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A Robust Electronic Thesis and Dissertation Program at UCF

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Overview

The University of Central Florida (UCF) began approximately three years ago to create an electronic thesis and dissertation (ETD) submission process that would enable students to disseminate their research widely and quickly. This research bulletin complements a recent ECAR research bulletin by Joan Lippincott which reported that “putting a collection of institutional intellectual output on the Web turns out to be a project that requires some changes in institutional policies and practices as well as the support of a wide range of stakeholders across campus” (Lippincott, 2006, p. 1). This bulletin highlights how UCF implemented the ETD process and discusses the necessary policy and procedural changes, including those that were unexpected, and the work now being done by graduate students in multimedia. The use of videos to provide just-in-time training to graduate students is covered in detail. Although UCF was late in the adoption of ETDs relative to other universities, we were determined to learn from them and to make a workable process that was as automated as possible. The guiding principle was that “new technologies can substantially encourage creativity, experimentation, and exploration and can literally transform the types of contributions to knowledge made in theses and dissertations” (Grigg, 2003, p. 1).

Having seen that many of the challenges that other universities faced were more cultural than technical, UCF decided to focus on getting broad faculty input from the beginning. We discovered along the way that providing faculty and student support at surprisingly high levels was critical to success. At UCF, ETDs have been required for nearly three years, providing globally accessible research for our faculty and students.

Highlights of Implementing ETDs

UCF prides itself on its use of technology in its instructional programs, student services, and academic processes. The university was founded in 1963 with a fundamental belief that technology could be used to improve communication and understanding.

Getting Started

The ETD program at UCF was conceptualized with the notion that faculty, staff, and key stakeholders—the UCF Library, the University Writing Center, the Division of Graduate Studies, and Office of Instructional Resources (OIR)—were essential partners in working through both technical and legal issues. The first step was to form an ad hoc committee of faculty members and others to discuss the key issues in adopting ETDs. The committee also made university-level policy and procedural decisions about how ETDs would be implemented. In selecting faculty members, we identified those who were strong dissertation advisors; those who were opinion leaders and could influence other faculty in adopting the new processes; those from the arts who were using the computer to create, edit, and display art; and the chair of the Faculty Senate. Others involved in the discussions included the library director, the chief information officer, the graduate dean, the director of instructional resources, and the associate director of graduate studies.

The following issues were systematically addressed:

- *Technical and archival.* What software will be supported, and how? How can we ensure that the dissertation is archived adequately? How can we be sure that the dissertation can be migrated to new software that is archived for all time? How will the ETDs be disseminated?
- *Philosophical, legal, and intellectual property.* Will ETDs make it more difficult for our students and faculty to be published elsewhere, since the results are immediately and widely available on the Internet? What is the value and promise of the ETD?
- *Procedural and policy.* How do we go about the implementation? How long should the implementation take? What will be needed in terms of training for students and faculty, and how much will it cost?

Technical and Archival Issues

Technical and archival issues were the most easily addressed. We carefully studied models at Virginia Tech, the University of Florida, and the University of South Florida. We also referenced the Networked Digital Library of Theses and Dissertations—the NDLTD—and its recommendations about standards, preservation, training, and policy issues. UCF wanted to create the electronic work and catalog, disseminate, and preserve it electronically.

Our first question was, what software could and would we support? We focused on selecting software options that we could adequately support. Our decision was to guarantee support, at least at first, for limited media software¹ that would ensure that the ETDs would have consistent formatting (using Adobe PDF as the standard document type format) and could be successfully stored and archived.

Intensive discussion took place concerning our most important decision: how to safeguard the archival material and how to migrate to future software products as the need arises. Our discussions centered on which entity should serve as the archiver: UCF, a third-party vendor, or a consortium of universities. The University of South Florida held the Third International Symposium on ETD in 2000, and the Council of Florida graduate deans met twice during 2003 to discuss the ETD and archival possibilities. Florida and UCF graduate deans agreed that it would be best to allow the Florida Center for Library Automation (FCLA)—a center that coordinates statewide library issues—to be the archiver for all Florida university ETDs. The FCLA confirmed that it would guarantee archiving and migration of the above media formats at no charge to UCF or the student.

