End of Year Report on the 2005-06 Duke Digital Initiative:
Executive Overview

This report describes key activities in the Duke Digital Initiative (DDI) in 2005-06, summarizes faculty and student feedback on the DDI course activities and the DDI program overall, and describes key projects for the next academic year which have grown out of this year's program.

The Duke Digital Initiative for 2005-06 has been a successful follow-on to the *iPod First-Year Experience* in 2004-05. Many of last year's innovative practices in technology-enhanced learning have been sustained or enhanced. A growing number of faculty from a variety of departments, programs and schools have explored new technology-enhanced approaches to instruction. Faculty and students continue to report that the use of portable, personal multimedia technologies and digital course materials contributes to the course experience and to students' learning. Duke's experiments with new technologies continue to attract public interest and to lead to new opportunities for collaboration with universities, businesses and other organizations.

The goals for this year's Duke Digital Initiative were to promote innovative and effective teaching, to use technology in support of curriculum enhancement, to develop our technology infrastructure, and to share knowledge about effective instructional technology strategies.

Key activities in this year's Duke Digital Initiative included:
- continued experimentation with iPods for audio capture and playback of digital audio
- utilization of new iPod functionalities through course activities involving portable playback of digital images and video, and development of learning materials that incorporate multimedia
- exploration of tablet PCs to increase student engagement in class
- use of hand-held computers for data capture as part of student research assignments
- development of support models for the creation of original video for student and faculty course projects
- pilot of the Lectopia component of the DukeCapture classroom recording service
- hiring a scholarly communications expert to help in navigating issues of intellectual property, copyright and fair use

Major successes this year included:
- use of technology to support key curricular areas such as foreign language learning, writing, service learning and student research as faculty found success using specific tools and strategies across a department or program
- growing number of courses involving multimedia production activities, with faculty and students reporting that this increases student engagement and student learning
- development of collaborative staffing models and more robust technical environment for support of instructional IT projects

- active collaborations with businesses, universities and other organizations which allowed Duke faculty and students to shape development of new technologies; examples include partnerships with the University of Western Australia (Lectopia), Apple (iTunes U), Public Radio International (digital audio content)
- multiple opportunities for Duke faculty and staff to discuss their ideas with a national and international set of colleagues through participation in conferences and professional groups
- use of faculty and student experiences with and feedback on educational technology to plan new facilities in the Library and other parts of campus

Innovative use of technology brings with it a set of challenges. Some key issues this year included:
- difficulty obtaining multimedia content for courses in a timely and cost-effective way
- rapid and unpredictable evolution of consumer technologies which created ongoing challenges for planning, training, and support
- demand for video capture of classroom presentations exceeds classroom capabilities
- continuing need to transition instructional practices into the multimedia environment

Given the interest in technology innovation expressed by students and faculty and the now-established uses of portable, personal digital media devices in courses, the University will continue the Duke Digital Initiative in the 2006-07 academic year. The coming year will focus on further development of infrastructure and support services for those technologies and teaching strategies deemed successful by students and faculty plus new explorations of technology in learning and instruction.

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The Duke Digital Initiative is a joint project of the Office of the Provost, Office of the Executive Vice President, Office of Information Technology, Division of Student Affairs, Center for Instructional Technology, and Duke University Libraries.

End of Year Report on the 2005-06 Duke Digital Initiative

Background: The Duke Digital Initiative

Building on the success and lessons learned through the Duke iPod First Year Experience in 2004-05, Duke University demonstrated its commitment to continued innovation by establishing the Duke Digital Initiative (DDI) for the 2005-06 academic year. This year, Duke went beyond exploration of a single technology (the iPod) and established a framework for exploring educational applications of academic and consumer market technologies.

The four goals for this year's Duke Digital Initiative were to promote innovative and effective teaching, to use technology in support of curriculum enhancement, to develop our technology infrastructure, and to share knowledge about effective instructional technology strategies. Through the Duke Digital Initiative, Duke has provided support for the continued integration of iPod devices into academic courses, and created new opportunities for exploring digital images, digital video, and collaboration technologies and the use of tablet PCs and handheld devices.

As part of the DDI, we have implemented a three-phase model for technology experimentation, development and implementation. Goals for specific technologies and projects vary depending on the phase of the initiative. In Phase 1, we emphasize open-ended experimentation to allow faculty and students to find out what is most useful and what is not. Based on evaluation at the end of Phase 1, we identify those educational technology models which seem most promising for further exploration. During Phase 2, we increase the number of courses and instructors utilizing those models and try to further develop the infrastructure we need to sustain them. During Phase 3, we move the most effective of those technology-enhanced practices into a more fully supported environment

