Instructional Podcasting with Undergraduate Digital Natives

Kevin M. Thomas[1] and Dottie Willis
Bellarmine University, Louisville KY, 40205

Abstract

This paper analyzes the use of instructional podcasts with students in introductory computer application classes at a small, independent, private university. Participants were all undergraduates in the school of education. In an effort to model effective use of instructional technology for preservice teachers and to "meet digital native students where they live," the course instructor created podcasts to augment class instruction and create a 21st century learning environment. Focus groups were conducted to capture students' perceptions of these supplemental podcasts. Surprisingly, the majority of these digital native participants reported that instructional podcasts were not beneficial to them because of their lack of time, lack of familiarity with the technology, resistance to using instructional technologies, preference for face-to-face instruction and reluctance to make the time commitment.

Keywords: Podcasting, undergraduate students, Net Generation, millennials, digital natives, teacher education, differentiation.

The students filling the seats in classrooms and lecture halls in college and universities today are digital natives who have never known a world without the digital tools that have come to dominate most of their lives. Having grown up with ubiquitous access to technology, these students have an intuitive use of a wide variety of devices (Oblinger & Oblinger, 2005). Computers, video games, mp3s and social media are just a few of the technologies that students use to communicate, collaborate and learn from on a daily basis. In fact, students entering college spend daily 90 minutes on the computer, 75 minutes playing video games, 44 minutes listening to their mp3 player (Rideout, Foehr, & Roberts, 2010) and 106 minutes social networking on Facebook (Junco, & Cotton, 2012). Some researchers believe that as a result of the amount of time spent using technologies digital natives have even begun to think and learn differently (Oblinger & Oblinger, 2005; Prensky, 2001; Tapscott, 1997).

One example of how digital natives differ from their predecessors in regard to learning is their preference for multitasking. Dr. Barry Adams, during his spotlight presentation at the 2010 *Imagining the Future of Learning Conference*, shared an encounter he had with a university student. The student was walking across campus listening to an mp3 player when Dr. Adams and a colleague stopped him. When they asked to what he was listening, the student's response was "in which ear." Podcasts, like the one described in this story,

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[1] Corresponding author's email: kthomas@bellarmine.edu

are an excellent technology for meeting the learning needs of digital natives because they allow them to multitask. Students can listen to podcasts while jogging, sitting at the doctor's office or driving to school. In addition to allowing students to multitask, podcasts have been shown to have a number of instructional benefits. With this in mind, the first author created podcasts to augment course instruction with undergraduate students in the school of education. The purpose of this study was to discover students' perceptions of the use of podcasts to enhance instruction in a 21st century classroom. More specifically, we had three study questions: 1) Did students use the instructional podcasts? 2) If so, what did student perceive to be the benefits of such use? 3) Conversely, if students did not use the podcasts, what did they perceive to be the barriers to use?

Review of Literature

Digital natives are identified as anyone born after 1980. Having grown up with digital technology, digital natives are believed to be more comfortable using technology than the generation of "digital immigrants" born before 1980. Prensky (2001) notes that digital natives who have spent their entire lives surrounded by and using technology have begun to "think and process information fundamentally differently from their predecessors" (p. 1). They prefer receiving information quickly, multitasking, accessing information non-linearly and relying on communication technologies for accessing information (Kennedy, Judd, Churchward, Gray, & Krause, 2008).

One communication technology preferred by digital natives is the mp3 player. In fact, 74% of teenagers own an mp3 player (Lenhart, 2009). One use of mp3 players is for listening to podcasts. Podcasts are audio or video files, usually in an mp3 format, that can be downloaded for broadcast/listening on either a computer or more often on an mp3 player—like an iPod—thus the name podcast. Students can download school-related podcasts to their mp3 player to listen to when and where they want (Gatewood, 2008; Gay, Price & Searle, 2006). This anytime, anywhere access allows students to multitask (Rideout, Foehr & Roberts, 2010; Kennedy, et al., 2008; Prensky, 2001). For example, students can listen to an instructional podcast while riding the bus to school, exercising and/or walking to and from class. The growing popularity of 3G smart phones with internet connectivity and mp3 players further increases the accessibility of listening to or downloading online podcasts.

