Evaluating Students' Responses to iTunes U as a Rich Media Delivery Solution for Teacher Education

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Abstract

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Keywords
Scholarship of teaching and learning, iTunes U, New media

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Abstract

Content management and delivery systems are becoming central to the support and expansion of distance education at universities. A case study was conducted at a Midwestern university to examine the use of iTunes-U as a potential venue for supporting teacher education. Implications for research and next steps are discussed.

Growing Demand

A new generation of students are showing up to universities with a new set of expectations from their instructors and institutions that suggests traditional university technology instructional environments need to evolve (Pew, 2005; Tapscott, 1999). Technology tool development has a great potential to change traditional classroom environments in higher education in light of the growing need for distance education as we are confronted with new reality of "What makes college courses relevant to a future work related field?" Pink (2005) in his commentary on the new thinking of students put it this way. Faculty should be asking themselves, "Am I offering something that satisfies the nonmaterial transcendent desires of [students in] an abundant age?" Though a decade ago universities may have been tempted to scoff at the notion of distance education for professional certification or graduate degrees, the growing trend for student enrollment, course offerings, and number of institutions turning to online options is providing a formidable opponent for retaining enrollment in today's institution. Because more students are showing up to universities through distance education venues the volume and demands imposed upon online learning environments is intensifying it may be time to reassess the student and institutional needs to support distance education.

Distance education student populations are growing and in response, so are the providers elbowing their way into the game. The reasons are clear. There is an increased need for students or "head count" in courses as Federal and State budgeters struggle to make their bottom lines more efficient. In the light of increasing head count, the costs of expanding faculty lines, providing buildings and classrooms, and adding new infrastructure seems expensive options for the short term gains that online programs offer for increasing enrollment and subsequent tuition revenue. Adding to the mix competition between institutions like in teacher credentialing, budget cuts, and the culture of people commuting and wanting land better job while enrolling in school. Mobile lifestyles make distance education seem more necessary and tool development appears to be making it easier. At least that is what the new marketing wave for adult education has said, which has added its own flavor to pushing college education, inflated credentials, good buys, and one stop shopping. All those things are happening to make people turn to an option for distance education.

Within scholarly discussions of distance education, only one thing can be predicted: the demand for distance education will not vanish and the number of institutions turning to online options is providing a formidable opponent for retaining enrollment in today's institution. The discussions surrounding the future of distance education need to be about possibilities rather than predictions. The globalization of education, major global crises, expanding populations, and lack of access to quality education will provide a demand for basic, higher, continuing, and lifelong education through distance education.

Many U.S. educational institutions are (re)examining the role of higher education in distance education. As more students in K-12 schools participate in distance education, institution of higher education need to prepare for a greater acceptance of and desire to partake in distance education by their students. In 2008, over 1 million public school students in K-12 classes were participating in online courses (U.S. Department of Education, 2009). These students are currently or will be attending institutions of higher education fully prepared to participate in distance education courses. Not only will students in the U.S. be ready, but the globalization of education is producing a population in need of online courses. Transnational education through online learning will be expanded as rapid advances in the Internet, multimedia, and online learning technologies continue to advance.

Available Tools and Purposes for Specific Use

The collection of tools available for these options include 3rd party options from vendors (e.g., Pbwiki, YouTube, Edwiki, Blogspot, Google Tools) and building infrastructure on your own campus for delivery (includes staff and training and development tools) high volume purchasing solutions like Blackboard. Each of these web environments offers for different customizable tools for engaging the Web 2.0 learner.

Vendor	Type of Services	Website
Blogspot, WordPress, BlackBoard	Blogging	http://blogspot.com http://codex.wordpress.org/
YouTube, Vimeo, Voicethread	Hosted Video Streaming	http://youtube.com http://vimeo.com http://voicethread.com
BlackBoard, Top Hat, Moodle, EdWiki, PBWorks	Discussion Boards, Content Management Systems Wiki editing, discussion threads, email contacts	http://www.Blackboard.com http://edwiki.org, http://pbworks.com http://www.toptech.com

Vendor	Type of Services	Website
EdMoto, Google for Educators	Web hosting, html editing	http://blog.edmodo.com/ http://www.google.com/edu/teachers
iTunes University, Podcast Generator, AudioAcrobat, Hipcast,	Rich media hosting, RSS feeds Podcast Generation Podcast Distribution	http://apple.com/itunes http://www.hipcast.com/ http://www.audioacrobat.com/
Sakai CLE	Hosted collaborative environment for learning, research, teaching and evaluation	http://sakaiproject.org
Dropbox	File sharing and editing	http://dropbox.com

