

ONE YEAR WITH DIGITAL DISSERTATIONS

OFFICE OF GRADUATE STUDIES, THE UNIVERSITY OF TEXAS AT AUSTIN

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Abstract

The University of Texas at Austin instituted the requirement for digital submission of doctoral dissertations beginning Summer 2001. The first full academic year under digital submission has been completed. This paper relates the experiences of the Office of Graduate Studies as the digital submission process unfolded over the academic year. The process of digital submission was accomplished successfully, with fewer than expected troublesome cases, and yet with numerous adjustments to be made for the future.

The Numbers

Three graduation periods, in the months of August, December, and May resulted in the submission of 639 doctoral dissertations. Of those, 629 were submitted in digital format, and 10 were submitted in traditional paper format, with the paper format submissions being allowed only in those cases for which digital submission placed an undue non-academic hardship on the student.

History of Digital Dissertations at the University of Texas

Doctoral student Leslie Jarmon in 1996 petitioned the Graduate Assembly to allow submission of her dissertation in CD-Rom format. A brief demonstration of the dissertation, which dealt with the use of hands as a means of additional communication while speaking, resulted in approval of Ms. Jarmon's petition but more importantly, also resulted in the establishment of an ad hoc committee to investigate the future of digital submission.

To the surprise of the Graduate Assembly, the ad hoc committee recommended not just the option of digital submission, but rather the full requirement that all dissertations be submitted in digital format. The advantages of digital submission, principally in the opportunity to portray the dissertation story in ways that could never be accomplished on paper alone, were quickly recognized. The concerns, however, were numerous, including, but not limited to, those over intellectual property, international access, consistency with UMI practice, technological obsolescence, and quality control.

The Graduate Assembly in 1998 approved the ad hoc committee recommendation requiring that all doctoral dissertations be submitted digitally. Though digital submissions were accepted prior to the opening date, the first date of required submission was for graduation in Summer 2001.

Digital Submission Requirements

The Office of Graduate Studies is responsible for implementing a procedure for collecting, reviewing, and delivering to UMI the large volume of submitted dissertations. Though the procedure is evolving in its detail, an ongoing process, itself, which is expected to continue indefinitely as technology changes, basic submission requirements have established a workable framework as evidenced by the large volume of dissertations accepted. This section is devoted to discussion of the basic submission requirements.

The breadth of possibilities for digital submission ranges from the simple delivery of the floppy disk upon which a standard paper dissertation is created to a full blown HTML work entirely dependent upon modern computer technology for transmission of the doctoral research message. Further, the software employed in the production of the dissertation varies across a wide spectrum of products, not all of which are supportable by a single system. And then there is the problem of matching UMI format for the traditional publication of the dissertation.

1. Portable Document Format (PDF)—UMI requirements include submission in a format which is compatible regardless of the software which originally produced the dissertation. The software choice at the University of Texas is Adobe Acrobat. Having created the dissertation on proprietary software, MS Word or Word Perfect, for examples in the case of a classic textual presentation, the student uses Adobe Acrobat to convert the file into a portable document format. The converted PDF file is the required submission to the Office of Graduate Studies in fulfillment of dissertation completion.

2. Intellectual Property—The advent of web publication creates new issues with regard to intellectual property and the accompanying copyright concerns. Many students simply file their dissertation with UMI to meet their university's requirement that the dissertation be "published". Other students, however, encounter copyright concerns both of their own making and of the making of their particular field of study. At issue is the ready availability through UMI of the "published" dissertation over the web. Students complain that traditional publishing houses are now reluctant to engage a work which is immediately and essentially free over the web.

A second case occurs, frequently in engineering and the natural sciences, in which the student, in order to complete doctoral degree requirements, is required to actually have published, or to have under formal peer review, one or more scholarly journal articles. If already published, then use of that scholarly material verbatim or essentially in full in the larger dissertation to be "published" by UMI is of copyright concern. Increasing numbers of programs in engineering and the natural sciences are allowing the dissertation to simply be several, usually three, scholarly journal articles arranged in tandem, in which case the copyright concerns increase.

Intellectual property lawyers of the University of Texas, acknowledging that web based copyright concerns are less than clear cut at present, prepared an intellectual property tutorial for the use of graduate students and faculty. The Office of Graduate Studies maintains the tutorial online, and the online generated documentation for having completed the tutorial successfully is one item in the submission package for filing the digital dissertation.