Podcasts can be created with free, easy to use Open Source software like *Audacity* or Web 2.0 programs like *Vocaroo*. They can then be uploaded for free to Web 2.0 applications like weblogs and wikis or placed on social networking sites like Facebook for access from anywhere with an Internet connection.

The use of podcasts by both teachers and students is rapidly gaining acceptance (Dlott, 2007; McClain, Boyle, Franks, Komoff, & Kratcoski, 2007; Putman & Kingsley, 2009; Vogt, Schaffner, Ribar, & Chavez, 2010). Podcasts have many school-related applications. For example, podcasts can be used for curriculum augmentation, professional development, supplemental material presentation and effective communication with school stakeholders—faculty, staff, community, parents (Gatewood, 2008; Hürst & Waizeneg-

ger, 2006; Norman, 2004). Teachers can use podcasts to record lectures, reviews and classroom demonstrations. Additionally, supplemental materials like video clips, interviews, and news, to name a few, can be podcasted.

This allows students to repeatedly access podcasted content as well as control both the speed and the pace of information being presented, thus allowing them to adequately process the content before more information is presented and lost (Wall et al., 2010). Teacher-generated podcasts also differentiate instruction by appealing to audio or visual learners (Gatewood, 2008) and for scaffolding and frontloading (McClain et al., 2007).

Student-created podcasts also have instructional benefits. For example, creating podcasts can increase student engagement, collaboration and motivation (Dlott, 2007; McClain et al., 2007; McLoughlin, Lee & Chan, 2007; Oliver, 2005). Creating podcasts can also improve students' retention of information (McClain et al., 2007). Likewise, student podcasts can improve the meaningfulness of students' learning by increasing their sense of ownership (Anderson, 2005). Ownership, in turn, can lead to improvements in students' retention of information (McClain et al., 2007). Finally, creating podcasts often requires writing a podcast script which has been shown to improve students' writing skills (Dlott, 2007; McClain et al., 2007).

Additionally, podcast were used with this population of undergraduates, preservice teachers because the most important component in the successful integration of technology into education has long been identified as teacher technology preparation (Culp, Honey, & Mandincach, 2003; National Council for Accreditation of Teacher Education, 1997; U.S. Department of Education, 2000). In addition to knowing how to use new technology, teachers must also understand the interplay between technology, pedagogy and content knowledge (TPCK). Faculty must effectively model the use of technology for preservice teachers (Brown & Warshaur, 2006; Vrasida & McIsaac, 2001). Therefore, this study focuses on undergraduates' perceptions of instructional podcasting in a computer applications course required of all preservice teachers in a school of education.

Methodology

Focus groups were selected to answer the study's questions for a number of reasons. First, focus groups allow for in-depth and time-efficient exploration of a topic. They also allow the experiences, attitudes and beliefs of participants to be discovered. While findings from focus groups are not widely generalizable, reliability can be achieved by conducting multiple focus groups (Grudens-Schuck, Allen & Larson, 2004). Furthermore, findings from focus groups have high "face validity" because they are actual statements from real people. In other words, focus groups measure what they set out to measure and provide faith in the collected data (Freitas, Oliverira, Jenkins & Popjoy, 1998).

Intervention

At the end of each class in both sections of *Computer Applications in Education*, exit slips were collected from students in both sections. Exit slips are an excellent method of

assessing students' understanding at the end of each class and enable students to ask individual questions that they might be reluctant to pose in front of the entire class. (Fisher & Frey, 2004). Exit slips provided information regarding students' comprehension of the day's learing and informed the direction of instruction for the lesson to follow. The exit slips asked students a number of short questions about the day's lesson (See Table 1).

Table 1. Sample of Exit Slip Questions.

1. What did you learn today?
2. From today's lesson, about what would you like to learn more?
3. What questions do you have?
4. Was there any part of the lesson in which you need further instruction?
5. What questions do you have about Web 2.0 (weblogs and wikis)?
6. What questions do you have about the midterm?

After collecting students' responses on the exit slips, the instructor (first author) reviewed and categorized them. Any repetition of questions was avoided so as not to add time to the podcast by answering the same question twice. Participants in this study generated over 150 different questions.