Chart 1. Example Options and Website links for Web 2.0 Tools

It is important for the distance learning faculty to select the kinds of features that are most appropriate for the intended outcomes of the course. Sometimes assignments require only the ability to post text and responses to assignments. In the case where instructors are only seeking peer interactions commenting in text to an embedded link or online resource, blogging is typically adequate (Boas, 2011; Deng & Yuen, 2011; Hamstra, Kemsley, Murray, & Randall, 2011; Lai & Ng, 2011).. Blogging tools allow every member to view and contribute to the prompt as well as subscribe to the thread for updates. Blogging can be a good solution if the goal of the instructor is to promote a text interaction environment. Another kind of interaction instructors may want to tap into is the ability to share and contribute beyond the written text (Lee & Woods, 2010; Liu, Kalk, Kinney, & Orr, 2012).

There are a variety of media creators available online and hosts which easily interact with those media creation tools. While Voicethread allows students to record and post voice recordings to visual prompts, YouTube and Vimeo allow fully interactive video solutions to edit and post video productions as well as subscriptions and channels to manage media. These tools allow a video production aspect when more creative endeavors are important course outcomes.

Still another need many educators seek for their students is the need to compile and jointly edit web repositories, websites, and collaborative spaces. EdWiki, PBWorks, TopHat, Google tools, Moodle, Sakai CLE and other free and paid vendors provide environments where students can be given variable levels of access for content design and creation for larger

and more complex products (Korcuska & Berg, 2009; Lee & Woods, 2010; Ross, Morrison & Lowther, 2010). These are user friendly sites which are sometimes mediated by templates which allows for smooth design, familiar built in tools, and user friendly environments. Web delivery of these collaborative spaces allows the joint creation that links peer to peer web publishing and authoring with online resources which can be hosted for free even after the conclusion of the semester. Such collaborative environments are often more desirable for course delivery than BlackBoard or other higher education purchased solutions as they allow the general public access to the recourses without the need for filtering and firewall protection offered by most university portals.

Other assignments, however require a more rich media environment. For example, providing downloads of large video files with protected user authenticated access is a larger task than most general servers and podcast providers handle well (Abdous, Facer & Yen, 2012; O'Donoghue & Cochrane, 2010; Owston, Lupshenyuk, & Wideman, 2011).. In addition, uploading files into specific managed accounts that every student can subscribe to and remain discrete from other users is a desire particularly those operating under the expectation of confidentiality. This is often an issue of Schools of Education who wish to assist teachers in reflecting on teacher practices when anonymity and confidentiality agreements must be maintained.

Podcasting represents one such venue where it is important to stream and subscribe to specific content. Podcasting has been used widely for at least two separate functions. First, it has been used to document and archive information in audio lecture and enhanced podcast forms. Some have reported increased student achievement as a result of implementing such systems (Owston, Lupshenyuk, & Wideman, 2011). However, researchers often fail to discriminate between other learning factors in the classroom and rush to attribute learning outcomes to the use of the tool itself. A second documented use of podcasts it the creation of and interaction with media in production activities to allow students to co-construct knowledge in otherwise traditional environments (Holbrook & Dupont, 2010; Hill & Nelson, 2011; Kay, 2012).

The real difficulty for faculty is often the test of how the environment handles rich media assets across a variety of devices and conveniently combines licensed media with classroom information for ease of access for students. As a result of our need for delivering rich media to students conveniently, we needed to consider RSS (Real Simple Syndication) solutions. We discuss those options and features we considered in the next section.

RSS Solutions for Rich Media Delivery

RSS technology has significant benefits to both the user and the producer. These benefits include the ability to deliver content is via XML based technology right to a user's computer or device (e.g., laptop, tablet, mobile device). The user determines which RSS feed they will subscribe to and subsequently that personalized content is syndicated directly to a user's computer or device (Lee, Miller, & Newnham, 2008).

