



Summary

As part of a university initiative to encourage creative uses of technology in education and campus life, Duke distributed 20GB Apple® iPod devices, each equipped with Belkin® Voice Recorders, to over 1600 entering first-year students in August 2004.

The Center for Instructional Technology (CIT) coordinated an evaluation of the academic use of iPods, drawing on course-level feedback; student and faculty focus groups; a broad survey of first-year students and faculty; and discussions and feedback among staff, administrators and important campus stakeholder groups. This evaluation focused on the feasibility and effectiveness of the iPod as a tool for faculty and student academic use. The primary purpose of this evaluation was to assist project stakeholders and Duke decision-makers in determining what iPod uses were most fruitful and to help shape future Duke academic technology initiatives. This report summarizes the main findings of this collaborative assessment effort.

Evaluation Findings

At least 15 fall courses with a total enrollment of 628 unique students and an estimated 33 spring courses with a total enrollment of over 600 students incorporated iPod use (for brief descriptions of select courses and links to available in-depth course profiles, see Academic iPod Projects, page 13). As expected, foreign language and music courses integrated the device, but its use also extended to other social science and humanities courses. In addition, all first-year engineering students used the iPod in their required Computational Methods course. Audio-intensive courses reported that the iPod increased the frequency and depth of student interaction with audio course content through portable and flexible access offered by the iPod. Initial planning for academic iPod use focused on audio playback; however, digital recording capabilities ultimately generated the highest level of student and faculty interest. Recording was the most widely used feature for academic purposes, with 60% of first-year students reporting using the iPod's recording ability for academic purposes. This high level of interest in digital recording was also reflected in the proposals CIT received and supported. The iPod's music database and hard drive storage capabilities were also widely used by first-year students in academic contexts, although this use was less extensive than recording (28% vs. 60% of first-year students).

Academic uses of iPod

The academic uses of iPod devices by faculty at Duke fell into five major categories.

- **Course content dissemination tool** - Portable access to course content such as lectures, songs, historical speeches, and foreign language content distributed via the Duke iPod content server, iTunes Music Store, Blackboard course management tool, and podcasts
- **Classroom recording tool** - Capturing lectures, class discussions and verbal feedback
- **Field recording tool** - Capturing field notes, interviews, environmental sounds and audio data
- **Study support tool** - Repeated listening and repetition of commercial and original audio content, such as music, audiobooks, rehearsals and vocabulary lists

- **File storage and transfer** - Simple transfer or backup mechanism, particularly for large multimedia files

Based on class observations, student and faculty focus groups, and course level and broad surveys of students, benefits and limitations of academic iPod use were identified as follows:

Benefits of academic iPod use

- Convenience for both faculty and students of portable digital course content, and reduced dependence on physical materials
- Flexible location-independent access to digital multimedia course materials, including reduced dependence on lab or library locations and hours
- Effective and easy-to-use tool for digital recording of interviews, field notes, small group discussions, and self-recording of oral assignments
- Greater student engagement and interest in class discussions, labs, field research, and independent projects
- Enhanced support for individual learning preferences and needs

In addition, it is important to note that the mass hardware distribution created a low barrier for participation in instructional technology experimentation, particularly for faculty with many first-year students in their courses. As a result, CIT supported several successful projects with faculty who had previously not been involved in other instructional technology initiatives. Innovation and experimentation for academic iPod use was widely reported as well, with 75% of first-year students reporting having used at least one iPod feature in a class or for independent support of their studies.

Barriers to and problems encountered with academic iPod use

Integrating iPod use into the academic technology enterprise at Duke presented a number of substantial challenges. Despite a significant investment of staff time and resources, a number of barriers remained, and some areas were identified where the iPod was a less than ideal match for faculty and student needs:

- Significant challenges in integrating multiple systems for content storage, access, sharing and distribution with one another and with existing technology infrastructure
- Absence of systems for bulk purchase or licensing of commercial *.mp3* audio content for academic use
- Difficulties in locating commercial sources and obtaining licenses for content from independent and international publishers in appropriate formats
- Inherent limitations of the device (e.g., no mechanism for input other than synchronization, lack of instructor tools for combining text and audio)
- Limited pre-existing documentation and training resources, particularly for PC users and for academic uses
- Recordings made on the iPod were not of sufficient quality for use in some academic contexts
- Lack of awareness or accurate knowledge of iPod functionality and academic applications among faculty and students