After the exit slips had been collected and categorized, the Open Source audio recording and editing program, *Audacity,* was used to create the podasts that answered students' exit slip questions. *Audacity* is an excellent tool for creating instructional podcasts because it allows the user to pause or to stop and start over in the case of error without having to re-record the entire podcast. With *Audacity*, any errors can be edited after completing the recording. Each podcast consisted of the instructor reading and then answering a question posed by one or more students. Once each podcast was completed, it was exported to an mp3 format, labeled by the date of the class and saved in a "Podcasts" folder created on the online course management system, *Blackboard*. This allowed students to access the podcast from anywhere with an internet connection. Students were shown how to download a podcast from *Blackboard* so that the podcast could be placed on an mp3 player and accessed from anywhere. Podcasts ranged in duration from three to nineteen minutes; the average length was eight minutes. This procedure was completed separately for each of the two course sections. While the instructor devoted five-ten minutes to reading and sorting students' exit slips and then an average of eight more minutes to recording each podcast, this process was still more efficient and effective for the teacher than answering individual questions through e-mail. Students could also receive answers to their questions before the next class, saving instructional time and preventing confusion.

Participants

Participants were drawn from two sections of undergraduate students taking *Computer Applications in Education*—a course required of all undergraduates in the school of education at a small, independent, private, university in the south. One section consisted of

20 (17 girls and 3 boys) students. All but one of the students in this class were first se-
mester freshmen. The second section consisted of 15 (11 girls and 4 boys) students. All
but three of the students in this section were first semester freshmen. Both sections were
taught by the first author. All of the students in both sections completed exit slips as part
of the course and had access to the podcasts on the course management system, *Black-
board*.

All of the students from both sections were invited via email to participate in focus
groups to discuss their use of the course-related podcasts at the end of the semester. Of
the 35 students in the 2 course sections, 15 (11 girls and 4 boys; 8 from one section and 7
from the other) agreed to participate in the focus groups. The fact that all of the students
were undergraduates majoring in education and taking the same course helped to ensure the
homogeneity of the focus groups.

Participants' Exit Questions

The instructional podcast were designed in reponse to students' exit slip questions. Anal-
ysis of the content of the podcasts revealed that students' questions fell into three distinct
groups: technical, procedural, and application of course content. Technical questions,
representing 57% of the total inquiries, were related specifically to technology concerns
such as the students' own construction of podcasts: 1) "Can the file be edited outside
Audacity?" 2) "Do you have to have a microphone/headset if your computer has those
built in?" and 3) "How do I make sure my podcast works?" Procedural questions, ac-
counting for 37% of all students' exit queries, dealt solely with individual concerns about
course expectations, due dates, and grading. Representative samples include "How long
is the Benchmark (assignment) going to take and when should I start?" or "Are we able to
turn in late assignments for partial credit?" Only six percent of all questions posed by
students could be classified as application of course content. Students were attempting to
make connections between content in this class and their future classrooms such as
"What are specific activities we can use podcasts for in the classroom?" or "How could
you use podcasting with a math lesson?"

Data Collection

In order to accommodate students' schedules, five focus groups were conducted over the
course of a week in a neutral conference room in the school of education. Group sizes
ranged from two to five participants. Multiple focus groups on the same topic also pro-
vide a cross section of perceptions on the topic which helps ensure reliability (Grudens-
Schuck, Allen & Larson, 2004). Informed consent was gathered from participants at the
beginning of each focus group.

The focus groups were facilitated by a skilled moderator. A set of guiding questions was
developed for the interviews. These questions were developed based on the research
questions, the review of literature and an initial analysis of students' exit slip questions
over the course of the semester. However, a "funnel approach" was used in questioning.
This approach begins with initial broad questions and moves to more specific questions
based on participants' responses (Morgan, 1996). Each of the five focus groups lasted

roughly one hour and was video- and audio- recorded. Additionally, the facilitator kept notes on students' comments.

Data Analysis

Analysis of the data began immediately after the end of the focus groups. Two forms of data analysis were used: qualitative summary and systematic coding through content analysis. The qualitative summary focused on the direct comments from the group discussions; whereas the content anaylsis focused on numeric description of the data (Freitas, Oliverira, Jenkins & Popjoy, 1998). This was accomplished through transcribing the recorded discourse from the focus groups. Then, the transcribed discussions were poured over to identify emerging themes from the multiple focus groups. Finally, transcribed discussions and emerging themes were corroborated with the moderator's notes.