But XML syndication protocols are not limited to RSS. Outline Processor Markup (OPML) and Atom have the same functionality. Initially, these syndication protocols were text-based synopses, but now they have the capability to make available newly created and disseminated media rich content (Lee, Miller, & Newnham, 2009). As soon as the content is

available, it appears on the user's computer or device. There is no need to manually download content because of the functionality of the aggregator. The content does not tie up space on the user's computer or device. Rather, these smarter delivery systems examine the available files locally and remotely and files are simply "pushed" to user (Lee, Miller & Newnham, 2009). The XML file is distributed as a snapshot of content" (Glotzbach, Mohler, & Radwan, 2007; Garret & Nantz, 2006). Because of the recent developments the implementation of RSS is inexpensive and ubiquitous only requiring a web based account any device or computer.

The way it all works requires the understanding that RSS operates through content aggregators. An aggregator is a client-side program, which "must be configured to periodically poll one or more subscribed feeds for updates and then deliver content to the user's desktop" (Lee, Chan, & McLoughlin, 2006, p. 2896). Glotzbach, Mohler (2006) contend that the use of RSS personalizes and enhances the distribution and organization of content on the Internet. The content is not "bundled"; instead, it employs a distribution model. The aggregators collect, index and deliver each piece of content as it is created and published (Garret & Nantz, 2006). Instead of focusing efforts on finding materials, users need subscribe to an RSS feed which populates their devices with personalized content. Users assume an active role, determining what populates their devices. The user experiences an efficient interaction between time and content. They spend less time searching for content, which affords greater time to explore customized content delivered to them. This is of particular important in providing strong educational content as videos of teaching can have a wide range of content and quality. When instructors want their students to view a particular kind of teaching expertise, they need only push it to their students rather than have students wandering and searching the internet for potentially valuable content. Since this content can be delivered from a variety of sources like wikis, newsgroups, discussions and websites is updated, users receive instantaneous notification (Lee, Miller, & Newnham, 2008).

Aside from it being simple, user-friendly, and cost-effective, RSS has other affordances. Glotzbach, Mohler, & Radwan, (2007) state that student research via RSS is more streamlined; there is no sifting through endless websites to find current and relevant content. Once the students determine the source, the aggregator does the work increasing student efficiency. Also, student research via RSS becomes both individual and collaborative. Students can contribute to collective research efforts through shared feeds, while maintaining individual interests. Having the ability to customize content is a significant benefit, providing the user with greater control and ironically, greater collaborative opportunities. *Garret & Nantz (2006). In a learning community model, students do more than* subscribe to an instructor's feed; they subscribe to each other's. Instead of the content solely being instructor driven, students may determine and share their own interests (Garret & Nantz, 2006). Students become more active, gathering their own resources instead of simply depending on instructor materials (Lee, Miller, & Newnham, 2008).

iTunes U Usage in Higher Education

Of the RSS options available to the public, iTunes U is the most closely examined solution for rich media delivery. iTunes U has been tauted as one of the premier ways to tap into the top universities providing free content as well as aggregator for instructors own media. Though it used to be limited to serving only .m4v, .mp4 formats and .pdf files, the course

builder now allows many additional formats for instructors including .doc files. iTunes University (iTunes-U) is currently cooperating with universities and non-profit organizations to provide free resources to students of all ages. This has grown from just over 2 dozen in 2006 when Apple's Vice President John Couch made a whirlwind tour across our nation's landscape stopping at no fewer than 300 universities in just over year. Apple's vision was to make content available only at the top tier schools available to all learners. Now there are over 900 universities working with iTunes U creating, capturing, and disseminating content for free with a click of the mouse and on a subscription basis. iTunes U is not only a means to distribute and manage media rich content, but it also improves the learning environment. Content dissemination, for optimal use, must be platform-agnostic and speedy, with RSS capability, auto delivering content to subscribers. The content is thus accessible on the students' devices when needed. iTunes U supports audio, video, and PDF files, and these files can be uploaded and shared by both the instructors and the students. iTunes U is a free service by Apple, who supports and manages all upgrades. One of the reasons iTunes U has caught on so rapidly is that as distance education grows exponentially, universities need a reliable, cross-platform media delivery system.

iTunes U has been implemented and studied at a number of institutions for uses that span the provision of regular lectures to sports event archives to the RSS subscription of students to general information services for incoming Freshman. For example SUNY-Cortland implemented iTunes U for the purpose of solving technical issues delivering large files for writing projects and GIS solutions (Reid, 2008) while Stanford and Berkeley used iTunes U as a general public window into the expertise attending students have access to in courses like mathematics and philosophy. Many institutions have not launched campus wide initiatives with all faculty for a variety of reasons including faculty buy in and limited resources (Tarkowski, Salwach, & Rotenberg, 2008).