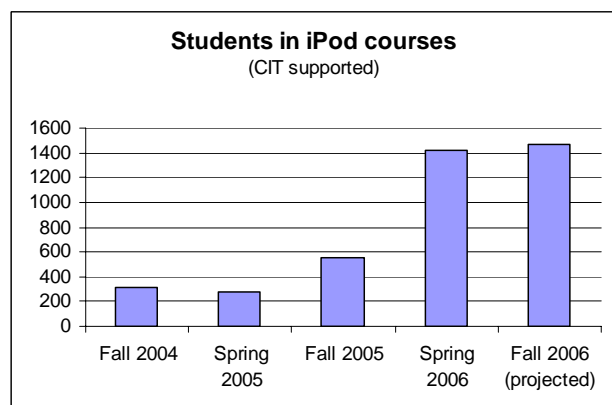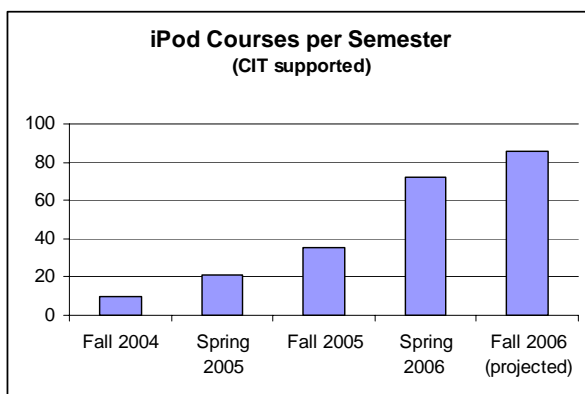| *Experimentation Phase 1*	*Extension and Transition Phase 2*	*Standard Support and Integration Phase 3*
Pilot projects and introduction of new technology-enhanced practices	Development of infrastructure and technology support models for effective practices	Wider support of service/technology for effective practices

Phase 1 (experimentation) projects this year included experiments with faculty and student production of multimedia materials, such as the production of multimedia reference materials. For example, instructor Mark Williams developed a multimedia glossary to help neurobiology students learn over 500 terms critical to their understanding of the functional anatomy of the human brain. For each term, a student could access a description of the term, information on brain structure location and function, audio pronunciation, links to related terms and high quality brain images optimized for the iPod photo display. In a course studying the Watergate hearings, students used their iPods to refer to scanned photos and explanatory text about key individuals involved in those events.
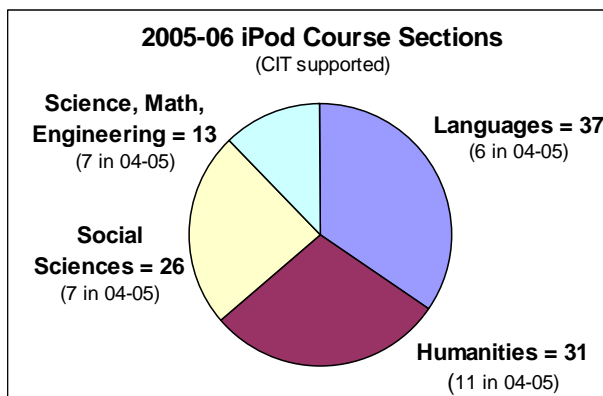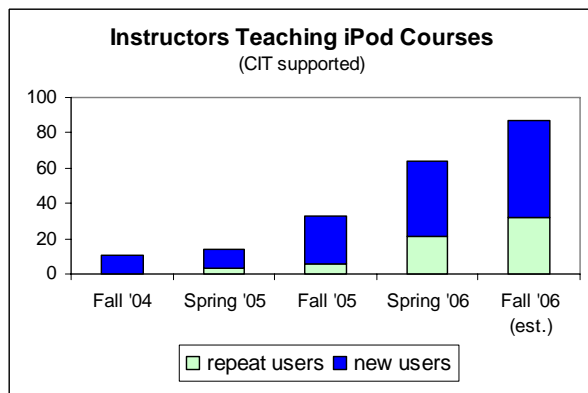
This year's DDI phase 1 projects also included multiple pilot projects in capturing lectures and other course events for class review, pre-class assignments or re-use in other ways. In some cases faculty used University-provided experimental tools such as the Lectopia (a component of DukeCapture), while in other cases faculty recorded lectures on their own computers or used tools such as Captivate to develop tutorials and demonstrations.

Growing interest in sharing materials beyond the classroom led to experiments in podcasting and other ways of disseminating materials. For example, the Fuqua School of Business launched Fuqua on iTunes U as a mobile content portal to Fuqua faculty research highlights, video of recent conferences and speakers, as well as multimedia content about Fuqua people and global events. Faculty in other schools experimented with DukeCast, a Duke-developed podcasting tool, or tried commercial products on their own.

Also new this year were experiments with tablet PCs in Engineering and Computer Science and student use of hand-held devices for data collection as part of their research in Psychology and Biological Anthropology and Anatomy. Two collaboration tools were added to Blackboard, our learning management system, in the Spring 2006 semester. One was a journal or blog-like tool, and the other was a wiki-like tool for collaborative team-based website editing. Both tools are well suited for group projects and are integrated with Blackboard's grade book. The journal tool was used in approximately 20 Blackboard course web sites, and the teams tool was used in about 12 course web sites in the Spring 2006 semester.