In addition, UCF decided to further ensure the safety of archived material by sending electronic versions of dissertations to ProQuest for long-term maintenance of digital copies. Since these discussions, Amazon.com has begun distributing dissertations held by ProQuest for those authors who have not placed copyright or publication restrictions on their work. These authors receive royalty payments as if their work had been

purchased directly from ProQuest. UCF also created a one-step submittal process for students, with submittal to FCLA, which would then submit to ProQuest.²

Our next major concern was the level of student support needed to successfully use the ETD. Discussions about providing student support for the preparation of ETDs resulted in the OIR's becoming a strong partner with Graduate Studies to provide this support. UCF had an existing facility created for faculty that provided multimedia assistance with classroom materials. Using an existing facility allowed UCF to adopt the ETD much sooner and at lower cost than would have been required for creating a new facility. OIR agreed to allow ETD students to use the Faculty Multimedia Center and the Digital Image Processing Laboratory for production and preparation of ETDs and related components. The intent was not to assist with the physical creation of the work but to assist in the assembly of completed materials into the final ETD format. The Faculty Multimedia Center³ would assist students in compiling the thesis and dissertation components into a "finished" state and convert it to acceptable ETD formats. The Faculty Multimedia Center provides one-on-one production help, tutoring, and training; software training sessions; graphics development assistance; CD-ROM production assistance; audio-video production (audio-video tape, disks, and streams), and file-conversion assistance (for example, MPEG to AVI). The Digital Image Processing Laboratory⁴ augments the imaging requirements of 2D and 3D capture and manipulation for thesis and dissertation purposes.

Philosophical, Legal, and Intellectual Property Issues

The discussion of the fundamental nature of an ETD was essential in defining what UCF was trying to do for its graduate students. Is the ETD a series of links, and if so, how does the reader navigate the "document"—or is it a text document with limited multimedia that we make accessible on the Internet? We wanted to take full advantage of the electronic medium to develop, communicate, and then disseminate the ETD, while simultaneously providing structure for the reader. Nontraditional theses and dissertations that rely heavily on multimedia components may have limited text. A key discussion of the committee was about how to ensure that potential audiences would understand the structure and organization of an ETD that might conceivably consist of a series of links. Each student and advisor pair ultimately decides the overall organization of the work: however, the committee agreed that all ETDs would need a structure consisting of an abstract, electronic table of contents, electronic list of figures and tables, and a list of Web addresses used within the ETD. For links, the content of the link had to be adequately explained in the body of the thesis or dissertation so that the integrity of the document would not be compromised should the link fail.

We spent considerable effort discussing publication and copyright issues, a major concern at other universities. The ETD is widely accessible and available worldwide, unlike more traditional theses that are bound and deposited in a library. Some journals insist rigorously on first publication; book publishers may not be as concerned since many dissertations are revised substantially before being published as a book. We examined the information from Virginia Tech's 1999 survey, which found that 62 percent of journal editors and publishers would welcome manuscripts derived from print

dissertations, and 83 percent would not consider an online thesis or dissertation widely available through a Web-based archive to be prior publication. Virginia Tech also surveyed its alums and found that 100 percent of those who had successfully published had not had any difficulties with the publication process because the ETDs were readily available online.

Providing publication options for students that would allow them to choose their option based on their understanding of the policies of their disciplinary journals was of great importance, and ETD policies and procedures were designed to serve UCF faculty and students. The committee decided to provide unlimited access to bibliographic information and the abstract, with the option to access the entire work, which would be placed in the ETD archive using one of three dissemination options.⁵

We decided that information about obtaining copyright needed to be made available to students as creators of the work, so a link on our ETD Web site provided Library of Congress information about how to copyright original works. In addition, Graduate Studies created a Web site to familiarize students with publisher and copyright issues (<http://www.graduate.ucf.edu/pagegen/index.cfm?PageID=139>).

Procedural and Policy Issues

Communicating our preliminary conclusions was important in gaining the cooperation of the faculty, students, and university stakeholders. The University Graduate Council, the Dean's Council, and the Faculty Senate were involved in these discussions. The Faculty Senate requested an update the following year to ensure that the processes and policies adopted were working smoothly.

In the first semester of implementation, nearly 60 percent of students voluntarily submitted their theses and dissertations electronically. The trial run was very smooth, and in the next year the ETD was required. UCF no longer handles paper copies of theses and dissertations.

Graduate Studies needs to be very involved in all deliberations, setting policies and procedures by which theses and dissertations are submitted and approved. Its Web site (<http://www.graduate.ucf.edu/sitemap/index.cfm?RsrcID=55&SubCatID=144>) provides online materials that instruct students about manuscript preparation and includes a template, sample manuscript pages, and helpful resources. These materials were updated with all aspects of ETD formatting and requirements. In addition, Graduate Studies agreed to present workshops each semester providing an overview of the UCF thesis and dissertation process, informing students of best practices in managing their own thesis or dissertation and detailing resources available to students.