Of those institutions who have studied their implementation of iTunes U, the responses are as varied as their purposes. McKinney, Dyck, and Luber (2008) made a straightforward comparison of lectures and Powerpoint supported by iTunes U and the ability to subscribe, store, and replay lectures while notetaking. The results showed that students had higher achievement than in a simple lecture format. Of course there was full agreement that iTunes U was a good supplement for lectures, but their study examined iTunes as a replacement media. Part of their conclusions were attributable to the fact that students listened to the lectures more frequently than in the standard "lecture condition." The authors are quick to recognize that iTunes U should not replace lectures or attendance.

In contrast, iTunes U implemented for other reasons revealed no significant improvement in student performance Abt and Barry (2009) studied iTunes U with physiology students finding that there was little quantitative benefit for students over and above written text when learning exercise physiology. Of course many studies examine the use of iTunes U for purposes it was never intended and some innocuous findings are suspect given the research demonstrating some students continue to excel in tasks on mobile devices over and above the supportive PC platforms they use when connected directly to their networks (Tossell, Kortum, Shepard, Zhong, & Rahmati, 2008). Because of the varied findings in achievement and task performance, there is reason to continue evaluating iTunes U as a potential learning supplement in higher education.

There is some general agreement regarding the students' preferences to the use of iTunes U even if the research findings are less than conclusive. The first area of agreement is the

approximated use of young learners. Though this generation has been described by many as hyper connected and expert users many authors find that young college users do not frequently seek podcasts as a venue for learning (Robson and Greensmith, 2008). Even after specific instruction surrounding RSS feeds, students did not regularly show an increase in frequency of subscribing to or viewing podcasts for the purposes of their learning in higher education settings (Glotzbach, Mohler, & Radwan, 2007; Miller & Newnham, 2009; Robson and Greensmith, 2008). Despite the characterizations by may of (Pink, 2005; Tapscott, 1999) podcasting and RSS subscriptions are not currently the venue of choice for learning of the millennial generation.

The second area of agreement among researchers studying iTunes U and RSS subscriptions is that students do not see it as a replacement for face-to-face instruction. Most students do see an improved learning experience when using iTunes U and RSS subscriptions (Robson & Greensmith, 2008; O' Donnell, 2009; Chan & Lee, 2008) as students report there is an increased organization of content, less time spent downloading or streaming online media, flexibility of use including repeating and reviewing content, and increased enjoyment of the course. In addition there is little to no evidence that students are abandoning traditional lectures in favor of mobile devices. To the contrary a minority of students believe that they would learn better independent of class attendance and a large majority disagree with statements like they no longer need to attend lectures (O'Donnell, 2009; Robson & Greensmith, 2008).

For these reasons scholars agree that iTunes U implementation should be coupled with expert pedagogy which is consistent with the intent and outcomes of the profession. Such pedagogical concerns related to RSS feeds include encouraging students to make use of information and expertise beyond the classroom as regular practice, designing courses which emphasize the importance of diverse and varied expertise, organizing content (e.g., metatags, icons, titles) in a way that makes quick recognition possible and downloads easily manageable (Lee, Chan, & McLoughlin, 2009; Chan & Lee, 2008; Lee & Miller, 2009). Only when these teaching and organizational practices are in place can additional benefits be rendered from student compositional work which includes remixing media, authoring and creation of learning artifacts which constitute another level of reflecting upon learning practices.

Our interest in analyzing the use of iTunes U and RSS feeds stemmed from our need to facilitate teacher reflection on actual teaching events. Preservice and inservice teachers attending the university had experienced rare opportunities to observe lessons where inquiry was a prominent mode of instruction. Teaching observed by most of the university students was traditional and pedagogical variety was essential for stimulating more divergent discussions of teaching practice. iTunes U was used as a repository of example lessons which could be deployed easily and carried as mobile media as opposed to the streaming media methods used at our university. Most of the students attending our university own Windows machines and our typical computing solutions are also Windows based. With iTunes U growing so rapidly we decided to explore the question at our university,

"How will university education students respond to iTunes U as a course enhancement tool on a predominantly Windows-based university campus?"

