Scholarship of Teaching and Learning Leadership Award Proposal

Title: What are the effects of podcasting on teaching, learning and technical support in a hands-on technical computer literacy course?

Co-PIs: Dr. Howard Rosenbaum and Mark Napier (Director of Technology)
Associated participants: Dr. Debora Shaw, Cameron Tuai, Mohammad Chuttur (doctoral students) and Dale Wray (Web Coordinator, SLIS Technical staff)
School of Library and Information Science

The School of Library and Information Science has a basic computer literacy course, S401 “Computer-Based Information Tools” that is required for all Masters of Library Science students and recommended for Masters of Information Science students who have deficiencies in their digital competencies (it also open to upper-level undergraduates). Its purpose is to provide students with a baseline set of technology and information literacy skills that prepare them to meet the challenges of their programs. It is taught three times each year, during the fall, spring and summer semesters to a total of approximately 150 students. Because of the rate at which technology changes, the course is frequently updated and modified. In the most current version, there is a new module focusing on social computing and Web 2.0 technologies. In this research proposal, we describe a project intended to investigate the effects of one such technology, podcasting, on student learning, instructor pedagogy and the workflow involved in teaching and supporting this technology.

We interested in studying the use of audio/video podcasting as a tool for learning and instruction to see how this investment, encouraged by the University in the recent UITS Faculty Podcasting Initiative, may pay off. In particular, we would like to evaluate student learning outcomes and satisfaction with a hands-on technical course comparing a version where students one section of an in-person lecture/lab class have access to an audio/visual database designed to help with their assignments with a version where students do not. We also want to understand the workflow involved for faculty and support staff as the technical infrastructure is maintained over time. We believe that the results of this project can have a sustained impact upon instructional development on campus and can serve as a model for other Schools and departments interested in using podcasting and other similar multimedia technologies.

This is timely topic because, as Nelson Laird and Kuh (2005:18) point out:

Many campuses have invested substantial amounts of resources to make various forms of information technology accessible to students. The relatively high frequency with which students are using information technology for educational purposes and the positive relationships between students’ academic uses of information technology and multiple aspects of student engagement suggest that those investments are paying off.

In addition, the research addresses one of the key General Education requirements, “information fluency;” which (Bloomington Faculty Council, 2006)

…Includes, but goes beyond, information technology skills, to introduce students to critical information resources that underlie the major field of study and introduce students to skills in utilizing information resources within that field. Students should be able to determine the extent of information needed, access the needed information effectively and efficiently, evaluate information and its sources critically, incorporate selected information into one’s knowledge base, use information effectively to accomplish a specific purpose, and understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.”

We plan to add to the podcast knowledge base each semester the course is taught and after the field study is completed, to open the knowledge base and offer it as a publicly accessible resource. Because the topics of the podcasts will directly address the criteria described in the definition of information fluency, we believe that the podcast knowledge base may become a useful resource and may illustrate a direction for the next generation of digital knowledge bases.
We are well qualified to conduct this research because of Rosenbaum’s expertise in social informatics, a useful approach for investigating the complex relationships among people, technology, and the contexts in which the technologies are designed, used and maintained, and Napier’s technical expertise, which will allow him to manage the development, implementation and maintenance of the infrastructure required to support the creation, production, storage and dissemination of the podcast knowledge base. The faculty member overseeing the course, Dr. Debora Shaw, and the two doctoral students who will be teaching the course, Cameron Tuai and Mohammad Chuttur, have all agreed to participate in the project.

**The study**

We will use S401, Computer Based Information Tools, as the site for the project. Leveraging a UITS Faculty Podcasting Initiative grant that we received to develop a student-generated podcast knowledge base for information literacy in the fall S401 class, we want to assess empirically the impact of this resource in the fall 2009 version of S401; typically enrollments are much larger in the fall (averaging ~100 students) than in the spring (~20-25 students) and summer (~20 students). This will allow two semesters and the summer for students to generate the podcast knowledge base and in fall ’09 we will use one section as a control and the other as an experimental group, exposing the latter to the podcast knowledge base (see the timeline below). Although this project does require the development of a technical system to support the podcasting activities (see budget narrative below), what is of key importance is the research problem – in what ways does the introduction of this technology change teaching, learning and the work of those supporting the system? The syllabus for the spring 2008 semester can be found here:


This is an apposite choice because the course is divided into modules, each of which has a set of objective measures used to evaluate the work done in that module. We plan to do the production work and development of the podcasting module in the summer and work with students to develop the knowledge base in the fall, spring, and summer versions of the class. This should yield close to 50 podcasts to initially populate the knowledge base. We will then run a comparative field study in the fall 2009 version of the course.

Some of the questions we plan to ask include:

- What are the differences in learning outcomes and quality of experience for those who had access to the podcast knowledge base compared to those who did not?