Phase 2 (extension/transition) projects this year included continued use of iPods. Course sections using iPods in 2005-06 tripled over 2004-05, with growth in the number of faculty and students and use in a wider range of departments and programs. More courses focused on students producing digital materials in course assignments. For example, students in professor David Schaad's course "Rebuilding from Ruins" created audio journals during a service trip to the Gulf coast after Hurricane Katrina and gave oral presentations when they returned, using excerpts from interviews collected during the trip. In another course, a student edited a radio program file so that he "became" the interviewee and thus demonstrated his understanding and interpretation of the issues in the program.

iPod Courses per Semester
(CIT supported)

Students in iPod courses
(CIT supported)

Instructors Teaching iPod Courses
(CIT supported)

2005-06 iPod Course Sections
(CIT supported)

Science, Math, Engineering = 13 (7 in 04-05)

Languages = 37 (6 in 04-05)

Social Sciences = 26 (7 in 04-05)

Humanities = 31 (11 in 04-05)

Staff in the Center for Instructional Technology (CIT), the Office of Information Technology (OIT) and school IT departments developed new processes for supporting iPod users and for integrating iPod use with other key tools such as our learning management system. Expanding use of iPods and multimedia materials also shaped planning for how to provide broad support for playback of digital audio, images and video in classrooms and influenced planning for new spaces and services in Perkins and Bostock Libraries. For example, the Perkins Library is planning new spaces where student groups can produce, rehearse and distribute multimedia presentations.

In response to growing faculty interest in the use of digital images in teaching, a planning team comprised of representatives from Arts & Sciences Information Science and Technology (A&SIST), Duke's Office of Information Technology, the Center for Instructional Technology and Perkins Library initiated the Image Tool Planning Project in summer 2005. This project clarified faculty needs with respect to the use of images in teaching and learning, reviewed technologies and recommended tools for faculty exploration during the 2006-07 academic year. The full report is available at: http://www.duke.edu/ddi/ImageToolReport_20060407.pdf.

Successes and Progress toward DDI Goals in 2005-2006

Conclusions in this section are based on analysis of faculty requests over the course of the year; student and faculty feedback from active projects during the Fall 2005 semester and Spring 2006 semester; conversations with faculty and staff on the Information Technology Advisory Committee, the Center for Instructional Technology Advisory Board, and the Instructional Technology Strategic Planning Committee; and a series of specially convened faculty discussion groups designed to provide insights and feedback on the Duke Digital Initiative.

The Center for Instructional Technology (CIT) and Office of Information Technology (OIT) staff held four group meetings with faculty in February 2006 to get their feedback about current DDI activities and their suggestions for the future. These group meetings included 32 faculty, some currently involved in DDI projects and some not.

CIT sent Web-based surveys to all faculty whose courses were designated as iPod courses in the Fall 2005 and Spring 2006 semesters. In the fall semester, all 34 instructors completed the survey as requested (100%); in the spring term, 62 of 66 instructors (94%) completed the survey.

CIT also sent Web-based surveys to students in all iPod courses for both terms. For the Fall 2005 semester, 272 of 550 students completed the survey (49.5%); for the Spring 2006 semester, 667 of 1424 students (47%) completed the survey.

Staff involved in the Duke Digital Initiative also contributed information based on their ongoing work with faculty and students involved in DDI projects.

As stated above, DDI activities in 2005-2006 supported four goals: Innovative and Effective Teaching; Curriculum Enhancement; Infrastructure Development, and Knowledge Sharing. Accomplishments toward each goal are described below.

Goal 1: Innovative and Effective Teaching

During 2005-2006, faculty and students continued to increase their course use of digital audio content from a variety of sources including externally produced podcasts, the DukeCapture classroom recording system (Lectopia), Public Radio International, and original student and instructor recordings. For example, sixteen courses reported assigning students to subscribe to externally produced podcasts. Faculty continued to use iPods to support their teaching, most commonly by listening to student recordings; recording student consultations or oral exams; preparing original recordings for student use; recording lectures or course discussions; and in-class display and playback of audio, image and video materials.

> *"The iPod has been invaluable for me as a teaching tool. I have music available at my fingertips and can play examples at any moment. I plan the lectures and align the recordings I make available with the reading so my listening lists complement the text... when students ask questions due deeper explanation, I have all of my other recordings at my disposal without needing to wait until the next class... to bring in another recording. With the iPod, I have them right there."* (Music 74 instructor)

Courses using DukeCapture's Lectopia recording system produced hundreds of hours of recorded lectures which appear to be well used by students. The School of Medicine recorded over 700 lectures. Recorded lectures were accessed 14,606 times for the School of Medicine's single largest course, and 10,248 times for the School of Medicine's second largest course during the Spring 2006 semester. Each of the 28 lectures recorded for a course in the Pratt School of Engineering were accessed an average of 102 times. Listening to class materials outside of class time (both lectures that faculty recorded and those students recorded themselves on their iPods) continues to be one of the top uses for iPods. Students stated in surveys that they found recorded lectures useful for clarifying information and for studying.