Institutional impacts of the iPod project

In addition to the findings outlined above regarding academic iPod use, the evaluation also identified four significant institutional impacts of the project:

- Increased collaboration and communication among campus technology support groups highlighted strengths and gaps in the existing technology environment and was an impetus for broader planning and improvement of infrastructure and services
- Significant and unanticipated publicity generated by the project yielded many contacts, partnerships, and nascent collaborations with other higher education institutions, publishers, and hardware and software vendors
- The project catalyzed conversations among faculty, administrators, staff, and students about the best role for technology in teaching and clarified needs and interests of faculty in this regard, with one result being the current 2005-2006 Duke Digital Initiative continuing iPod use as well as incorporating other technologies for digital images, video, and collaboration
- Increased visibility for Duke's institutional commitment to technology and greater engagement by Duke in inter-institutional collaborations around instructional technology, such as the Apple Digital Campus collaboration with Stanford University, The Ohio State University, Pennsylvania State University, and the Missouri School of Journalism

Next steps: The Duke Digital Initiative

The Duke Digital Initiative for 2005-2006 has been largely shaped by the experiences of the iPod initiative, lessons learned, and the conversations that resulted among faculty, staff, and administrators. In particular, this initiative is intended to build on successes with digital audio from the 2004-2005 iPod project, but also seeks to provide support for additional innovation with digital images, digital video, tablet PCs, and collaboration technologies. For more details on the Duke Digital Initiative, see <http://www.duke.edu/ipod/about/faculty.html>.

Yvonne Belanger, Program Evaluator
Center for Instructional Technology
Duke University

Media inquiries about this report should be directed to:

David Menzies
OIT News and Information
Duke University
919-684-2151

Project history and implementation

The iPod project was sponsored by the Office of the Provost and Office of the Executive Vice President, the Center for Instructional Technology (CIT), the Division of Student Affairs, the Office of Information Technology (OIT), and Apple Computer. The project also involved the efforts of many other campus units including Arts and Sciences Information Science and Technology (A&SIST), the DukeCard Office, Duke Stores, and Duke News and Communications. Using funds specifically earmarked for technology initiatives, the total cost of the project was budgeted at \$500,000, including an academic computing specialist in multimedia specifically hired for the project, internal grant funding to support faculty course projects, and the purchase of the iPods, iPod accessories, and other related equipment.

After the final decision to proceed with the iPod distribution was made in May 2004, the Center for Instructional Technology worked over the summer to recruit faculty to participate in the project in fall 2004. Most faculty learned about the project in July when the project was first publicly announced. In addition, CIT issued a broad call for proposals from faculty in August and accepted proposals for fall academic iPod projects on a rolling basis; CIT also accepted proposals for spring semester projects until February 15, 2005. CIT received over 30 proposals and numerous faculty inquiries about project participation. CIT ultimately 27 complete proposals were feasible and selected these to support.

In addition to the iPod devices purchased for distribution to first-year students, an additional 150 iPods were initially obtained to support faculty as well as non-first-year students in supported courses. The high level of faculty interest and limited number of first-year only courses led to increased need for loaner devices. By the end of spring 2005, CIT was supporting a loaner pool of at least 225 iPod devices, with this number including some devices that have been permanently issued to faculty and staff. Distribution and maintenance of this loaner pool of equipment was challenging, requiring significant staff effort.

OIT developed a system to enable first-year students or upperclassmen without their own computers to use lab computers to synchronize content with an iPod using special 20 gigabyte server accounts. According to OIT, at least 41 students took advantage of this offer initially, although only about 30% of these accounts have seen continued activity, with 3 GB reported as the maximum amount of individual server space used.