3. Individual Document Review—Each dissertation is reviewed by a Doctoral Degree Evaluator in PDF format to insure that the appearance of the digital submission is consistent with the requirements of UMI and, more importantly, with the standards of the University of Texas. The review is not of the substance of the dissertation, that function being entrusted to the student's dissertation committee, but rather of the general format, inclusion of mechanical necessities such as title page, and an actual paper signature page certifying successful completion of the dissertation. The dissertation must pass the scrutiny of the Doctoral Degree Evaluator before the student can be certified as having completed all of the requirements for the doctoral degree.

The degree evaluator views the digital submission while the student waits. Some simple adjustments can be made in real time, and evaluators do make those adjustments on students' behalf. Should significant adjustments be in order, the student is informed, and shown on-screen, of the nature of the problem and is given instructions for how to effect corrections. It is then the student's responsibility to make the necessary adjustments and present the dissertation for a second review. Degree evaluators make every effort to provide each student with information sufficient for the student to readily complete the dissertation acceptably. Some students are simply not far enough along in the conversion to PDF process to warrant assistance which would, in effect, represent the degree evaluator doing the conversion work instead of the student.

Principles of the Digital Dissertation Requirement

The obvious difference between a dissertation on paper and one in digital format is that the degree evaluator can review the paper document knowing that, complete with signature page, the dissertation submitted is one of sufficient quality and appropriate presentation to be certified as completed by the faculty who sign. A digital submission offers neither assurance and therefore leads to the need for some guiding principles, without which the digital dissertation requirement cannot reasonably be enforced.

1. Supervising Committee Warrants the Quality of the Dissertation—A digital dissertation may appear much different than a standard prose dissertation. Multi-media, HTML, and other approaches which are marked departures from the time-honored linear presentation of the dissertation argument, are the responsibility of the student's dissertation committee. The Office of Graduate Studies, more than before, trusts the dissertation committee to adjudicate the quality of the dissertation. Some departments may choose to maintain the classic linear approach; others may choose to allow, and even encourage, great latitude in terms of the presentation of doctoral research. Prior to the requirement for digital submission, the Office of Graduate Studies regarded quality control of substance to be the responsibility of the dissertation committee. Now, the Office of Graduate Studies regards quality control of substance and quality control of presentation to both be the responsibility of the committee. This one principle, that the Office of Graduate Studies essentially is trusting faculty on the dissertation committee to deliver a dissertation of which the University of Texas can be proud, solved the myriad of quality assurance concerns which arose with the onset of implementation discussions.

2. Version Submitted = Version Approved by Committee—The ready ability to make changes in the digital submission raises the question as to whether the diskette, or CD-ROM, or other physical version of the dissertation is, in fact, the one which the supervising committee approved. Thought was given to having the student's supervisor submit the digital version on behalf of the student, but that burden, given the conversion to PDF, was viewed as too bureaucratically demanding of faculty. Just as the faculty is now trusted to assure the quality of the dissertation and its presentation, the student is now trusted to submit to the Office of Graduate Studies just that version of the dissertation which is worthy of signatures from members of the dissertation committee.

3. Quality Dissertation Trumps PDF—Though Adobe Acrobat creates a PDF for the vast majority of dissertations, there are some cases in which the conversion simply cannot be accomplished. The several unsuccessful conversion cases encountered during the year involved texts which employed unusual print fonts. The cases were in Classics and Hebrew Studies, departments which regularly make use of specialized fonts supported by software uniquely designed to deliver appropriate print. Entreaties on the part of Office of Graduate Studies staff with departmental faculty and software designers for the unique fonts lead to the conclusion that very little would change in the near future.

Another case involved a dissertation in the Department of Molecular Biology in which the traditional departmental approach to paper presentation of certain material would not successfully convert into PDF.

It is anticipated that other unique demands which cannot be converted to PDF at present will be discovered. In the cases which do not lend themselves to conversion, the determining principle is that the dissertation will be submitted on paper in traditional fashion. The student who completes a quality dissertation is not to be denied degree completion and is not to be unduly burdened by the mechanics of digital submission.