> *"[The most useful thing about using the iPod was] being able to review lecture with the PowerPoint slides in hand and make notes that I missed originally."* (Medical Physics student)
>
> *"[The most useful thing about using the iPod was] being able to hear the various speakers' lectures and presentations outside of class, especially when I was working on papers and assignments."* (Environmental Studies student)

In the iPod program, the potential to make digital video and enhanced audio files accessible to students in downloadable format has allowed faculty to increase dramatically the multimedia materials that are integral to the program of study in a number of different disciplines, including Languages, Theater Studies, Film and Video, Documentary Studies, and Public Policy. Students continued to laud the benefits of portable audio recording technology in their course experiences and are very interested in exploring more in-depth the potential uses of image display and video playback in portable formats. The expansion of the iPod program for instructional purposes engaged the largest number of faculty and students, with faculty-driven course use of iPods increasing 40-50% each semester to a level of 1,424 students enrolled in 72 distinct iPod courses taught by 64 instructors from 18 different Duke departments and programs in the Spring 2006 semester.

Some faculty have reported transformative changes in their courses by providing students with the opportunity to become content authors and publishers. Across disciplines, they report that the quality of student work and level of student engagement increases when students are supported in publishing their work beyond the classroom boundaries. Professor Daniel Foster's Theater Studies students produced and podcast eight radio theater programs which were downloaded 10,000 times in the first nine months. In the Writing 20 course *Rewriting the Past, Inventing the Present*, students researched recent historical events, such as the Apollo moon landings or crash of TWA Flight 800, comparing news coverage of the events with recorded interviews of individuals in the Duke and Durham communities about memories and impressions of these events. For the final project, students assembled the research into self-running PowerPoint presentations that were displayed in Lilly Library. The display was advertised on campus, and individuals could leave comments on the student projects using an iPod that had been set up at the exhibit.

As more faculty incorporated audio editing and recording tasks into their curricula, instructors and students began to focus on the pedagogical applications and benefits of digital audio, moving beyond the predominantly technical, process-based discussions more common in the early experimental phases in 2004-2005. This has led to cross-disciplinary conversations on campus and is facilitating community-based development of best practices and models, drawing on the experiences of

> *"By using the iPods as recording devices, students were able to bring the sounds of local clergy and church services into the classroom. These sounds, along with the digital pictures students took using personal cameras, offered a multi-media introduction to various Christian traditions. I could never achieve the effects of these presentations through lecture or readings. The iPods allowed students to collect and report their findings in a richly evocative way."* (Religion 20S instructor)

instructors in Documentary Studies, Languages, Theater Studies, Cultural Anthropology, Public Policy, Education, and community-based service learning courses, among others.

In French 76, a digital video pilot project to produce short films in the target language was considered technically and logistically challenging but highly successful by the course instructor and students. The implementation of this activity allowed students to synthesize the language

learned across multiple semesters of instruction and motivated them to perfect the written and oral performance work done for this activity with a degree of attention not given to other, individual assignments. On the support side, this project yielded a much clearer picture of the types of training and services needed to sustain video production projects across a larger number of courses in future semesters. This experience is now being used to shape the next iteration of the DDI digital video pilot, which will continue in the Fall 2006 semester.

Early explorations of tablet PCs suggest that this technology has potential in some areas of teaching and is worth further exploration. Faculty report that tablet PCs can help students remain engaged in class activities, that tablets can allow greater connection between lecture and laboratory (data collected on the tablets in lab can be brought to the classroom easily), and that tablets allow flexibility in their classroom presentations. In the coming year, DDI staff will be investigating questions related to the impact of tablet functionality on teaching and learning as well as technical and support questions related to tablets (See "Plans for 2006-2007", page 14).

Goal 2: Curriculum Enhancement

In some cases, efforts at incorporating the use of digital media have extended beyond individual instructors and courses to impact curriculum on a broader scale. The most notable efforts have occurred in language departments and programs, the first-year writing program, and in furthering university initiatives around service learning and student research.
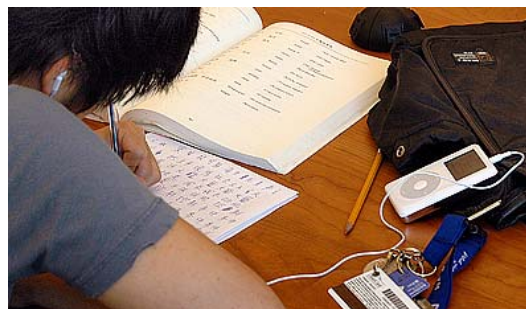
In the language departments, the mobility afforded by use of iPods has allowed instructors to implement speaking and research assignments that allow students to explore the local community and engage with native speakers in real-life settings outside of a computer lab. It has also facilitated the enhancement of existing oral homework in ways that were not possible with the computer-based recording methods previously in use, making it much more practical for students to carry out the targeted review and practice activities necessary for the

> *"The iPod was useful in improving my listening comprehension for French. It was also a useful tool to learn more about French culture through music and video."* (French 76 student)

development of linguistic competence. Finally, the ability to make video materials (a cornerstone of language instruction) directly available to students promises to make it much easier for students to review and study authentic language and culture in context.