Project Evaluation Process

Project evaluation activities took place throughout the fall and spring semesters. Focus group interviews were conducted with all faculty participating in sponsored projects as well as with three groups of students in iPod courses. CIT staff conducted over twenty structured observations of classes using the iPod. In addition, individual faculty evaluated their project success using feedback questionnaires tailored to the objectives of the individual course project, weekly logs, reflective essay assignments, and student "blogs" about course iPod use. A Web-based questionnaire regarding use of iPods in academic and student life contexts was distributed to

approximately 1650 first-year students in February 2005. A large number of students responded, but the overall response rate from first-year students was low (28%, n=450); to ensure that the original sample was representative of the first-year students, telephone interviews were conducted with a random sample of 27 nonrespondents in April 2005. Findings reported here represent a synthesis of information from all of these sources and methods. CIT also surveyed all fall 2005 instructors of first-year students. Although this survey yielded valuable qualitative information, the response rate was very low (13%, n=58), and difficulties in contacting faculty for follow-up interviews prevented the validation of quantitative information from that survey.

Academic uses of iPod: Detailed Findings

Course content dissemination using iPod

Many courses previously using physical or streaming media to deliver digital audio content experimented with iPod delivery of this content. Digital audio files in .wav, .mp3, and other formats were found to be a convenient and portable way to distribute course learning materials. At least 11 courses explored the alternative use of the iPod to allow students more flexible access to digital audio course content. Commercial and noncommercial audio for the iPod was disseminated throughout the fall and spring semesters using a variety of mechanisms, including Duke's homegrown iPod content server, iTunes, podcasts, and the Blackboard course management system at Duke. Initial project plans had called for students to be able to download course content such as language lessons, music, and recorded lectures from a Duke Page on iTunes. However, iTunes was not able to support direct faculty uploading of materials or provide course-level authenticated access, so Duke developed an alternative internal solution called the iPod content server. During the spring semester, some courses also began to experiment with podcasting as a means for disseminating digital audio content.

The Apple iTunes online Music Store was a source of commercial content for some courses. Some faculty were able to find useful content for their courses in the Music Store; however, faculty were typically not able to locate all desired commercial music content for their courses through iTunes. Efforts to have additional content added to the iTunes Music Store in response to faculty requests were not successful. Those faculty who were able to use iTunes content selected individual tracks for students or created customized playlists or "iMixes" to simplify the purchase of content. Based on the number of songs required per student, CIT provided song codes or gift certificates via email to individual students enrolled in supported iPod courses. From both administrative and student perspectives, the use of song codes to purchase academic content in iTunes was inefficient. Anecdotal evidence indicated that gift certificates were more convenient for students. As a result, for support of three spring 2005 courses, CIT provided gift certificates rather than song codes to students in order to simplify project support as well as the purchasing process for students.

Some faculty were able to obtain copyright permissions to load commercial audio (e.g. packaged textbook audio) onto student iPod devices. Due to a lack of software or other tools for loading groups of iPods with similar content for student use, this process was manual and tedious.

In addition, some publishers were unwilling to extend existing licensing agreements for streaming academic content to permit loading potentially reproducible digital files onto a student iPod, given that no mechanism existed for ensuring that the content would expire at the conclusion of the associated course.

Course applications

This table illustrates courses which disseminated digital audio content for the iPod:

<i>iTunes</i>	<i>Podcasting</i>	<i>Content Server, Blackboard, other</i>
English 26S	Info Science / Info Studies 140	English 26S
Music 128S	Info Science / Info Studies 270	German 115S
Spanish 1, 2, 14	Theater Studies 129S	Spanish 1, 2, 14
Music 65		Theater Studies 129S
Music 70		Turkish 70

Findings

- Students in courses with listening comprehension requirements (e.g., foreign language and music) reported that access to portable digital audio course content was particularly valuable
- Benefits cited by students included support for multitasking, advantages in replaying conceptually difficult lectures, and benefits to non-native speakers in replaying lectures
- Students reported being more likely to use pre-loaded content than content that they needed to obtain and load themselves
- Students frequently reported that the process of purchasing course content in iTunes using song codes was cumbersome. Based on reports from Apple, only 51% of approximately 750 song codes specifically distributed to three CIT-supported courses in fall 2004 were redeemed.