Methodology

We adopted a case study approach to examining the use of this environment as it represented only a small set of course offerings at our institution all posited within a single Graduate School of Education. Case study research is a scientifically valid strategy that relies on numerous sources of evidence. A case study approach allowed us to adopt an in-depth perspective within the real life context of the teacher and students. It allowed for a number of variables in a situation to be examined and presented as a single set of findings. Our particular case study approach followed the model of Stake s (1995) guided by a qualitative orientation. It seemed the appropriate approach as teachers studying each other's classrooms as it is characterized by "researchers spending extended time, on site, personally in contact with activities and operations…reflecting, revising meanings of what is going on" (Stake, 1998, p. 445). Ours is a collective case study (Stake, 1998) as we compared with similar instruments the findings of multiple classes implementing the same tool; namely iTunes-U. In our case this methodological approach is characterized by rich, detailed, in-depth information about a small number of participants. As such, there are implications in attempting to present broad generalizations to other populations.

Our data sources were three course sections offered in science education, library studies, and educational technology. We began with a pilot study conducted 12 months prior examining 2 courses in educational technology as we developed the survey, interview questions, and advised course instructors about improvements in the instructional delivery to match the concerns of students. Following this pilot study we expanded our data collection to include 6 courses in the College of Education. We collected in each classroom observations, questionnaires, exit interviews, and two exit surveys pertaining to the use of the tools in class as well as the general facets which added or detracted from the stated learning objectives of the course. While the students voluntarily selected themselves as candidates to share in the exit interviews, total anonymity was retained for the exit surveys. We allowed students to volunteer for data collection so our sampling biased towards students who desired to give our research team feedback.

The statistical analysis used for the general university context was conducted separately from the 31 participants. The general usage report was based upon 36 questions administered to all university students designed in consultation with Instructional and IT support staff. This survey (n = 2,421 total) was analyzed using SPSS yielding a 95% confidence level, asserting a confidence interval of 1.9 percentage points for most questions answered by the total valid responses.

The 31 participants offering interviews and supplemental data did not represent a substantive subset of data to be representative or for any statistical test to be generalizable. We therefore turned to our qualitative means of interpreting the data collected—establishing credibility and verifiability in the place of reliability and validity. We required complete data sets for all participants allowing for quasi-triangulation of our claims. This meant that simply filling out the survey was not sufficient for inclusion in our data set. Incomplete data sets were excluded and as a result the convenience sample allowed us a total number of subjects of 31. We were able to triangulate across data samples to keep in check any efforts to over-glamorize the use of the new tool for the purposes of pleasing the interviewers. Participants were interviewed regarding the teaching approaches and use of the online tools (e.g., iTunes-U). We applied the trustworthiness criteria (Guba & Lincoln, 1989) and methodological triangulation protocols of Denzin (1984) and considered the

perspective and role of the researcher, to ensure the study s findings and interpretations were valid.

Findings

Our university is a predominantly Windows-based environment offering standard BlackBoard services and Realtime Streaming. We therefore expected a modest response from our students using iTunes. Indeed when we surveyed students enrolled in courses where professors were using iTunes-U over 45% of the students used Windows PCs. However, we were surprised to find that 30% of the students arrived with Apple computers and more than one fourth of the students accessed iTunes U through multiple devices (See Figure 1).
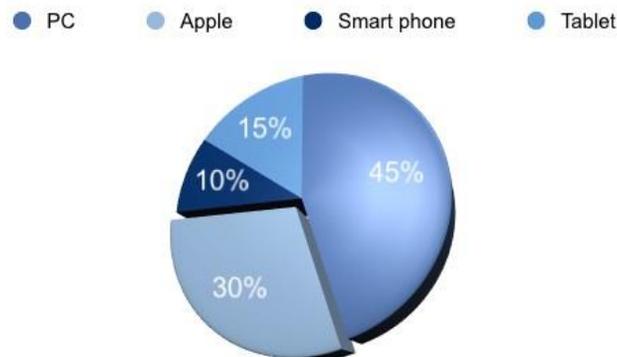