In Writing 20, Duke's required writing course for first year students, instructors used iPods for a variety of class activities. Students recorded comments on each other's work and group critique sessions, and faculty

recorded writing discussions, creating more detailed and extensive peer and instructor feedback. Students also used iPods as a means for recording interviews and other materials as they researched papers, which encouraged them to gather more accurate information.

The overall attention to issues surrounding the integration of video in instruction led to the Law School receiving a Group Fellowship from the CIT. In this year-long project, which began in late 2005 and will continue through the end of the 2006, several faculty in the Law School are working together to develop effective ways to use video in teaching clinical courses. The Law School faculty have created a rubric for evaluating student encounters with clients and are exploring the appropriate uses for video recordings of student-client sessions and providing video-based models for use during clinical training.

Goal 3: Infrastructure Development

During this year, Duke's infrastructure became increasingly able to support a more seamless integration of a variety of DDI technologies. For instance, students and instructors were able to create original recordings which they submitted as homework or distributed to others in the class via the Blackboard learning management system, iTunes U or a podcasting tool.

This year's implementation of the Blackboard tools Teams LX and Journal LX , which provide wiki- and blog-like functionality within the learning management system, has enabled students and instructors to collaborate in an environment that has full, enterprise-level technical support. One example of how these tools have been used was reported in INSIDE, the Duke University Medical Center and Health System Employee Newsletter (June 5, 2006, Vol. 15, No. 11). Two instructors in the School of Nursing have used the Journal tool to create connections between participants in their online courses, increasing interaction among students who rarely get to see each other. As the Duke community becomes more familiar with these tools and the best practices for their implementation, we expect their use to increase.

In the DDI support model, our goal was to extend and transition support of established iPod functions such as digital audio capture by developing infrastructure and service models. This effort led us to change our iPod distribution model from one that took place in individual classes to a centralized system utilizing the computing help desk managed by Duke's Office of Information Technology (OIT). We also began to transition our training program from an entirely custom, in-class model to one in which standard training sessions on basic topics were offered to students in the evening, allowing the instructor to preserve class time for curricular activities. Custom training for classes was available upon request, and we continued to offer regular group training sessions on iPod features as well as pedagogical consulting to iPod project faculty upon request. Support for iPod courses was shared among the Center for Instructional Technology, whose staff served as project liaisons and provided training to faculty on technical and pedagogical topics; the Office of Information Technology, whose help desk served as a single point of contact for technical issues and questions; Student Technology Services provided student training and departmental IT staff, who maintained the office computers used by instructors to carry out their work tasks.

Goal 4: Knowledge Sharing

This academic year saw several successes in knowledge sharing and collaboration among universities, businesses and other organizations. The Duke Podcasting Symposium and the partnership with Apple in developing iTunes U are two notable examples.

General interest in podcasting grew this year as this method of syndicating digital content captured the public imagination and garnered extensive attention in the popular press. Duke hosted the first-ever academic Podcasting Symposium in September 2005, which piqued faculty interest and started numerous conversations about possible applications in the instructional arena (http://www.isis.duke.edu/events/podcasting/).

iTunes U resulted from the continuation of a partnership begun with Apple Computer in Fall 2004 to pilot a new, iTunes-based content distribution tool for educational institutions. Duke was one of two original pilot institutions and played a key role in guiding the development of the tool's features and underlying support structure. During the Fall 2005 semester, one course in Information Science + Information Studies (ISIS) participated in an early implementation of the tool for academic use; this pilot was expanded in the Spring 2006 semester to 6 courses with 14 instructors and 215 students overall. In June 2006, Duke's Fuqua School of Business launched "Fuqua on iTunes U" to serve as a Mobile Content Portal providing access to faculty research highlights, video of recent conferences and speakers, and multimedia content about the school's people and global events. (http://www.fuqua.duke.edu/itunes/)

More information: http://www.fuqua.duke.edu/itunes/

Participants in the Duke Digital Initiative shared their knowledge about evolving models for uses of digital media in teaching in on-campus and off-campus settings. Several faculty gave presentations about their projects at the Duke Instructional Technology Showcase (http://cit.duke.edu/showcase/2006/presentations.html) in April 2006. Professors Richard Lucic

(ISIS) and Daniel Foster (Theater Studies) gave presentations at national and international conferences on their uses of iPods and podcasting, while Professor Vicki Russell and several of her students gave a conference presentation on uses of the iPod in improving writing. OIT and CIT staff members gave presentations at the EDUCAUSE national conference, the American Library Association national conference, national conferences in specific disciplines such as languages, and a variety of regional conferences.

During the 2005-06 DDI, two additional significant collaborative efforts took place. Duke continued working with the University of Western Australia regarding the classroom capture tool Lectopia (formerly called iLecture). Duke faculty utilized new functionality added to Lectopia this year, while OIT began incorporating this tool into the evolving, comprehensive DukeCapture service. Another key collaboration was Duke's work with Public Radio International (PRI). In this partnership, PRI made several of its radio programs available as digital audio files for course use. In return, librarians are advising PRI on strategies for searching for audio materials as well as business and support models. (http://www.dukenews.duke.edu/2005/08/pri_partnership.html)

http://www.dukenews.duke.edu/2005/08/pri_partnership.html

Collaborative cross-unit relationships and partnerships that were strengthened last year through the mutual support of the First Year iPod Experience have continued in 2005-2006. Those partnerships have been invaluable in planning for and developing the instructional technology environment necessary to sustain the advances made through this year's DDI and to allow even more faculty to benefit from the new tools and techniques that have proved valuable. The major stakeholders across university and school IT services and units have worked tirelessly to develop support models that can provide timely, appropriate and excellent service for the range of technologies under exploration.