Recording in the Classroom with the iPod: Capturing Lectures, Discussions, and Verbal Feedback

With the addition of a recording accessory, the iPod becomes a portable digital audio recorder. The small and unobtrusive accessory (along with an optional lavalier or external microphone) was used to capture various types of classroom audio. Students and faculty recorded lectures and discussions to emphasize listening and participation. Students also used class recordings made by instructors and fellow students to review for exams or to make up missed classes. The iPod also allowed instructors and students to record and share verbal feedback on essays and other assignments. Both faculty and students expressed a high level of interest in recording lectures. A search for better quality recordings of lectures (particularly for large classes) and easy authenticated distribution systems led to a pilot test of the iLecture system for lecture recording (<http://cit.duke.edu/about/ilecture.do>) beginning in spring 2005 and continuing into fall 2005.

Although some data were gathered to support the value of recording lectures, the extent to which having access to lecture recordings improves student performance, impacts class attendance, or enhances students' course experiences remains unknown. Anecdotal evidence from some projects indicated that access to recorded lectures may have positively impacted student exam performance. Attempts to rigorously measure the usefulness and educational effectiveness of

providing recorded lectures to students were confounded by technical issues such as the poor recording quality and limitations of systems for tracking student use of recorded lectures.

Course applications

The following courses used the iPod directly to record lectures and classroom interactions:

- Economics 1, 51, 110
- Education 170S
- Info Science / Info Studies 100, 140, 270
- Music 65, 70
- Religion 20S
- Spanish 1, 2, 14
- Theater Studies 129S
- Turkish 70
- University Writing Program; Writing 20

Findings

- Faculty and students found the iPod a convenient tool for capturing lectures and classroom interactions
- The iPod was most useful for recording at short distances and in small groups, particularly in peer-to-peer interactions, faculty-to-student interactions, and other small group settings
- The low sample rate (8 kHz), limited useful distance for recording, and large size of recorded files produced made the iPod and existing recording accessories a less than ideal solution for some classroom recording applications
- Many students and faculty expressed concerns about potential impacts on class attendance, although further research is needed to support or refute this concern

Student feedback

Recorded lectures

"I loved being able to listen to the lectures at my convenience, to be able to listen to difficult portions several times, and just hear the material again-while working out, or running other errands-and I think the value of listening to the lectures showed through with a high score on the first exam."

"...this encourages students to sleep through class (whether they sleep in the lecture or just stay in bed)!!!! it gives the message that coming to lecture or paying attention is not important because everything will be online later anyway."

"I really like the idea. It allows me to add on to my notes because sometimes you just miss things the first time around. This allows you to pause the lecture if you need to in order to write down detailed notes."

Other classroom interactions

"It was great. I didn't have to write down all the comments my group said about my paper because I could just download it off of my iPod onto my iTunes and listen to it from there. I write very slowly, so it helped me so that I wouldn't miss a thing."

**Recording Outside of the Classroom With iPods:
Interviews, Field Notes, and Sound and Audio Data Collection**

Students in several courses enhanced their empirical research by using the iPod to collect information outside of class, including recorded interviews, personal field notes, environmental sounds, and biometric data. In addition, students in some courses used iPod recordings of performances and environmental sounds to produce artistic projects such as radio plays and audio expressions of emotion or mood. Some faculty used the iPod as a substitute piece of equipment for activities where they had formerly used analog tape recorders or other digital recorders. Other faculty integrated entirely new field recording activities into their courses that they would otherwise not have included, had the iPod not been available.