- For students in the control group: how many hours did they spend working on class assignments? In class? Offline? What resources did they use? How useful were the assignments? We may also ask if they have seen the podcasts because despite the fact that the knowledge base will be restricted to students in the experimental group (only they will be able to log on), we want to know if students in the control sat next to them or looked over their shoulders outside of class.

- For students in the experimental group: how many hours did they spend working on class assignments? In class? Offline? How useful were the assignments? When, where and how did they watch the podcasts? Were the podcasts useful? In what ways did they use them? What other resources did they use?

- What is the workflow involved as faculty and students generate podcasts for the knowledge base?

- What is the workflow and activity of the technical staff involved in creating and maintaining the infrastructure for podcasting and for maintaining the podcast knowledge base?

We plan to develop the podcasting module in the summer working with the faculty member overseeing the course and the two doctoral students who will be teaching the course four times during the 08-09 academic year (See Appendix A for a draft rubric for evaluating podcast projects – a part of the module). We will
develop as sample list of topics that students could use for their assignment and a template that will
simplify the creation of a script. We will also develop several sample podcasts to serve as examples for the
students. This activity will have as a goal promoting information and technical literacy taking into account
that (Educational Testing Service, 2007; 4)

ICT literacy can best be achieved through experiences that integrate cognitive and technical learning.
Single focused, stand-alone curricula, whether academic or technical, will limit the learners’
attainment of ICT literacy. ICT literacy skills need to be integrated appropriately into curricula
addressing cognitive skills as well as those addressing IT and technical skills in order to ensure
improved ICT literacy.

We will be making use of the Faculty Podcasting Initiative grant that we received in the spring to obtain
some basic equipment that will allow students to begin podcasting; in this proposal we are requesting
funding to obtain equipment to set up the infrastructure for post-production, storage and the streaming of
high quality podcasts in a variety of formats for a variety of devices. Students will generate the initial set of
podcasts for the knowledge base in the fall 2008 and spring and summer 2009 versions of the class. The
doctoral students will teach the podcasting module early in the semester and assign small groups to create
podcasts about basic tasks, competencies, and skills associated with the main sections of the course. These
podcasts will cover technical issues (how to validate a web page, how to use basic UNIX commands) and
information fluency issues (how to find useful digital information resources, how to access and critically
evaluate digital information) that will be due near the end of the semester. Other topics could include
creating databases, exploring social computing, working with the IU computing infrastructure, ethical
issues in the use of digital information and, of course, creating podcasts. At the same time, we will be using
equipment requested in this proposal to create, edit, store, organize and stream podcasts of the classroom
lectures, discussions, and labs. The equipment will also be used to edit student podcasts for consistency.

We will then run a field study in the fall 2009 and offer S401 in two formats. One section will be taught as
it was taught in the spring and summer term and the students will not have access to the podcast knowledge
base (although they will still be taught how to create podcasts). In the other section, students will be shown
given access to the podcast knowledge base and at the beginning of the term; Napier will restrict access
to the knowledge base for the spring term to students in this section who can then make use of the podcasts
as they see fit.

We will use a multiple method approach gathering quantitative and qualitative data to evaluate the impacts
of the production and use of the podcasting knowledge base on learning, teaching, and the work required to
maintain it:

1. Baseline skills assessment: Pre and post course questionnaires designed to assess familiarity with various
technologies and basic computer and information literacy skills will be administered. This will be one way
to gather data about the ways in which their competencies and understandings change over time.

2. Student performance: Do the faculty evaluations of the assignments differ between the two groups? For
assignments that received scores and grades, are there differences? By the time we run the field study, we
will be able to compare groups of students from three previous versions of the course (fall ’08, spring ’09,
summer ’09).

3. Student satisfaction: We will gather data from student responses to a course evaluation conducted by
BEST. The survey will be administered to all of the Spring 401 students with additional questions for those
who used the podcast knowledge base.

4. Student, faculty, and staff reflections: Post course interviews will be conducted with students who used
the podcast knowledge base to gather qualitative data about their uses of the resource and the work
involved in contributing to the resource. The doctoral students who will teach the class and the technical
staff who maintain the infrastructure will also be interviewed to gather data about the ways in which their
work changed as a consequence of the introduction of this technology.
5. Support staff and faculty workflow: Both PIs will be deeply involved in the work required to create the pedagogical strategies and technical tools necessary to integrate this technology into the class and create and maintain the podcast knowledge base and will use participant observation techniques to describe what is required to get the work done efficiently and effectively.

6. Longer-term impact: One or more focus groups will be conducted during the spring ‘10 semester with students from the experimental section to gather data about their reflections on the experience and find out they continued to use the resource or recommend it to others.