Challenges in 2005-2006

Although faculty and students participating in this year's DDI programs were largely positive about the opportunities the program afforded to them, consultations with faculty and student focus groups and a review of this year's evaluation surveys raised several issues that need to be addressed to ensure the long-term benefit of DDI technologies in the classroom:

- ***Difficulty obtaining course multimedia content in a timely and cost-effective way***
  We have explored several different models for providing content for course use but have found challenges with all of them.

  Although CIT offers a mini-grant program to assist faculty in creating digital course materials, this program is limited in scope and designed for one-time, proof-of-concept projects. There is no general materials production service; faculty must digitize the materials themselves or pay a fee to have it done. In the coming year, we will explore what resources are needed to provide more extensive help with digital materials production.

  The tools for searching digital audio, images and video are still evolving, and those that exist do not make it easy for faculty and students to find specific items or segments of materials.

  > *"Digital audio from PRI was available, but it's cumbersome to browse the programs."* (GS 321 instructor)
  >
  > *"Converting music and oral history interviews to MP3 format was much more time consuming than I expected."* (Public Policy/History 166 instructor)

  We planned a pilot program to explore purchasing content in volume from the iTunes Music Store and agreed to support several large courses whose activities centered around listening to these materials. The process proved difficult to implement, and courses did not obtain the materials in the time frame they expected. This may explain why the percentage of students stating that they used their iPods to listen to commercial or professionally recorded content (other than textbook content) dropped from 35% to 19% between Fall 2005 and Spring 2006 [see Appendix A].

  In another area of challenge, some textbook publishers are reluctant to support distribution models that provide unrestricted access to digital copies of their content. We will be watching the development of digital rights management tools that may allow users to exercise fair use rights to provide materials for relevant academic use while restricting unauthorized access. Our Scholarly Communication Officer, who joined Duke last month, will be a resource to help with this in the coming year.

- ***Rapid and unpredictable evolution of consumer technologies which created ongoing challenges for planning, training, and support***

  The iPod model available for purchase on the retail market changed in the middle of the Fall 2005 semester. While this new "5th generation" model incorporated the ability to view video, a feature that is very much in demand by faculty and students, almost all Duke iPod courses had already come to depend on the portable, easy-to-use recording feature of earlier iPod models. Without a microphone for the 5th generation iPod device, it was difficult for faculty whose courses received this model to implement substantial portions of their course plans for that semester. Consultants suggested alternate arrangements using desktop computer recording options, but instructors were not able to replicate the portable recording activities that would have been key components of their courses. In many classes, recording was intertwined with other uses of iPods, such as developing class presentations with audio or producing multimedia projects. The lack of a microphone for 5th generation iPods in the

spring semester combined with difficulties obtaining the commercial recordings some classes were counting on may explain the overall drop in percentage of students using their iPods for many activities in Spring 2006 versus Fall 2005 (See Appendix A). Microphones are no longer available for 4th generation iPods, and this may have an impact as we move into the third year of using equipment distributed during the original iPod program.

Over 20% of faculty and over 27% of students stated they had technical problems with hardware or software. The

> *Microphones to go with the 5th generation iPods turned out not to be available during the semester. Therefore three course projects integral to the curriculum had to be shelved (recording of diaspora Hindi in the Triangle area; recording of weekly compositions for classroom playback, and preparation of short audio plays for the annual Hindi festival).* (HINDI 126 instructor)
>
> *My hope was to take advantage of the improved sampling rate of the new video iPods. Students would have used remote recordings in their compositions. Unfortunately the third party hardware was not available in time. This limited the use of iPods to listening repertory and file transfer.* (MUSIC 154S instructor)

comments ranged from reports of broken iPods or microphones, to difficulty understanding how to use the hardware and software, to long delays in getting iPods returned when they were sent for repair. We do not have reliable data about the number of broken iPods or microphones, or whether those that were broken were dropped, misused or simply failed. Although faculty and students were urged to purchase extended warranties, very few did so, leaving many individuals this second year with out-of-warranty equipment. In the coming year, we will be providing more training for faculty and students, more in-person assistance at the Help Desk and more training for departmental IT staff to help individuals distinguish between not understanding how to use equipment correctly versus knowing when equipment is malfunctioning. We will continue to urge individuals to purchase extended warranties for iPod devices.

Instructors and students noted that while there was sufficient information available about the basic recording functionality and potential course uses for the audio recording feature of the iPod, there was much less training available for other, newer features, such as the ability to display and playback images and video. While some faculty and students felt current training offerings were too basic, others continued to struggle with synchronizing audio and image files, utilizing iTunes or using other features of the iPods. Future training plans need to provide a more holistic view of the device's capabilities. Such training could enhance the perceived value and usefulness of the device for both instructors and students in their academic work. Plans for 2006-07 include a wider variety of training options, including multimedia training materials for playback on the iPod.