Course applications

A variety of courses in a diverse range of disciplines used the iPod for field recording applications:

Interviews and field notes	Sounds & audio data
Cultural Anthropology 194 Education 152S Environment 181 German 115S Info Science / Info Studies 270 Music 137 / Cultural Anthropology 145 Public Policy 120 Writing 20/24	Asian / African Lang & Lit 49S Electrical / Computer Engineering 180 Music 70

Findings

- Students found the iPod easy to use and reliable for capturing field recordings at short distances (in-person or on speaker phone interviews, for field notes, oral assignments, etc.)
- Most students reported that interview/field projects enhanced their course experiences, with several citing these projects as the most rewarding portion of the course
- Even after receiving training, many students reported difficulties moving recordings from the iPod to their computer (particularly PC users)
- Faculty and students also required training on audio editing software and generally found the preferred software (Audacity) relatively easy to use; some students circumvented the iPod and used Audacity for recording as well
- Students and faculty who received hands-on training for moving sound files and using audio editing software reported fewer problems than those who received demonstration-only training

Student comments

“I think the iPods were an excellent addition to the course...[they] gave us a lot of freedom in terms of recording. It was great to have such an easy to use and reliable recording device. It was also great that we all had the same format sound files and everything seemed to work smoothly and well. I really didn't hear of any iPod recording disasters or sound file issues, beyond a few minor iPod to PC transfer issues. I really enjoyed having the iPod and it was great to pull it out and listen to the interviews whenever I needed to in order write my essay.”

“The ipods were useful in collecting interviews, although this ability is not unique to an ipod.”

“Recording oral exercises was easier with the iPod because we would not have to make a trip to the Language Lab.”

iPod as a Study Support Tool

In languages, music, and other subjects and contexts with listening comprehension or performance-based components, practice and repetition was facilitated through digital audio files. Some instructors and students created recordings of vocabulary lists with spoken definitions of terms for review. Instructors use the “playlist” feature of the iPod to provide students with groupings of review materials—by unit, week, concept, etc. Students reported loading the iPod with songs and albums of course music tracks that they listened to repeatedly in preparation for music listening tests. Others reported recording their own private lessons or performances (oral, vocal, theatrical, or instrumental) and used the iPod as a tool for self-reflection, analysis, and improvement.

Course applications

- Economics 1, 51D
- Spanish 1, 2, 14
- Music 65, 70
- Theater Studies 129S
- Turkish 70

Findings

- The iPod's portability and its capacity to easily and quickly cue up specific files made it an effective study support tool for students
- Students often reported finding the iPod useful for studying in cases where the instructor did not specifically encourage its use or directly provide digital course content

- Faculty and students indicated that the iPod would be more useful as a study tool given access to software tools enabling them to synchronize audio files with images, or improved search and retrieval tools for audio

Student comments

"I used my iPod's iTalk feature to read through key points in notes and then listen back. For example, while cleaning my room, ironing, or doing something that does not require 'thinking,' I would play back my recorded notes and listen."

"I used my ipod to listen to music for my chamber music class. The teacher didn't recommend or provide the music. I found it myself and utilized it myself."

"I love my iPod. I had a music seminar... and had to memorize various symphonies and concertos for a listening final. My prof had no idea what an ipod was but I used it everyday until I learned all of the listed recordings."

Storing and Transferring Files using iPod

The iPod's portability and fast data transfer rate via USB or FireWire provided a convenient mechanism for storing and transferring up to 20 GB of data. As a portable hard drive, the iPod allowed students to back up important files and move large files more easily from one computer to another. Students carried their working files from their own computers to their labs and classrooms, and vice versa.

Course applications

- Info Science/Info Studies 100, 140
- Music 65
- Electrical / Computer Engineering 180
- Engineering 53
- Music 70

Findings

- Use of the iPod as a hard drive was less widespread than the recording feature, with 27% of first-year students reporting use of this feature for academic purposes
- Many students and faculty reported being unaware of the iPod's potential use as a portable hard drive

Student comments

"The most useful aspects of the iPod include recording for foreign language audio notecards, actual notecards...using wordpad and the 'notes' function, and, above all, for its use as an external hard drive."

“The iPods on a personal level (storing and transferring files, music, etc.) have been incredibly useful machines. I have used it academically to record lectures as well as record my violin lessons...”