There are, however, students who simply have not devoted a reasonable effort to the PDF conversion. Doctoral Degree Evaluators recognize the insufficient efforts of students quickly, having previously experienced the type of conversion required for the dissertation in question. In the insufficient effort cases, students are counseled to refer to the Office of Graduate Studies web site and are directed to the several help sources available in the campus environs. An occasional student suffers from computer fright and becomes temporarily incapable of understanding what needs to be done to accomplish the PDF conversion. Incapacitation occurs, understandably, most frequently under the deadline pressures for graduation. Inability to accomplish the PDF conversion due to computer fright or temporal pressure forms of incapacitation does not warrant paper submission of the dissertation.

Staffing for Digital Dissertation Submission

A four person administrative team performs the functions necessary for required submission of digital dissertations. The staff consists of an Associate Dean, a Senior Systems Analyst, and two Doctoral Degree Evaluators. All of the staff performs Office of Graduate Studies duties well beyond those associated with digital dissertations. It is estimated that 20% of the staff time is devoted to digital dissertations in a given semester, though that percentage jumps to virtually 100%, especially for the Doctoral Degree Evaluators, in the last three weeks before each submission deadline.

In the normal course of events, the Doctoral Degree Evaluators deal directly with students in terms of corrections and modifications required to achieve an acceptable submission. In many cases, the adjustments are made by the evaluator on line while the student waits. As mentioned earlier, more extensive adjustments are accompanied by both technical suggestions and referral to available help desks. The Senior Systems Analyst becomes involved when the conversion problem is one not previously encountered. The analyst frequently suggests a solution for the conversion, and the analyst, the student, and both evaluators work out the steps to be taken for the submission to become acceptable. Each such episode involving the Senior Systems Analyst becomes a learning experience for the administrative team.

The Associate Dean becomes involved only when the Senior Systems Analyst and the Doctoral Degree Evaluators cannot solve a particular conversion problem. Occasionally, the Associate Dean assists in discussions with upset students who have been temporarily incapacitated, as noted earlier, and whose actions are disruptive of both the work flow through the office and the office in general. When forced to make a judgement call on whether to accept a dissertation on paper or whether to allow a digital submission which can be made acceptable only with extensive effort on the part of the student, the Associate Dean refers to the three guiding principles stated above. Under those principles, difficult decisions have thus far been made in comfort.

An unanticipated benefit of requiring digital submission of dissertations has been increased efficiency in processing students and their dissertations at deadline time at the end of the semester. The May 2001 deadline found a waiting list of 20-25 students over each of the last three days for submission. Sixteen students were processed after the doors were locked at 5:00PM. The May 2002 deadline found waiting lists of no more than 5 or 6 students, and there was only a single student to process after the doors were closed. Admittedly, the sample of a single year's experience is no guarantee of future efficiency gains, but the entire administrative staff is quite surprised, if not a little stunned, at how well processing was accomplished.

Problems and Concerns: Answers and Solutions

The following are a series of problems and concerns, both anticipated and unanticipated. In each case, the manner in which the Office of Graduate Studies treated the issue is included. The treatments are not necessarily viewed as optimal, though some were fully satisfactory in practice.

1. Advertising the Digital Submission Requirement—Simply announcing and then further advertising the digital dissertation requirement proved to be a significant undertaking. Both secular and academic venues for announcement are employed as is, of course, the electronic media. The list below includes those approaches currently in use.

Office of Graduate Studies Web Site—includes announcement of the submission requirement plus links to the assortment of help pages designed to guide students through the process.

Bi-weekly Graduate Students Newsletter—electronic.

Graduate Coordinators Newsletter—electronic.

Annual Day-long Dissertation Workshop—sponsored by the Office of Graduate Studies.

Daily Texan—student newspaper.

Austin American Statesman—local newspaper.

Announcements and ongoing contact with departmental administrators and faculty continued for at least one year before the digital submission requirement went into effect. As a result, there were relatively few students and faculty who were surprised. With a year's experience in hand, the Office of Graduate Studies is now able to focus efforts on streamlining the system and providing increased levels of support for students and faculty alike. The principal focus is on improving the level of assistance offered over the web.

2. Student Resistance—There has been no aggregate student resistance to the digital dissertation requirement. Individual resistance is, however, common. The resistance fades quickly when the student is informed of two points. First, student creation of the PDF file insures that UMI will make available to persons interested in the dissertation just what the student wanted readers to see. Paper submission leaves the format of the offerings to interested readers up to UMI. Second, digital submission eliminates copying and binding costs, a major reduction in the overall expense of filing one's dissertation.