- *Demand for video capture of classroom presentations exceeds current classroom capabilities*
  While the Lectopia component of the DukeCapture service has proved very useful for the classrooms in which it is installed, most classrooms do not yet have lecture-capture capability. Additionally, a growing number of faculty wish to have student presentations, including group presentations, recorded and made available for later review. We do not yet have an easy, established process for responding to this demand, nor do we have an adequate method for matching courses to the classroom spaces that have the technology infrastructure needed to support planned classroom activities. The growing use of classroom recording also

raises questions about intellectual property and student privacy that will need to be addressed in the coming year.

- ***Transitioning teaching and learning practices into the multimedia environment***
  Although a number of instructional uses of digital media and portable media players have been clearly demonstrated to be beneficial, some of our instructors and students feel they need to learn more to be able to use digital media most effectively. In other instances, some students were reluctant to abandon "tried and true" ways of doing homework assignments in favor of technology-assisted methods, such as audio peer review or video viewing in the relatively small iPod format. As with other technologies Duke has introduced in previous years, students reported a desire for faculty to make greater use of the technology tools the University provides and to integrate those tools fully into course activities. In several classes, students reported that instructors did not use the full capabilities of the technology and were disappointed that instructors did not do so.

> *"I don't feel I adequately made use of the technology... But having the iPod option for a semester has broadened my thinking about how best to facilitate students' learning and has opened my eyes to other digital technologies that might enhance other courses I teach."* (Public Policy instructor)
>
> *"The capabilities are substantial, but an unmotivated or untrained teacher can really drop the ball".* (Writing 20 student)
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> *"I don't think they [iPods] serve very well for educational purposes unless teachers make their classes more hands on and exploratory." (English 117 student)*

Plans for 2006-2007
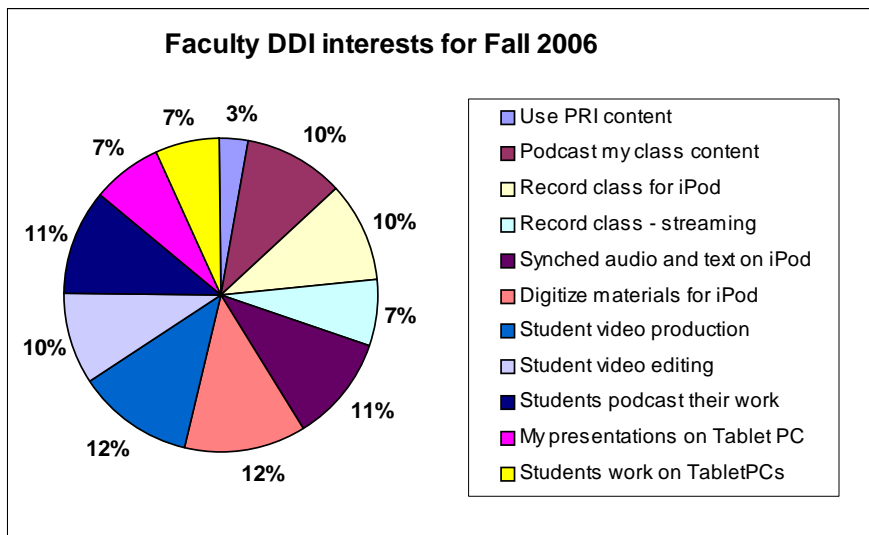
The Duke Digital Initiative in 2006-07 will provide for both deeper and broader uses of technology for innovation in teaching and learning, expanded technology infrastructure development and continued collaboration with educational and business partners. As the chart of faculty interests shows (see below, page 15), faculty have expressed interest in a range of activities growing out of this year's DDI experimentation.

This year's Duke Digital Initiative made a number of new technologies available for faculty exploration. Still, faculty interests exceed our current support abilities. For example, instructors have requested web-based collaboration tools such as blogs and wikis for course use outside our learning management system; other would like to use these collaboration tools for educational uses that do not fit the traditional course structure. Others have expressed interest in making greater use of video conferencing, simulations and games in teaching. Faculty and students would like better tools for searching and annotating digital video and audio, want access to larger collections of digital audio, images and video and would like assistance in creating multimedia materials for teaching. In the coming year, we will explore ways of supporting these interests.

Faculty and students have established multiple uses for iPods in their academic work. Thus, we will continue to support academic use of iPods, but will position the iPod as a course supply, much like a textbook. Rather than giving "free" iPods to students, Duke will offer students in iPod courses the opportunity to purchase a package consisting of an iPod and microphone at a discounted (subsidized) price of $99. As in previous years, instructors teaching a supported course involving iPods will receive an iPod for their own use at no cost. As of June 16, 2006, 53 instructors have submitted proposals for using iPods in 86 courses in the Fall 2006 semester.