Institutional impacts of the iPod project

In addition to the findings regarding academic iPod use, the evaluation also identified four significant impacts of the project on an institutional level:

- **Increased collaboration and communication among campus technology support groups**

The short span of time between the final decision to proceed with the project in spring 2004 and the iPod distribution to first-year students in August 2004 presented significant challenges in coordination among a wide array of campus units and services, particularly for direct project support of participating faculty. However, one immediate result of the project was an increase in the frequency and intensity of communication among technology infrastructure planning groups and academic technology support groups. In effect, this project effectively “stress-tested” Duke’s technology infrastructure and services, revealing several ways in which these resources performed better and worse than expected. Campus technology infrastructure planning groups now have access to better information for considering upgrades to classroom technology systems, implementation of mass network storage, integration of single sign-on and authentication systems, development of a library information commons, and other university technology infrastructure issues and projects.

- **Significant unanticipated publicity**

Partly due to the cultural phenomenon of iPod use, the significant interest within the higher education community about the project was accompanied by interest from local, regional, national, and even international media outlets. The Center for Instructional Technology and other visible units involved in the project received hundreds of unsolicited inquiries and invitations for collaborations. Although this unexpected publicity was at times a burden on staff, this heightened visibility and level of interest yielded many contacts, potential partnerships and nascent collaborations with other higher education institutions, publishers, and hardware and software vendors.

- **Catalyzing conversations about the best role for technology in teaching**

Use of the iPod has enabled faculty to simplify course delivery and, in some cases, to improve course design and enhance course content. Many faculty involved in the iPod project had not previously considered the use of this type of technology for their courses. Other faculty whose needs for technology to support or enhance their teaching have not been met by this initiative have more clearly articulated their needs through many discussions across campus.

- **Increased visibility for Duke's institutional commitment to technology and greater engagement by Duke in inter-institutional collaborations around instructional technology**

Feedback from colleagues at peer institutions indicated that the project had impacted the perception of Duke as an innovator with technology. In addition, Duke, along with four other higher education institutions participated in the Apple Digital Campus project. Along with these other institutions, Duke is helping to develop models for introducing and merging pervasive computing into campus environments.

Academic iPod Projects Fall 2004 - Spring 2005*

Note: Due to cross listing, three courses appear listed under more than one subject and course number.

Fall 2004	Spring 2005
1. Chinese 1**	1. Asian / African Lang & Lit 49s
2. Economics 1	2. Cultural Anthropology 145b
3. Economics 110 **	3. Cultural Anthropology 194
4. Electrical/Computer Engineering 180	4. Economics 51
5. Engineering 53	5. Education 152s
6. Environment 181	6. Education 170s
7. German 115s	7. Engineering 53
8. Info Science/Info Studies 100	8. English 26s
9. Music 49s**	9. Info Science/Info Studies 140
10. Music 65	10. Info Science/Info Studies 270
11. Music 70	11. Literature 132
12. Spanish 14	12. Literature 262
13. Writing 20/ 24	13. Music 120
14. Writing 20/20**	14. Music 128**
15. Writing 20/21**	15. Music 137
16. Writing 20/ 60**	16. Philosophy 270
	17. Public Policy 120s
	18. Religion 20s
	19. Spanish 1
	20. Spanish 2
	21. Theater Studies 129s
	22. Turkish 70
	23-33. ***

** Projects not directly supported by CIT

*** Based on anecdotal reports and projections from CIT, an additional 10 courses are estimated to have incorporated the iPod in the spring 2005 semester.

Project Descriptions for CIT Supported iPod Projects**ASIAN / AFRICAN LANG & LIT 49S**

Students recorded natural sounds in various cultural environments to help examine subjective experience as well as ideas about mysticism and human potential.

CULTURAL ANTH 194

Students recorded interviews with individuals in various cultural contexts to examine the cultural significance of community interactions.

ECONOMICS 1, 51D

The instructor captured her Economics lectures with her iPod and made recordings available for download and review before exams throughout the semester.

Course profile: <http://cit.duke.edu/ideas/newprofiles/leachman.do>

* Three courses are represented in this list by more than one course department and number due to cross listings. Additional courses where faculty and students independently used iPods without CIT support may have been inadvertently omitted from this list, particularly in the case of spring course use.

EDUCATION 152S

Students recorded interviews with Durham community centers, schools, and non-profits and used recordings as material for a research essay about community partners' assets and challenges.