In short, we are interested in studying the effects of student involvement in the creation and use of podcasting on performance and satisfaction in technical courses, the ways podcasting affects pedagogy and faculty practice, and the impacts is has on the work of technical staff who must support and maintain the infrastructure for podcasting. This work can have important ramifications for faculty in other Schools and departments considering the integration of podcasting into their pedagogy. It will make clear the benefits and challenges posed to teaching and learning by this technology as well as provide evidence of the work and costs that are involved in creating and maintaining the infrastructure to support a major investment in and commitment to podcasting as an educational technology. What is learned from this work will be transferable across domains and disciplines.

Dissemination plan

We plan to write two articles based on this work. The first will describe the creation of the student-generated podcast knowledge base and employ a social informatics perspective to analyze the impacts of the podcast module on student, faculty, and technical support staff workflow and practices. The second article will present the analysis of the field study comparing the two versions of S401 that will run in spring 08. In addition to the comparative analysis of the survey and interview data gathered from the students in the course, the article will present analyses of interview data with the doctoral students teaching the two sections and the technical staff supporting the podcast knowledge base infrastructure,

The research team will also present results of the work in the first phase of the project at SOTL in Spring ’09, reporting on the creation of the podcast knowledge base, our experiences with the podcasting module in the course, and the progress in development of the knowledge base. In spring ’10, after the field study is completed, we will present the results of research and discuss plans for the follow-up work involving a comparison of online and offline versions of the course. Rosenbaum will present the work at ISSOTL and ASIST emphasizing findings about technology, teaching, and learning and Napier will submit a proposal to present at the Apple Web Developer conference emphasizing the work involved in creating the technical infrastructure to support the generation, storage, organization, and streaming of the podcasts in the knowledge base. On campus, he will give a Tech Talk for Campus LSPs and propose a talk to the CIO Cabinet series.

Evidence of prior SOTL activity

Since 2000, Rosenbaum has been recognized for his innovative use of technology in teaching:

Lilly Award to Create New Entrepreneurship-Oriented Courses and Seminars Encouraging Entrepreneurial Thinking and Action. Johnson Center for Entrepreneurship and Innovation (2005)

Frederic Bachman Lieber Memorial Award for Teaching Excellence (2005)

MIRA Award for Technological Innovation in Education. Techpoint. (2003).


The Trustees Teaching Award from the School of Library and Information Science. (2001).
Sun Microsystems Academic Equipment Grant for "Developing a virtual economy for teaching electronic commerce" (2000).


He sits on the SOTL Advisory Board, has presented at SOTL and has published and presented work on pedagogy, technology and the teaching of electronic commerce.

Budget narrative

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xserve (8core 8GB Raid1 300 quad FCAL parts support)</td>
<td>1</td>
<td>$10918.00</td>
</tr>
<tr>
<td>Capture camera</td>
<td>1</td>
<td>1,100.00</td>
</tr>
<tr>
<td>Final Cut software</td>
<td>1</td>
<td>499.00</td>
</tr>
<tr>
<td>Profcast software</td>
<td>1</td>
<td>60.00</td>
</tr>
<tr>
<td>Capture station (Apple Mini)</td>
<td>1</td>
<td>1,080.00</td>
</tr>
<tr>
<td>Video-production workstation</td>
<td>1</td>
<td>5,574.00</td>
</tr>
<tr>
<td>GA video editor 10hr/week 45wks/yr $10/hr</td>
<td>1</td>
<td>4,500.00</td>
</tr>
<tr>
<td>Research Assistant 10hr/week 45wks/yr $10/hr</td>
<td>1</td>
<td>4,500.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$28,231.00</strong></td>
</tr>
</tbody>
</table>

The equipment requested here is needed to set up the technical infrastructure to support the ongoing creation of podcasts by students (for the knowledge base) and the technical staff (to tape the class lectures and discussions). With this infrastructure we will be able to efficiently produce, store, and stream large numbers of high quality podcasts. The “Xserve” will be the main server used to produce, store and stream the podcasts in different formats to different devices. The “Capture camera” will be used to record faculty during class. “Final cut” is software used for post-production of podcasts by the GA video editor and “Profcast” is software used by the faculty to synch presentation slides and voice narration (these files will also be available in the knowledge base). The “Capture station” takes a feed from the camera and sends it to a predefined workflow on the server. The “video-production workstation: will be used by the GA video editor for video-post-production of the audio and video sources of the class lectures: the video and audio of the faculty presentations, the Profcast presentations, and ipods recording class discussions. We are not requesting equipment for students to use because this has been covered by the UITS Faculty Podcasting Initiative grant. We are also not requesting funds for travel because this will be covered by SLIS.

The research assistant will help develop and pretest the instruments, be responsible for administering the surveys, conduct some of the interviews, gather and analyze data, and work with the co-PIs on articles and presentations. We hope to hire a SLIS doctoral student for this position.