Faculty DDI interests for Fall 2006

Legend:
- Use PRI content
- Podcast my class content
- Record class for iPod
- Record class - streaming
- Synched audio and text on iPod
- Digitize materials for iPod
- Student video production
- Student video editing
- Students podcast their work
- My presentations on Tablet PC
- Students work on TabletPCs

We will capitalize on the growing faculty and student interest in uses of digital video by supporting several pilot projects involving digital video production. Duke will loan cameras and editing equipment to students or faculty for course projects involving digital video production, and will offer consulting and training in support of course activities. We will also utilize the iPod's expanded functionality for video.

Instructors from Chemistry, Computer Science, Sociology and the School of Engineering have expressed interest in exploring ways tablet PCs can increase class interaction, provide better linkage between lecture and lab activities, and more effectively accomplish course goals. For the 2006-07 year, the DDI will provide a pool of tablet PCs for use in courses and by professors and will work with instructors on evaluation of the tablet PC's effectiveness. In addition to 14 tablets available for distribution to students in a course(s), a group of 4 loaner tablets will be available for faculty to use, either for the full semester as a presentation tool, or for up to 4 weeks for exploratory purposes.

Our infrastructure development projects for the 2006-07 academic year are designed to respond to the growing interest in creating and distributing multimedia materials. Duke's partnership with Apple Computer, Inc. will continue with the ongoing pilot of iTunes U in officially designated iPod courses. Duke's Office of Instructional Technology will further develop and conduct pilot projects for the capture and distribution of digital materials with the DukeCapture and DukeCast offerings. The automatic recording of a lecture's audio and video components and ability to distribute that content as digital files for download or streaming will be a key component of those services. Duke will continue to work with the University of Western Australia to enhance the Lectopia component of DukeCapture's usefulness for course activities. Faculty will continue to have access to digital content from Public Radio International as the Duke Library continues working with PRI on new ways of searching for and using digital content. More information about these and other projects will be posted on the Duke Digital Initiative website.

The past two years have provided faculty and students with a chance for open-ended exploration of new technologies. Our formative evaluation of course projects and systematic collection of qualitative data has provided useful information for instructional technology planning and for infrastructure development. In the coming year, CIT hopes to recruit faculty in one or more program areas for a quantitative study of the impact of these new technologies on student attitudes and student learning.

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End of year Report prepared by:
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Charts and data summaries by Patricia Pawlak, Center for Instructional Technology

Photographs by Mark Zupan, Perkins Library

The Duke Digital Initiative is a joint project of the Office of the Provost, Office of the Executive Vice President, Office of Information Technology, Division of Student Affairs, Center for Instructional Technology, and the Duke University Libraries.

Related Web Sites

Duke University Libraries: http://library.duke.edu/
Duke Digital Initiative: http://www.duke.edu/ddi/
Webcast on 2005-06 Duke Digital Initiative: send email to ddi@duke.edu
Office of Information Technology: http://www.oit.duke.edu/
Center for Instructional Technology: http://cit.duke.edu/home.do
Profiles of courses using iPods:http://cit.duke.edu/ideas/newprofiles/ipod_faculty_articles.do
List of courses using digital technologies, by semesters
    Fall 2004: http://cit.duke.edu/about/ipod_faculty_projects.do
    Spring 2005: http://cit.duke.edu/about/ipod_faculty_projects_spring05.do
    Fall 2005: http://cit.duke.edu/about/ipod_faculty_projects_fall05.do
    Spring 2006: http://cit.duke.edu/about/ipod_faculty_projects_spring06.do
Lectopia, Podcasting and OIT support for digital media tools:http://www.oit.duke.edu/dms/
Evaluation of first year iPod project: http://cit.duke.edu/pdf/ipod_initiative_04_05.pdf

Appendix A – Excerpts from Student and Faculty Surveys

Students responses: "How have you used your iPod for your coursework this semester?"

Use	Fall 2005		Spring 2006	
	Rank	% who did:	Rank	% who did:
Recording outside of class	1	79	1	26
Listening to commercial or professionally recorded content besides textbook audio	6	35	2	19
Storage or transfer of files from one computer to another	2	45	3	18
Listening to original Duke content (recorded by the instructor or another student)	4	42	4	18
Listening to recorded lectures or class discussions outside of class time	5	35	5	15
Listening to course-related digital audio during class	7	29	6	14
Recording during class	3	43	7	14
Listening to audio that accompanies the textbook for the course	8	19	8	8
Other	9	15	9	9
Studying with flash cards	10	4	10	1

Faculty responses: "How did students use iPods in your course?"

Use	Fall 2005		Spring 2006	
	Rank	% who did:	Rank	% who did:
Recording outside of class	1	76	1	65
Listening to commercial or professionally recorded content besides textbook audio	3	44	2	53
Storage or transfer of files from one computer to another	4*	38	5	33
Listening to original Duke content (recorded by the instructor or another student)	2	62	3	47
Listening to recorded lectures or class discussions outside of class time	7	26	7	20
Listening to course-related digital audio during class	5	32	6	27
Recording during class	4*	38	4	37
Listening to audio that accompanies the textbook for the course	8	24	8	15
Other	6	35	5	33
Studying with flash cards	9	3	9	3