人間科学研究　第20巻 第1号　11－18（2007）

短　　報

Use of iPods to support content area learning in a japanese college lecture course

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(Received：December 13, 2006；Accepted：February 23, 2007)

Abstract

A total of 600 students are enrolled in the recently created distance learning program at our university and the program will graduate its first class in the 2006 academic year. Although course content is primarily delivered through online streaming video, faculty members are seeking new methods to facilitate learning away from the computer using mobile technologies, such as iPod™ audio players. However, before initiating the widespread distribution of iPods to distance learning students throughout Japan, the authors conducted the present pilot study to better understand the logistics of such an undertaking, to determine if students would use such devices in a real educational setting, and to determine whether this technology can enhance their learning. Audio files of online lectures were loaded onto iPod audio players, which were distributed to undergraduates in a face-to-face version of the course. While statistical analysis of the impact of iPod use on content learning was inconclusive, qualitative data suggest that students used and valued the iPod as a learning30 tool.

Key Words：iPod, distance learning, mobile technology, higher education

Introduction

One of the fundamental challenges in education is delivering course content to the students, whether that is done through face-to-face (FTF) lectures or online (via streaming video lectures, for instance). Ideally, students should have the opportunity to review the lectures to increase their understanding of the contents. Distance learning students at our university's online degree program have a distinct advantage over their FTF learning counterparts as they have the ability to view their online lectures multiple times. Unfortunately, access to these online lectures is limited to broadband-equipped computers, partially for technical reasons, but also because of copyright concerns. Exploring mobile solutions for accessing securely accessing course contents — in this case, using iPod™ portable audio players — is one of the primary goals of the current project and is the topic of this paper.

American educators seem to have been the first to explore the use of iPods in higher education.

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In the spring of 2002, about one year after the iPod was first introduced, Georgia College & State University's (GCSU) Electronic Instructional Services (EIS) group launched their iPod Initiative with 50 5GB iPods distributed to 10 interdisciplinary groups who wrote proposals for using iPods in their courses (GCSU 2006; Apple Computer 2006). While the exact dates and nature of iPod integration are unclear, this program seems to be the first — or among the first — large-scale attempts to use iPods in higher education.

In 2004, Duke University initiated a massive effort to widen iPod access and use by issuing iPods to all incoming university students (Duke Magazine 2004). These devices were preloaded with orientation information and an academic calendar, but their use by students was left largely to individual need and creativity. As part of this initiative, numerous Duke faculty members have integrated iPod use into their curricula; according to the Duke Center for Instructional Technology (CIT), nearly 50 courses used iPods to some extent during the Spring 2006 term (Duke CIT 2006). However, little existing research on the use of mobile audio devices was available when this program was started (personal correspondence, November 4, 2005). While the use of these devices has increased, research on their use has remained undeveloped.

In April of 2005, Stanford University partnered with Apple Computer to make some of its educational content available through the iTunes Music Store™ in a program called“iTunes U™” (Apple Education Solutions 2006). This effort was significant because of its ability to allow students to download and maintain the content of their iPod using secure servers. This also enabled the university to control access to its intellectual property (or widen it as some content is available for downloading by the general public (Stanford on iTunes U, 2006). Similar to Duke University's faculty, Stanford professors are making efforts to integrate iPods and Podcasting into their courses. Despite this active use of mobile audio devices, little or no research is available on these efforts.

This paper describes the authors' preliminary efforts to incorporate iPods into lecture courses at a Japanese university in the fall semester of 2005. In order to better understand the potential of iPods to support learning, we decided to focus on the logistical, educational, and technological challenges to using iPods in class: Face-to-face at first, then moving to distance learning students. In addition, we wanted to gauge student reaction to using these devices: Would they use the iPods to review course content, and if so, would this use be helpful to their understanding of the content? This paper describes our initial attempt to deliver educational support materials using iPod audio players.

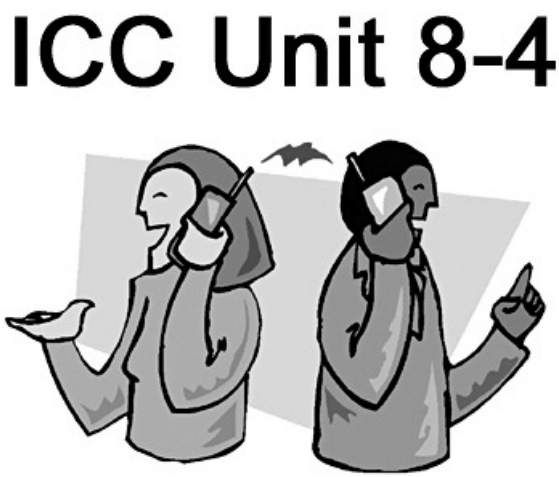
Method

This study was conducted in the context of a FTF lecture course at a Japanese university. Six participants (five women and one man) were selected from a pool of volunteers of Japanese undergraduate students enrolled in a FTF, bilingual (English and Japanese) Intercultural Communication class that is taught annually in our department. The participants included three first-year students, two third-year students, and one fourth-year student. Only the male participant owned an iPod prior to the start of the study. All participants completed the five-

week study which involved attending the FTF lectures and listening to audio versions of the lectures on an iPod (detailed below).

