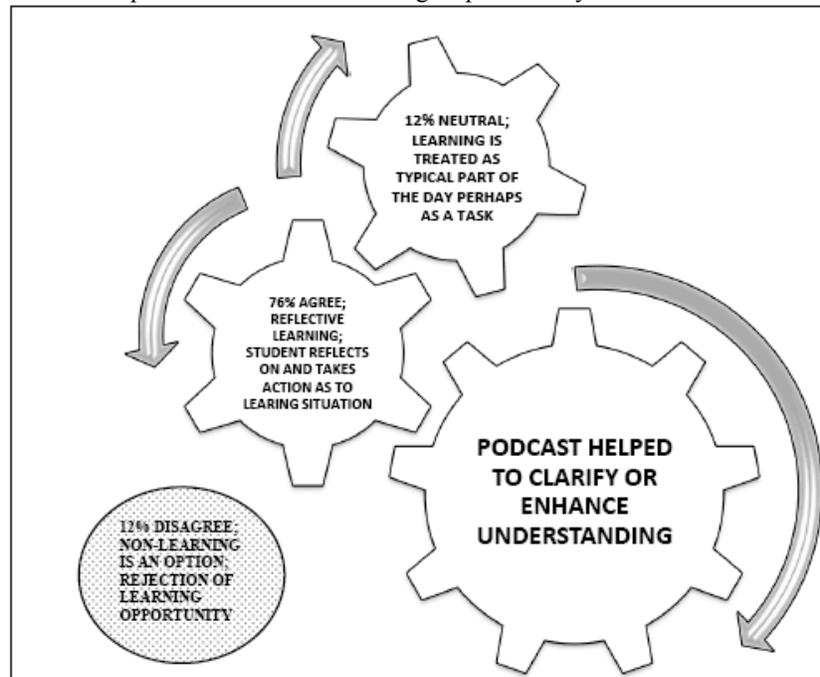
A Future Glimpse of Podcasting and Adult Learning Theory

With dynamic technological changes in higher education, the need for more convenience, rapidity, and abundance of technology will endure. The focus on learners will change teaching and learning, and as recently predicted, "The faculty member, therefore, may become less an oracle and more an organizer and guide, someone who adds perspective and context, finds the best articles and research, and sweeps away misconceptions and bad information" (Chronicle Research Services, 2009, p. 10).

Although some support (see, e.g., Brill & Park, 2008) that emerging technology research include examination of andragogical theory designed for the student learning experience, most studies has not connected technology and learning theory. At present, this research need exists. For educators as organizers and guides, podcasting as a complement to the adult learning theory may be a persistent technological application in teaching and learning.

Results presented in this article support adults' learning via the application of podcasts, but more research is needed to determine the effectiveness of this application. The intention of this exploratory study was to describe how podcasting may complement adult learning theory as conceptualized by Jarvis through the examination of delivered instructional podcasts and the perceptions of graduate students. The use of podcasting in graduate courses continues to evolve, and addressing adult learning theory in relationship to technology needs to be further explored.

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