EDUCATION 170S

Students recorded tutoring sessions they observed and used recordings in class discussions to review and evaluate strategies. Students also recorded their own tutoring sessions for self-review.

ELECTRICAL / COMPUTER ENGINEERING 180

Students used iPods to record pulse rate data during physical activity, as well as environmental sounds, and used recordings to study digital signal concepts.

Course profile: <http://cit.duke.edu/ideas/newprofiles/huttel.do>

ENGINEERING 53

Students brought MP3 files from their personal music collections to the lab. iPods were used as signal generators for Computational Engineering. Students analyzed waveforms and altered frequencies, compression, sample rate, and other parameters of their favorite songs.

Course profile: <http://cit.duke.edu/ideas/newprofiles/gustafson.do>

ENGLISH 26S

Students downloaded music, radio plays, and other sounds from early 20th century Europe to analyze how the rise of technology in the era affected literature and communication.

ENVIRONMENT 181

Students recorded audio field notes of environmental observations and interviews with local residents to study how American communities address water problems.

GERMAN 115S

Groups of students recorded interviews with Americans to discover how seminal events in Berlin's history—the World Wars, the Cold War, the fall of the Berlin Wall—are perceived in the United States.

INFO SCIENCE/INFO STUDIES 100 & 140

Students were provided with instructor-made recordings of lectures. In addition, recordings of guest speakers and discussions were posted for review by students.

Course profile: <http://cit.duke.edu/ideas/newprofiles/lucic.do>

INFO SCIENCE/INFO STUDIES 270

Students recorded interviews conducted with biomedical technology experts.

MUSIC 65

Students used iTunes to acquire recordings of selected Bach chorales.

Course profile: <http://cit.duke.edu/ideas/newprofiles/kelley.do>

MUSIC 70

Students recorded samples of sounds in various environments and composed thematic "sonic essays" from their recordings.

MUSIC 128S

Students explored the iTunes Music Store to discover and download relevant examples of Latin American music to augment existing course materials.

MUSIC 137/CULTURAL ANTH 145

Students conducted ethnographic field research using the iPod and other devices to capture interviews and other audio to explore the relationship between music and other social practices.

PUBLIC POLICY 120

Students recorded and reviewed interviews for weekly newspaper-style articles.

Course profile: <http://cit.duke.edu/ideas/newprofiles/rogerson.do>

RELIGION 20S

Students peer-reviewed each other's papers in group evaluation sessions and workshops without needing to take written notes.

SPANISH 1 & 2, 14

Students recorded their own spoken Spanish throughout the semester, submitting audio files for assignments. Student responses during verbal quizzes were also recorded using the iPod. Students listened to examples of authentic Spanish speech to augment reading & writing exercises. The instructor recorded weekly vocabulary words and translations for students. Students also recorded "audio diary" entries in Spanish.

Course profile: <http://cit.duke.edu/ideas/newprofiles/merschel.do>

THEATER STUDIES 129S

Students studied recordings of radio shows such as "The War of the Worlds," "The Shadow," "Amos 'n' Andy" and "The Jack Benny Program." Students also created and analyzed their own show performances.

Course profile: <http://cit.duke.edu/ideas/newprofiles/foster.do>

TURKISH 70

Students used the iPod to listen and become accustomed to a wide range of authentic Turkish language materials such as songs, news broadcasts, and poems.

UNIVERSITY WRITING PROGRAM; WRITING 20

The University Writing Program equipped faculty observers and ten Mellon fellows with an iPod to record class discussions led by the instructors. Instructors then used the recordings in discussions with mentor faculty to critique their effectiveness in leading discussions. Each instructor kept a transcription of an exemplary session in his or her teaching portfolio. Project objectives included clarifying classroom goals, building students' "workshopping" skills, and guiding students to discover potential improvements in their writing on their own rather than relying on faculty guidance.

Project summary report: http://cit.duke.edu/pdf/uwp_ipod_0405.pdf

WRITING 20/24

Students recorded interviews with several individuals to report on patterns in the personal recollections of memorable historical events, such as the Challenger space shuttle explosion.

Course profile: <http://cit.duke.edu/ideas/newprofiles/strano.do>