Figure 1. Students: PC, Apple, and Mobile Users

Student were given a wide range of media from audio files, to enhanced podcasts, to classroom video examples, to pdf downloads for class readings through iTunes U. Despite the variety of platforms students used to access the media, students found access to the classroom resources easy and efficient. Because over 75% of the students brought their laptop every day providing media assets through a single portable site helped them to have all that they needed wherever they went. Moreover, iTunes was an environment that 74% of the students were familiar with from buying music, podcasts, and television episodes prior to taking the course. As a result, the transition for the 68% of the students who had never encountered iTunes-U adapted relatively quickly to the new environment (See Figure 2).
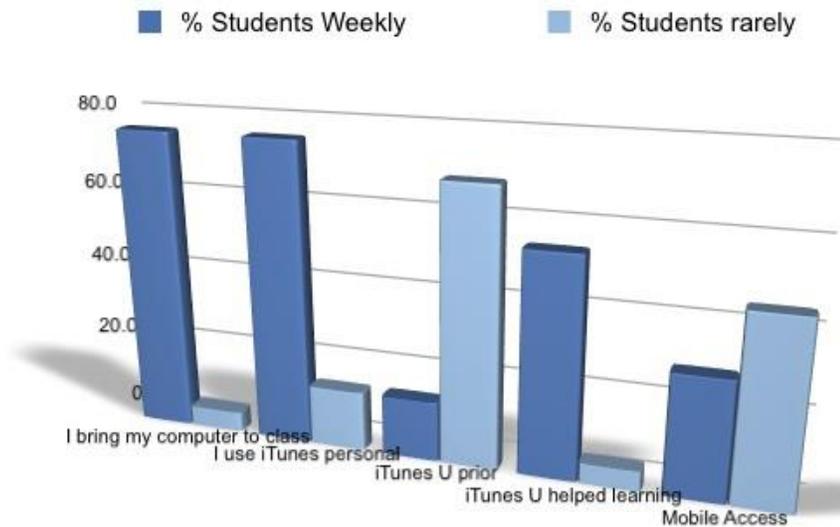
Figure 2. Student Familiarity with iTunes U

Instructors reported having a well-organized management system that maintained privacy of files behind the university's secure firewall or allows for public viewing. These settings were manageable by each instructor and customizable throughout the semester depending on the purpose of content dissemination. Students showed their preference for RSS content feeds as they reported,

> Adrian: "Getting content and resources from one location I am already familiar with is vital. Everyone uses iTunes."

> Melissa: " iTunes provided a single space where the media for the class (specifically, text and video files) were easy to find."

> Gilbert: "It provided an organization structure to my class and I loved the benefit of the RSS feed with the auto download."

Students had the ability to revisit content, provided in a variety of forms to improve learning. They also shared their work to iTunes U through uploads and dropboxes, allowing for collaboration with and feedback from peers.

> Sharon: "It definitely helped me feel more connected to the class. Allowed the sharing of student work, not just downloading and reading of what the professor puts there."

Students were given more than 2 gigabytes of educational resources which were synched and downloaded to their devices. Typically, this large amount of data would be slow to download through streaming media or direct download. With iTunes U, students were able to subscribe to the media feed and artifacts would show up in their iTunes U account. Once students had successfully navigate their account, content arrived automatically without Students found it a great advantage to carry around their media instead of having to be connected to a WiFi network or paying for minutes to stream media. For students to study

away from internet access it was simply a matter of remembering to synch their devices to their account.

The iTunes U environment seemed to be most helpful for students who had long commutes or who were primarily relying upon limited access to the campus resources. Students noted that they were able to make better use of their time through this class configuration and had better management throughout the rest of their lives to study, commute, and still meet the needs of their personal lives. Monica and Brit shared,

Monica: "I'm an adult doctoral student who has a full-time job, a family, and an incredibly full, and busy life. Without iTunes U, there is no way I could be as successful in this program as I am. iTunes UB allows me to complete assignments in a more timely manner by viewing all the course paperwork on line. I don't have to track down my classmates or my professor to see what is due or if they have an article, or to turn a paper in. If you want to reach out to non-traditional students wishing to advance their education, encourage your instructors to use iTunes UB! you are missing out on a huge pool of potential students."

Brit: Absolutely. I have a three hour round trip commute. That's three hours out of my day that was once wasted. With iTunes UB, I'm able to listen to texts and podcasts so as to make the most out of the very few hours that I actually have. I've been able to make the most of a 24 hour day.