Findings and Discussion

Findings revealed that 66-six percent (10/15) of the focus group participants did not believe the instructional podcasts were beneficial. Surprisingly, students in the focus groups reported accessing the podcasts, on average, only once. Students reported a number of reasons for this belief. The number one reason students cited for not utilizing the podcasts was a perceived lack of time. Students also acknowledged a basic unfamiliarity with the technology—podcasting. Additionally, students expressed a reluctance and/or resistance to several technologies, including podcasts. Finally, students admitted a preference for face-to-face instruction. Each of the reasons students identified as barriers for adopting the use of the course podcasts will be explored further in the sections below.

Lack of Time

Students offered a number of time-related reasons for not using the podcasts more. Students stated that they did not have the time to access the podcasts. As one student noted, "A lot of times I forgot about it. It was an outside of class type of thing and once I get out of class I am busy. It just got pushed to the side." Other students felt there were too many steps involved in accessing the podcasts. A student commented that she had to "go to *Blackboard*, then the discussion board and figure out which one it was and download it onto my computer and open another file with windows media player." Other undergraduates also felt it was just one more place they had to go to get information, and they "could not remember to go and access them." Many students felt the podcasts were too long, and they would get bored or "space out" while listening and waiting for their question to be answered or for information that they found relevant. While lack of time is a common barrier to adoption of instructional technologies (Ertmer, 1999), one of the purported benefits of instructional podcasts is their ability to allow students to *save* time by accomplishing multiple activities at once—multitasking (Rideout, Foehr & Roberts, 2010; Kennedy et al., 2008; Prensky, 2001). The potential for multitasking with podcasts was noted by one student who commented that "Usually I do podcasts in my car. But I am in a dorm. Maybe if I was a commuter I would use it more." However, overall, the partici-

pants did not find the podcasts to be useful for saving time by multitasking. Rather, they perceived use of podcasts to be overly time consuming.

In the discussion of time as a barrier, it is important to note that the podcasts were on average only eight minutes long. Allowing for the amount of time it takes to login into *Blackboard*, go to the podcast folder and click on the dated podcasts, this would appear a small time commitment in contrast with the average total of three hours per day that students in focus groups reported spending on their computers - mostly *multitasking* between social networking and school work. Perhaps the barrier was one of priority. Based upon their reflections in focus groups, participants did not perceive these podcasts to be sufficiently beneficial to *commit* the time to accessing and listening to them.

Unfamiliar with Technology

Participants in this study also attributed their lack of use of instructional podcasts to their unfamiliarity with the technology. In fact, sixty-six percent of the students in the focus groups acknowledged that prior to participation in the study they were unfamiliar with podcasts and reported that they used their mp3 players primarily for entertainment - listening to music.

Although contrary to the popular image of the technology savvy "digital native," this finding supports a growing body of literature that reveals "digital natives" may be less technologically savvy than previously thought and that their technological skills vary greatly. The use of exit questions at the end of each computer application class may have actually encouraged some students to ask fundamental questions about technology that digital natives would be expected to know: 1) Can you put music in a podcast? 2) What is software? 3) How do I save to a USB thumbdrive?

Like the students who engaged in the focus groups for this study, many digital natives understand a limited number of applications—texting, instant messaging, social networking and downloading music but are unfamiliar with many other technologies (Kennedy et al., 2008; Lei, 2009; Bennett, Maton & Kervin, 2008). And while most digital natives own mp3 players, they are still unfamiliar with podcasts (Kennedy et al., 2008; Cameron, 2005; Fernandez, Simo, & Sallan, 2009). In fact, only 26% percent of digital natives have downloaded a podcast (Zickuhr, 2010). However, all of the students in this study were familiar with podcasting. As part of this computer applications course for students in the school of education, they were assigned course readings about the instructional uses of podcasts. Afterwards, they even created their own instructional podcasts. In fact, the podcasts that they created for this course were required to demonstrate a student-centered use of podcasting in their future classrooms.

Reluctance and Resistance to Some Technologies

Many of the participants indicated that not only did they not find the podcasts in this course beneficial, but they did not see any instructional benefit for podcasts. For example, one participant felt the static nature of the podcasts was not well suited for instruction: "If

the student was to ask a question and the teacher would answer it the way that he thought was the answer but it was not what I was looking for there would have been no way for me to re-ask the question." While such a negative response was particularly disconcerting for the instructor since the participants had created their own instructional podcast as part of the course, it was also supported by other research. In a more comprehensive study at a large northeastern university, Lei (2009) also found students did not perceive any instructional value in podcasts. Additionally, 40% of 2,120 student participants in a study by Kennedy et al. (2008) were either uncertain about or resistant to using podcasts in their learning.