3. Faculty Resistance—There has been even less faculty than student resistance to the digital submission requirement. The few cases have been ones in which the student's frustration with PDF conversion was transmitted to the faculty supervisor. As soon as a solution is found such that the student can proceed with completion and filing, faculty resistance disappears. One interesting practice is that many faculty require paper submission for their review purposes. Reports are that it is faster to review a dissertation on paper than on a computer screen. The Doctoral Degree Evaluators in the Office of Graduate Studies indicate that the digital review is faster than the paper review, but that belief is tempered by the understanding that the evaluators are not reading for topical content.

4. Digital Submission vs. Paper Submitted Digitally—The Doctoral Degree Evaluators admit to struggling with recognition that the dissertation is now in a digital world rather than still being in a paper world with the paper being viewed digitally. There are quality digital representations which, when printed on paper, become distorted and, in some cases, unreadable or unrecognizable. Whether to require the student to present a dissertation which not only looks good in digital format but which also looks good on paper, is an ongoing debate among the administrative staff. The current policy, in keeping with the principles outlined above, is that a dissertation which is acceptable in digital format is acceptable regardless of how it looks when printed on paper.

5. Departmentally Unique Submissions—Customary practice in differing departments may result in digital submissions which appear awkward on the screen. One example is facing pages and parallel footnotes which are common in presentations in the biological sciences. In these cases unique to traditional treatment in particular subject matter, the issue becomes one of quality appearance on paper but difficult translation into the digital representation. The current policy is to honor departmental custom, even though the digital product may be of lesser presentational quality. It is anticipated that software improvement over time will increase the ability to reproduce unique departmental practice in quality digital format.

Administrative Outlook

The primary understanding from one year's experience with the digital dissertation submission requirement is that unanticipated situations will continue and that such will continue at an increasing pace. As more and more departments encourage the breadth and depth of digital submission available to students, increasing adventures and misadventures into the use of multi-media for the dissertation will lead to new demands on the Doctoral Degree Evaluators. The Office of Graduate Studies is comfortable that the principles noted above will adequately guide decisions to be made with regard to difficult submissions. At the same time, not only will students become more creative in their use of the digital world, but so will the capabilities of the ever expanding world of software. As a result, the computer savvy requirements of Doctoral Degree Evaluators will increase.

The Office of Graduate Studies examined the possibility of direct electronic submission of dissertations and found the problems to be sufficiently complex to warrant delay of electronic submission in favor of the current digital requirement. It is anticipated that electronic submission will require the hiring of an additional staff member to handle the ongoing digital submissions while freeing up the Senior Systems Analyst to develop the electronic submission capability.

As the year wore on, staff were encouraged to discover that help desks, both commercial and on-campus, were becoming available as a result of student demand rather than at the urging of the Office of Graduate Studies. The on-campus computer lab is currently preparing to schedule specific digital dissertation assistance periods. The anticipation is that the digital dissertation submission will continue to entice purveyors of assistance. The Office of Graduate Studies, though comfortable and delighted with on-campus assistance for students, is taking a wait and see attitude concerning just how much help the commercial entities will offer.

Finally, as students and faculty supervisors become more accustomed to viewing the dissertation experience with digital submission in mind from the start, the mechanics of submission will become less burdensome, and the focus will be on what digital capability can do for the research and analysis being rendered. Use of the full breadth of multi-media will be encouraged and embraced by the Office of Graduate Studies.

Annotated References

1. Jarmon, Leslie H., An Ecology of Embodied Interaction: Turn-Taking and Interactional Syntax in Face-to-Face Encounters, Doctoral Dissertation, University of Texas at Austin, July 1, 1996.

Ms. Jarmon's request to file her dissertation on CD-ROM began discussions leading to the current requirement that all dissertations be filed in digital format.

2.Scholarship in the Electronic World, Virginia Tech, 1998.

This publication is of a seminar series at Virginia Tech dealing with the basics of electronic publishing and intellectual property among other informative issues concerning electronic theses and dissertations. It is a highly recommended background reference.

3. <http://www.utexas.edu/ogs/etd/index.html>

University of Texas at Austin Office of Graduate Studies Electronic Dissertation Website includes links to history, creating the PDF, and publishing the dissertation.

4. <http://www.lib.utsystem.edu/copyright/>

University of Texas at Austin Intellectual Property Tutorial.