The audio lectures used in this study were copied from the online videos used for the e-School version of the course. The e-School is our university's online degree program with nearly 600 students. Most course content is delivered through streaming video lectures, supplemented with online discussions, essays, tests, and in the case of certain courses (e.g. physical education) FTF schooling. Videotaped lectures of the e-School's "Intercultural Communication" course were used to create audio files for this study. These audio files were loaded onto six iPod audio players (four iPod minis and two iPod nanos). These machines were chosen for their integration with the iTunes application, their ability to work with PCs and Macintosh computers, and their general familiarity among the students. Audio files were used because at the time this study was conceived, video-capable iPods had not been announced.

All participants were assigned one iPod audio player for use in the study. Students were given a brief tutorial on how to use the players, and were instructed to use the players as often as possible during the course of the study. Each participant had access to the iPod lectures for four weeks covering Units 5–8 of the course, although some participants also listened to Unit 9 which coincided with the day of the post-test.



Simple artwork was included with each file for convenience and clarity.

Data collected included play counts (to monitor the students' use of the lectures), pre- and post-tests of content knowledge, and post-study questionnaires that included 5-point Likert scale (to determine students' impressions of FTF and iPod lectures) and open-ended comments. The results of these data are presented below.

As noted above, the audio files were created from the online course's streaming video lectures and used by student volunteers in the FTF course following an identical curriculum. While focusing on distance learning students for this study would have been ideal, relying on FTF students eased a number of logistical concerns including security of the lecture contents, trouble-

shooting potential software or hardware problems, and the distribution and later collection of the iPods themselves. While this solution was sufficient for a pilot study, the logistical problems noted above will have to be addressed when transitioning the use of these technologies in a distributed learning environment.

Results & Discussion

Course Feedback

All students taking this course were asked to complete a short survey of their impressions of the course and the use of technological tools to support learning. The pre- and post-study questionnaire results are presented in Tables 1 and 2. Data included in these tables is from the six study participants (Table 1) and 20 non-participants who completed both the pre- and post-study questionnaires (Table 2).

Table 1 ：iPod Study Participants' Questionnaire Results

	Course content is difficult	Bilingual explanations help	PowerPoint slides help	Outside review helps	I'm doing well in class	Increased interest in course content
PRE	2.67	2.83	4.5	4.17	3.67	4.00
POST	2.83	3.33	4.83	4.33	3.83	4.67
	+0.16	+0.50	+0.33	+0.16	+0.16	+0.67

"Strongly disagree" = 1, "Strongly agree" = 5

Table 2 ：non-iPod Study Participants' Questionnaire Results

	Course content is difficult	Bilingual explanations help	PowerPoint slides help	Outside review helps	I'm doing well in class	Increased interest in course content
PRE	2.64	3.28	4.44	3.88	3.44	4.44
POST	3.00	4.00	4.50	4.00	3.19	4.44
	+0.36	+0.72	+0.06	+0.12	-0.25	0.00

"Strongly disagree" = 1, "Strongly agree" = 5

Several noteworthy points can be found in these data. Initially, the iPod users' interest in the course content was relatively high to begin with, and over the course of the study, they expressed increased interest in the course content. This increase compares favorably with the non-iPod users whose interest in course content was unchanged. In addition, the study participants' rate of increase was the highest of any of the categories for the iPod user group, and second highest rate of increase for both groups. This point become more salient below when the participants' overall impressions of iPod use are detailed. Briefly, despite overall tepid interest in using iPod for academic purposes, iPod use in this case seems to have increased the participants' interest in the course content.

Secondly, the iPod users stated that PowerPoint slides were useful in understanding course content. Their responses were much higher than the non-iPod user group. This may indicate that while the audio-only iPod-based lectures were somewhat difficult to follow, a video-

equipped iPod would be more useful for these students. Finally, while both groups began at roughly the same point, more non-iPod users rated the course content as difficult at the end of the study period than iPod users.

Comparing FTF and iPod Lectures

In addition to the previous set of questions, at the end of the study, study participants were asked a number of questions about their impressions of the FTF and iPod lectures. The participants rated their experiences on a five-point scale with 1 being "strongly disagree" and 5 being "strongly agree." The resulting averages are summarized in Table 3:

Table 3 : Participants' impressions of FTF and iPod-based lectures

	FTF	iPod
1. The lectures were easy to understand.	4.5	3.3
2. The lectures were interesting.	4.2	3.7
3. Lecture presentation was easy to listen to (talking speed, volume, etc.)	4.5	2.8
4. I understood the lectures' contents.	4.0	3.8
5. Listening to the iPod lectures helped me better understand the class contents.	---	4.2
6. In general, the lectures were good.	4.5	3.7
7. I prefer the face-to-face lectures to the iPod lectures.	4.7	---
8. I prefer the iPod lectures to the face-to-face lectures.	---	2.3
9. I prefer using both the iPod lectures AND the face-to-face lectures.	3.7	

For all items on the table, the FTF lectures were rated more highly than the iPod-based audio lectures. Notable are items 1 (lectures were easy to understand), 3 (lectures were easy to listen to), 6 (lectures were good), and 7 (prefer FTF lectures). The greatest differences with the iPod lectures can be found in items 1 and 3, strongly indicating that the iPod-based audio lectures were challenging for these non-native English speaking students.