In addition, OIR agreed to offer workshops on ETD preparation, applying styles, and reviewing related formatting in order to successfully convert Microsoft Word documents to PDF.⁶

The implementation of the ETD has been remarkably smooth. This section highlights some of the issues UCF encountered in the two years since start-up.

The first surprise occurred when OIR was overrun by 100 students in the last weeks of the first semester that ETDs were required. Students were having problems converting their dissertations to electronic formats. This problem did not occur during the trial-run period. We suspect that during the trial run those who felt most comfortable with electronic formats volunteered to produce their work incorporating multimedia.

OIR started keeping a log of the various difficulties and determined that the majority of problems stemmed from students' not being able to format text files that could be easily converted to ETDs. The anticipated problems with using various multimedia did not materialize, as students appeared to be more comfortable with multimedia than text. Graduate Studies hired a graduate assistant to work in OIR, and OIR began offering workshops on how to create the overall file from the various multimedia components. These workshops were helpful, but they still did not reduce the heavy workload near the end of the semester.

In joint discussions with the University Writing Center, the Honors College, and Graduate Studies, OIR suggested creating just-in-time video modules for students using Camtasia Studio and making the information available to them through an OIR Web site (<http://www.oir.ucf.edu/ETD.htm>). All of the other offices link to this site, including the University Writing Center. This site is often the first contact for graduate students who are starting their dissertations. So far, six modules have been created that last no longer than 10 minutes each. They address the following issues:

- **Video 1. Introduction to the Word Interface.** Basic tasks and toolbar functions.
- **Video 2. Styles.** Style functions in Word and how they are best applied to the text of a thesis or dissertation document.
- **Video 3. Creating a Table of Contents.** Creation of a table of contents and how to modify and update it.
- **Video 4. Creating a List of Figures/Tables.** Creation of captions for diagrams and tables; creating tables to summarize research data.
- **Video 5. Formatting Pagination.** Creation of section breaks between chapters; creation of headers and footers for each section; and finalizing pagination to include tables, figures, images, and so forth.
- **Video 6. Creating the PDF File.** Creation of an Adobe Acrobat PDF file; selecting the correct settings; reviewing file elements to be sure the process is complete.

UCF has been accepting ETDs for nearly three years. UCF scientists and engineers are asking that we support LaTeX as a standard document format for their disciplines; support for this tool is currently in development.

Most faculty members have been very supportive of the ETD. Creative Writing faculty are concerned about any dissemination of their students' work on the Web, and they have asked for a full discussion in the Graduate Council of the dissemination options. Often now, particularly in the sciences, students publish journal articles before they write their dissertations. Universities, including UCF, are using simplified formats for the dissertation that allow use of multiple journal articles to form the body of the dissertation, with front and back matter that tie together the journal articles in a cohesive dissertation. In this instance, students must obtain permission from publishers to include their journal articles in their dissertations, and this becomes a larger issue with worldwide ETD dissemination.

What It Means to Higher Education

UCF prides itself on the information fluency and technological literacy of its faculty, staff, and students. Students who produce electronic documents as part of their learning experiences gain essential skills for employment and career development.

The benefit to faculty of producing this scholarship in electronic form is the wider and faster dissemination and use of the research. Faculty at UCF have shown more interest in the writing of these documents since the ETD became required, and now many more people read their students' work as published ETDs and use it in their research. Therefore, the quality of the ETD has and will continue to improve. Another benefit to faculty is that the scholarship produced electronically needs fewer formatting changes from journal to ETD and from ETD to journal, saving time for faculty and students.

The key benefit to both faculty and students is that many UCF degree programs such as Texts and Technology; Film and Digital Media; Studio Art and the Computer; and Modeling and Simulation use multimedia to better represent their ideas. Students in the Theatre program prepare DVD recordings of their performances as a part of their thesis publications. Music students include AVI files of the performances and PDFs of the scores of their compositions. Students in Film and Digital Media programs submit interactive DVD games as a part of their thesis requirement. Students in Studio Art and the Computer develop research projects that use time-based media, performance art, video art, sound works, kinetic sculpture, computer-based art, and art using the Internet in order to understand how these forms are driving 21st-century artistic practice and informing our understanding of contemporary cultural identities. Students in these and other degree programs include video streams as part of their electronic data records and could not publish their new media theses and dissertations were it not for electronic publishing formats.