Access to media and efficiency was only part of the story for these students. Students described a variety of other benefits from using the iTunes U environment. Among them were the elimination of specific plug ins or software for viewing artifacts, the organization of media, and the ability to view and review media including class readings on their mobile devices. With the explosion of apps for mobile devices, students with smart phones no longer needed to carry hard copies of readings along. They were able to access their readings from the course or their own university library. This amounted to specific cost savings for the student not having to buy large reading packets from the copy shops.

There were different kinds of benefits of using the iTunes U environment beyond the technical advantages. Students reported that their exposure to the variety of rich media that illustrated the course concepts in a variety of ways was helpful to their learning. Because iTunes U is used by a growing number of universities students also were exposed to what other universities were providing in different parts of the world regarding the same content area. More than 90% of the students favored seeing a wide variety of media rich assets as examples of content that they said helped them to learn better and added depth to their understanding (See Figure 3). As one example, Monica is an adjunct professor at a neighboring university working to complete her doctoral degree. When asked "What difference did iTunes U make in your learning?" Monica replied,

> "It's the difference between living what you learn and leaving what you learn. Because I am more proactive in my iTunes U courses, I retain more information. In courses in which I am more reactive, I tend to forget half of what I learn. iTunes U has enabled me to enrich my learning in such a way that I have become a better teacher and researcher.

Students reported many benefits from the use of iTunes U. The most prominently favored features included the ability for students to wide variety of examples, the additional depth of the course and class discussions provided through media resources and the connection to other iTunes Universities.
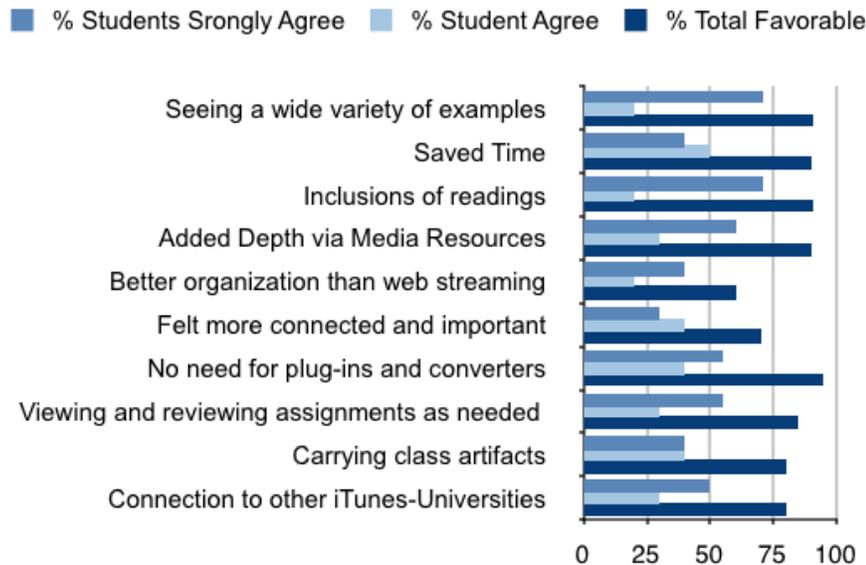

Figure 3. Reported Benefits of the iTunes U Environment

As teachers have limited opportunity to browse and find for themselves additional examples of non-traditional pedagogy, these educators were impacted by the variety of teaching strategies and venues provided by the instructors. Not only did students mention the ability to see examples of teaching through multimodal strategies, they also commented on their own varied learning styles that were met through the provision of rich media assets.

Tom: I am an audio learner and having the lectures available on iTunes U was very helpful. I could refer back to them and listen as many times as I needed to.

Brit: Part of this class was online and by listening to the lessons. I was able to understand the course materials better because of this option.

Eva: Every one has a different learning style. Videos may work better for the majority. We were able to access a variety of media to clarify concepts.

Students also rated the ease of use, the saving of time, and the organization of the assets that were provided through the iTunes U format. The ability to subscribe to media was actually novel to most of the students. This finding is similar to many other studies already mentioned in this article. The ease of subscribing, downloading, and carrying the media throughout the rest of their lives proved important to several students. Many reported

chaotic lives, vocations, and commutes. iTunes U turned out to help them better manage completing their assignments than the streaming options they faced in prior classes.

Monica: It was nice to listen to lessons via podcast on the go while driving to work. It helped with completing tasks

Sharon: For students that have jobs and other obligations using a mobile device and not having to be tied to the computer to listen to a lecture. By being mobile one can exercise, make dinner, or driving all while listening to a lesson.