Participants' resistance to the use of technologies to support instruction was not limited to podcasts. Although all the participants in the focus groups "supported" the use of technology by their professors, they did not see the instructional value of a number of additional technologies. In this introductory computer application class for future teachers, students indicated that they did not support the use of social networking—Facebook—or cell phones—texting—for instructional use. Also, many of these participants stated that they would not take an online course. Several participants in the focus group even expressed a concern that students can become too dependent on technology. Again, this sentiment is echoed by other research studies which found that students worry that they might begin to rely too heavily on technology and that technology should be used in moderation (Lei, 2009; Kennedy et al., 2008).

These findings, like those of Cameron (2005) may suggest that the participants in the focus groups are still not the complete "digital natives" touted in much of the literature because of their resistance to the use of technology for instructional purposes, specifically online learning, as well as their unfamiliarity with some technologies.

Preference for Face-to-Face Instruction

Focus group participants also stated that a barrier to use of the instructional podcast was a preference for face-to-face, personal instruction. Participants wanted their questions to be answered in the classroom by their instructor. As one participant stated, "I would rather be in the same room with the person; I would have more of a connection. I could ask questions." Another participant supported this comment, "I didn't feel like I was interacting with people and I was getting the one-on-one with the professor." Similar to participants' perceptions in the studies of Lei (2009) and Kennedy et al. (2008), participants in the five focus groups valued traditional instruction and ways of learning, although they agreed that their professors should use technology. In consideration of this finding, it should be noted that the participants in this study attend a small university that promotes itself as having small class sizes and small student-to-teacher ratio. University literature promises that students will not be taught by graduate assistants and students will get to know their professors personally. Many students select our small university precisely because they desire that type of personal instruction and interaction.

Limitations and Considerations for Future Research

A number of limitations should be considered when interpreting data from this study. For example, it is important to recognize the limitations in regard to generalizability. The participants in the study were taken from the school of education in a single, small university in the south. The focus groups were also made up of a small number of participants. Therefore, findings from focus groups are not considered to be readily applicable to the larger populations. Additional limitations include the fact that participants self-reported; therefore, what they reported may not be consistent with their actual experiences. Furthermore, the group environment of the focus group can result in a "group think" that is also inconsistent with individuals' actual experiences. However, focus group findings do provide a "snap-shot" of this particular group's reality—in this case undergraduate digital natives' perceptions of teacher-generated, instructional podcasts.

Taking this into consideration, additional research should be conducted to answer a number of questions raised by the findings from the participants in these five focus groups. For example, how can teacher educators who purposefully integrate twenty-first century technologies into their instruction overcome students' resistance to these new pedagogical tools? Based on the fact that only six percent of students asked exit slip questions related to the authentic application of course content, how can university instructors more effectively model and encourage undergraduates to connect college course material to the implementation in their future professions? Another relevant question to be answered is whether students enrolled in large laboratory classes or students attending a larger university might respond more favorably to instructional podcasts designed to answer their individual questions? If these "digital natives" found podcasts less than user-friendly, what other form of technology would they be more likely to choose to support their learning? Furthermore, almost every student participating in this study was a first semester freshman making a transition to college expectations and demands. Would seniors or graduate students or classroom teachers be more responsive to the use of instructional podcasts as a pedagogical tool to augment and/or differentiate instruction?

Conclusion

The purpose of this study was to utilize instructional technology in order to model best practices for using emerging technologies and to meet the needs of digital-native students; however, despite literature on digital natives that professes their affinity for technology, the undergraduate students in this study preferred not to use instructional podcasts. Students reported not using the podcasts because of a lack of time and unfamiliarity with the technology. Surprisingly, they also expressed a resistance and/or reluctance to the use of this technology for instruction and a preference for face-to-face learning. Despite these findings, the authors will continue to work to identify and to model additional uses of podcasts and other instructional technologies because of the growing body of research that demonstrates their instructional viability including their potential to differentiate instruction in 21st century classrooms.

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