References

http://site.educ.indiana.edu/LinkClick.aspx?fileticket=gfs0hqi2TGo%3D&tabid=1439&mid=2456


Volume 5, Number 1
http://www.ncolr.org/jiol/issues/viewarticle.cfm?vollD=5&IssueID=16&ArticleID=74
Fact sheet: What are the effects of podcasting on teaching, learning and technical support in a hands-on technical computer literacy course?

Participants
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Research plan and time schedule

Summer ’08
Set up and test equipment
Develop podcast module faculty and doctoral student AIs
Develop survey instruments with Campus instructional Consulting and BEST
Obtain human subjects clearance
Pretest instruments

Fall ’08
Administer pre-course survey to S401 students
Record class lectures
Run podcast module
Students generate podcasts
Administer post-survey, interviews (after class ends during exam week)

Spring ’09
Analyze data
Assemble podcast knowledge base on server
Administer pre-course survey to S401 students
Record class lectures
Run podcast module
Students generate podcasts
Administer post-survey, interviews (after class ends during exam week)
Present preliminary work at SOTL

Summer ’09
Add podcasts to knowledge base
Analyze data
Administer pre-course survey to S401 students
Record class lectures
Run podcast module
Students generate podcasts
Administer post-survey, interviews (after class ends)

Fall ’09
Administer pre-course survey to S401 students
Two sections will be taught one with and one without access to podcasts
Run podcast module
Students generate podcasts
Administer post-survey, interviews after class ends (after class ends during exam week)

Spring ’10
Conduct focus groups with Fall ’09 students
Add podcasts to knowledge base and make podcasts publicly available
Analyze data and write up results
Present final work at SOTL
Present work at American Society for Information Science, ISSOTL, Apple Developers Conference

**Impacts on teaching and learning**

Teaching: illustrate the opportunities and challenges of that accompany the introduction of a new educational technology (that can be shared across disciplines); provide a template for the integration of podcasting into the curriculum; improve faculty’s technical skills; create a knowledge base of podcasts that can be used as a basis for an online version of the course that we hope to pilot in 2009

Learning: improve students’ information fluency; enable students to create and produce high quality podcasts; provide students with skills, knowledge, and experiences that will be important in their professional careers
Appendix A:

Rubric to assess quality of podcasts (and other multimedia)

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Low: 0-35%</th>
<th>Medium: 36-70%</th>
<th>High: 71-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional component</td>
<td>The majority of the project is incomplete.</td>
<td>Includes part of the components (title and instructional content).</td>
<td>Includes all necessary components: title, audio, instructional content, completion of task</td>
</tr>
<tr>
<td>Design of storyboard</td>
<td>Storyboard is incomplete and does not provide a blueprint</td>
<td>Storyboard is missing important components (roles for actors, description of task)</td>
<td>Storyboard provides a clear script and complete description of the task</td>
</tr>
<tr>
<td>Design of podcast</td>
<td>Podcast was irrelevant to the instructional module and did not follow the storyboard.</td>
<td>Only parts of the goals of the instructional module were served.</td>
<td>Accomplished its intended instructional purpose and followed the storyboard.</td>
</tr>
<tr>
<td>Professionalism: Ability to present material in a professional manner</td>
<td>Presentation distracted from instructional goals. Multiple instances of inappropriate communication.</td>
<td>Presentation is on target. Basic communication but effective</td>
<td>Effective verbal and visual communication. The instructional activity was highly interactive.</td>
</tr>
<tr>
<td>Presentation: Displays knowledge of field; voice is audible and clear; easy to follow material</td>
<td>Poor display of knowledge of material. No attempt to manipulate timing, flow, transitions. Production errors not eliminated.</td>
<td>Acceptable display of knowledge of material. No obvious errors. Elementary efforts to control timing, flow, transitions. Project meets the assignment criteria.</td>
<td>Effort to achieve high production values is clear. Presentation approaches professional quality. Project goes beyond assignment criteria.</td>
</tr>
<tr>
<td>Aesthetics: Sensitive to principles of good podcast design and successful use of project criteria; creative; inventive</td>
<td>Text and visuals are too simplistic, cluttered and busy. Content does not support objectives. Little or no creativity or inventiveness. Difficult to see and hear</td>
<td>Text and visuals relate to audio. Graphics reinforce content and demonstrate objectives. Easy to see and hear</td>
<td>Skillful handling of text and visuals creates a unique and effective presentation. Effective and functional audio, text and visuals. Overall was appealing</td>
</tr>
<tr>
<td>Extra credits</td>
<td></td>
<td></td>
<td>Uses any of the following: music, humor, graphics or any other components showing the designer made a significant effort to produce it. Showed significant evidence of originality and inventiveness</td>
</tr>
</tbody>
</table>

Score

Adapted from Wang (2006) and University of San Francisco (2008)