Students also noted the lack of technology assistance they needed as no plug-ins or special extensions or applications were required and even relatively novice technology users could learn to navigate quickly through the rich media provided.

Eva: I think it can be helpful. It's easy to set up a subscription so new items automatically download for me to watch at my convenience. It was a little difficult to navigate to the first time I tried to use it, however.

Part of the assignments students were given included the creation of their own media assets, the posting of their artifacts, and the commenting on their peers' work. It was a specified goal of the course that students would comment on the work of others and iTunes U was one of the venues used in addition to BlackBoard. The students noted the bidirectional capabilities which allow students not only to subscribe and download media but also to upload media and to be notified of the work of others in the class.

Gilbert: Helped with dropping off assignments and checking to see if it was sent successfully. Allowed for easy sharing of my classmates work for collaboration.

Discussion

Overall, our experiment with iTunes U as a venue for content dissemination through RSS subscriptions was met with a favorable response. The majority of our students reported a positive experience using iTunes U for the first time as it offered many features that students felt better suited their needs as learners than the traditional teaching, discussion boards, and streaming offered in the past. Students appreciated the additional rich media provided and commented that they were able to use it at their own pace whenever they needed it.

Students' responses did not only focus on the technical aspects of their learning. They appreciated the efforts of the instructors to expand the walls of the classroom and access to excellent resources beyond the typical reading packets and course materials. This of course is not entirely related to the environment but rather is a fact of good teaching that was provided. No tool will improve teaching without the skills of the expert teacher to wield it in appropriate ways. One student summed it all up by saying,

Adrian: With the increase in multi-modal classrooms and digital technology in business, iTunes UB gives students a taste of what is going to happen in their future, this tool enhances learning by providing students with the chance to gain proficiency on using the computer in this manner. It also enables an instructor to provide students with a

forum to discuss classroom assignments and articles online outside of the classroom. Students are able to further their learning experience by using this tool to set up online study groups, an especially helpful source for busy, busy professionals/students.

However, with the positive response we have received, our university will be turning more of our attention to this environment as a means to supplement or replace existing learning environments on a per course basis.

Implications

Research has demonstrated that even when technology solutions like RSS feeds and iTunes U are made relatively easy and accessible, faculty are slow to take up new technology (Robson & Greensmith, 2009; Blin & Munro, 2008). We also found this to be the case as only a few instructors were willing to try iTunes U and even fewer willing to evaluate our first phase implementation. Though many instructors attended training, few organized their courses around a central RSS distribution. More traditional methods prevailed. In part this was due to the changing interface which occurred during the last public migration of content with iTunes U. The single user identity system which assured correct access for each user to their own content was difficult for instructors to keep up to date with. However, a more static interface would still likely not inspired many more instructors to utilize this tool.

We must look to other factors if we are going to use such a tool as RSS or iTunes U to promote changes in teaching. Future search must identify and ameliorate perceived obstacles to emergent technology, even if they are simply "perceived". Our next task will be turning or attention the kind of professional development for faculty to make our adoption more widespread. Substantial time and investment on behalf of the instructor is required to make such a transition if it will truly meet the expressed needs of our students. We are not ones to wholly embrace every technological advance as an improvement. We believe a more careful examination of specific tools for specific needs should be the focus of research and reporting on technology. However, with our specific results we have seen in our first phase of implementation, we see opportunity to provide more satisfying experiences for our students—particularly those who are attending with mobile devices to sync to our iTunes U site. We have demonstrated the proof of concept for our initial courses and, though iTunes U holds great potential, it is not clear how podcasts can be used more widely to impact practices and how sustainable and ubiquitous they may become to our learners. Our learners like many studies reveal do not regularly use RSS for learning purposes in any aspect of their lives. If we are to use RSS feeds in ways that leaders and reformers across the country recommend we will be,

> "enabling new channels of data exchange…RSS has the potential to create a stronger connection between knowledge creation with individual learning" (EDUCAUSE, 2007, p. 2).

We hope future research will paint fewer broad strokes upon the generic treatment of technology as innovation and focus more on the specific nature of the intervention and the nature of the expert teaching involved. In that way we believe that the use of future tools may intentionally result in better teaching. Though these questions remain unanswered, the use of iTunes U at our university is likely to grow.

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