A requirement for making these processes work for the benefit of faculty and students is the integration and teamwork of the University Writing Center, the UCF Library, the FCLA, OIR, and Graduate Studies. Our partners have also changed their business

processes. UCF's Thesis and Dissertation Office now reviews and approves ETD submissions online, using e-mail and Web delivery of information and services,⁷ eliminating the need for face-to-face meetings. Students often conduct their ETD meetings with their advisors and committee members at a distance via the Web. The University Writing Center provides phone conferences and online service for thesis and dissertation students, reaching more students earlier in their academic programs and helping them develop their writing skills. OIR offers special help and self-instruction video modules.

The Faculty Center for Teaching and Learning and OIR are now engaged in providing graduate teaching assistants with current information about ETD training opportunities each semester during required orientation programs, before these students begin their instructional assistantships. These teaching assistants are able to communicate to thesis and dissertation students early about the ETD process and inform them of available resources. In addition, the teaching assistants incorporate best practices for electronic document preparation into the courses they teach. UCF has plans to consolidate information into an ETD hub on the myUCF Web portal so that communications can be easily pushed or directed to thesis and dissertation students.

Key Questions to Ask

- What is the nature of an ETD? Is it a collection of digital files? Is there a structure that can be used by readers to navigate the ETD?
- What software could be supported to ensure that the materials written can be archived and remain archived for years to come? Which entity should serve as the archiver, and is it capable of maintaining and upgrading the original materials for years to come?
- What training, software, and hardware are necessary to ensure that students and faculty can efficiently produce an ETD that uses the best technologies to communicate their ideas?
- How will intellectual property issues be handled? What options should be provided to students for dissemination of their original work?

Where to Learn More

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Endnotes

1. The following formats were adopted initially:

| Medium | Preferred | Acceptable |
|-------------|-----------|------------|
| Text | PDF | |
| Still Image | TIFF | JPEG, GIF |
| Audio | WAV | MP3 |
| Video | AVI | MPEG |
| Database | MDB | |
| Spreadsheet | XLS | |

2. The one-step submittal process for students consisted of uploading the document to a UCF Library server. An e-mail notification would be sent to the Thesis and Dissertation Office, notifying Graduate Studies that an ETD was in the library's queue for review. Once reviewed, the Thesis and Dissertation Office would notify the library that the ETD could be released. The UCF Library would then attach the

student's metadata in XML format (dissertation title, student name, college, degree program, degree, advisor, date of dissertation defense, keywords to assist in cataloging the ETD, and an abstract) to the ETD, catalog it, and then send it to the FCLA, which would then send it to ProQuest according to the archival option chosen by the student.

3. The Faculty Multimedia Center houses both PCs and Macintosh hardware, film/slide scanners, flatbed scanners, CD and DVD writers, digital cameras, color and black-and-white printers (both paper and transparency materials), Windows Media encoding, and audio and video streaming. The software housed in the center includes Acrobat, Illustrator, InDesign, Photoshop, PageMaker, Authorware, Director, Dreamweaver, Flash, Freehand, Excel, FrontPage, PowerPoint, Publisher, Word, and Camtasia Studio.
4. Its hardware consists of a Kodak Image Link scanner (140 pages per minute, double-sided, grayscale only); Kodak Digital Science Color 3590C document scanner (75 pages per minute, double-sided), Epson 1640 flatbed scanner with transparency adapter, slide scanner, and digital cameras. The Digital Image Processing Laboratory's software is Adobe Photoshop.
5. The three options are:
 - a. Immediate worldwide dissemination with no restrictions.
 - b. Dissemination with limited access (UCF community and library patrons, including interlibrary sharing and release to ProQuest) for a period of time up to one year, with an option to renew the restricted access.
 - c. Pending dissemination of the entire work for six months for patent or other proprietary issues, with an additional six-month extension available. Once patent or proprietary issues were resolved, then students could choose from the above two options.
6. OIR offers workshops on the following topics: beginning, intermediate, and advanced Adobe Photoshop; image scanning techniques; document scanning techniques; beginning, intermediate, and advanced PowerPoint XP; Camtasia Studio; and Macintosh software techniques.
7. Graduate Studies e-mails general ETD information to all doctoral and master's thesis students at the beginning of the first enrollment term of dissertation or thesis hours. The office also e-mails faculty advisors, program directors, and staff every term with essential details. Programs use college thesis and dissertation listservs to announce their students' thesis and dissertation defenses. In addition, Graduate Studies hosts best practices discussions to gather feedback from faculty/staff and to inform the graduate faculty and staff about the ETD process.

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