While the iPod lectures seem to fair poorly compared with traditional FTF lectures, one item (#5) stands out: As a group, the students agree that listening to the iPod lectures helped them better understand the course contents. This result is interesting since, as compared to the FTF lectures, the iPod lectures were not as easy to understand, not as interesting, harder to listen to, and generally not as good. This result reminds us not to evaluate the iPod lectures' results too harshly. While the audio-only lectures were rated lower than their traditional FTF counterparts, the results are still generally positive and encouraging. As a group, students only disagreed with two points (items 3 and 8), the first was only by a small margin, and the second is a reasonable result given the state of the art of the technologies used. For the other five items, the

participants' average was shaded to the “agree” side which is reasonable for this initial study.

Participant Comments

Part of the post-study questionnaire was an open-ended comments section. Some of the participating students wrote comments that helps shed light on the nature of their use of these technologies. For instance, first year student wrote that for her, it's easier to understand the FTF lectures because of the simultaneous audio and visual input (e.g. slides, pictures, etc.). Combined, she notes, this multimedia approach helps her remember the lecture contents. A third year student wrote that she prefers the FTF lectures not only because of the PowerPoint slides, but also the lecturer's expressions and movements. She further explains her preference for visual information when she says that “if I was at home, I would prefer video of visuals rather than just voice.” Taken together, these comments indicate that the positive aspects of the FTF lectures may not be in the physical environment or social milieu. Indeed, they indicate that visual input (be it gestures, images, or slides) enhance the learning experience. It seems reasonable that these visual cues could be supplied by electronic means in an asynchronous format (i.e. streaming video or iPod with video).

The participants' comments about the iPod lectures were more wide ranging. The first student quoted above, when commenting on the iPod-based lectures, noted that they were hard to understand because of technical issues, like the distance between the professor and the microphone. The second student quoted above indicated that for her, it was a challenge to concentrate while listening to the audio lectures on the train. The sole male participant noted that using the iPod helped him understand the class little by little. Finally, another third year students wrote that she enjoyed listening to the iPod lectures early on, but “I started to become lazy and I don't listen to it that often anymore.”

Issues raised in the comments' section are instructive and point out some of the challenges to using mobile technologies: Technical quality of the audio and (in the future) video contents, overcoming distractions in the environment when outside of a traditional classroom, and the ability of students to persevere in their independent studies. Arguably, these issues may be felt more strongly by traditional undergraduate studying in a FTF environment than by distance learning students who tend to be more experienced with independent, electronic-media based, learning.

Conclusions

The current pilot study was an attempt by the authors to better understand the logistics of using iPods in higher education and to gauge student response to using these devices in a real classroom setting. Certainly, giving away (or loaning) iPods to students for free will be met with a positive response, but will the students actually use these devices for educational purposes, and if so, will they value this use as meaningful to their education?

This study included six participants which was too small of a sample to facilitate meaningful quantitative analyses. However, this was a manageable size for a preliminary study, allowing the researchers to content with such challenges as the distribution (and later collection) of iPod

music players, management of the course contents, and maintenance of the audio players. Second only to the cost of purchasing the iPods, the challenge of preparing and maintaining the iPods was particularly time-consuming. More experience should decrease the time needed to prepare and maintain these devices, and in the medium-term as copyright and electronic distribution issues are overcome, the process could be transferred completely to the students allowing for a larger number of students to participate.

While the results of this study were inconclusive, several key points came out through this experience that have already been put into practice is the second phase of this research project. One, our focus on content yielded limited results due in large part to the high pre- and post-test performance of the experimental group. Second, failing to collect data on the students' language ability (especially the control group) limited our ability to evaluate the possible effects of audio player use.

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Note : This paper was originally presented as a full paper at *E-Learn 2006 : World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education* in Honolulu, HI.

人間科学研究　Vol. 20, No. 1 （2007）

日本の大学の講義科目におけるiPodの活用

スコット ダグラス，西村　昭治，加藤　尚吾

抄　録

早稲田大学人間科学部の通信教育課程ｅスクールは、2006年度600名の学生が在籍しており、2006年度に最初の卒業生を出すことになる。ｅスクールは、オンラインのストリーミングビデオで講義を配信している。したがって、学生は、コンピュータの前で受講することになる。本研究は、学生がどこでも受講可能になるよう、モバイル機器であるアップル社のiPodを、異文化間コミュニケーションの科目で活用した。実際に、オンライン講義のオーディオファイルをiPodに取り込み、学生にそのiPodを配布し、その効果を検討した。定性的評価の結果、学生は、学習の道具としてiPodを使用することの価値を認めていることが示唆された。

キーワード：iPod, 遠隔教育, モバイル技術, 高等教育