ETDs and Graduate Education: Programs and Prospects

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Higher education groups like the Council of Graduate Schools (CGS) have been examining US graduate education in an attempt to understand where improvements are needed. Many critics of graduate education would echo the sentiments of Lee S. Shulman, President Emeritus of the Carnegie Foundation for the Advancement of Teaching, who recently wrote, "Doctoral preparation remains a striking example of faith-based education… Our practices in doctoral education are a combination of longstanding traditions, replications of how we ourselves were trained, administrative convenience, and profound inertia."[1] One of the areas where this is most striking is in the dissertation stage of doctoral education. There is growing concern both about the length of time for candidates to complete their dissertations, and completion rates, particularly in the humanities. Often advisors and members of a student's doctoral committee, who completed their own doctoral work in a pre-Internet era, interact with and guide their advisees in the same manner that they were treated when they wrote their dissertations. Generally, graduate students are advised to produce straightforward text dissertations that do not take advantage of new technologies.

For years now, virtually every dissertation in the United States has been created in electronic form, yet students may still be required to submit their work in very precisely specified paper form and their institution may only keep bound print copies as part of the institution's permanent record. The electronic thesis and dissertation initiative was launched in the early 1990s to change this. As part of an electronic thesis and dissertation (ETD) program, services are put in place for electronic submission of the thesis or dissertation to the graduate school or other designated academic unit, and for subsequent ingest into a repository managed by the institution's library. Generally the

institution has articulated a set of processes (including the documentation of approvals) and standards specifically for ETDs.[2] At a few schools we are seeing elements of an ETD program being approached at a system or consortial, rather than institutional, level.

Brief History of ETD Development

Beginning in the early 1990s, the Coalition for Networked Information (CNI) has been active in the ETD movement. Working with Virginia Tech, University Microfilms (now Proquest/UMI Dissertation Publishing, a unit of Gale Cengage Learning), and the Council of Graduate Schools, CNI co-hosted one of the first ETD conferences in 1993 in order to explore the potential of electronic theses and dissertations as new forms of scholarly communication and as drivers for the development of digital libraries. Digital theses and dissertations offered pragmatic examples that could help advance work on the architectures, standards, access, and preservation issues in digital libraries. In addition, ETDs provided a potential opportunity for broader culture change by introducing faculty and graduate students (future faculty) to authoring, design, and reviewing issues in innovative scholarly content that employed images, sound, datasets and databases, interactive software components, and other enrichments to traditional, primarily linear text. Since that time, work has been ongoing within the ETD community at both an institutional and cross-institutional level to develop tools, standards, best practices, and instructional and support strategies.

In parallel, Proquest/UMI Dissertation Publishing, which has been in the business of distribution of microfilm and print copies of dissertations since 1938, has evolved its services to keep pace with the developments in digital libraries and access to content on the Internet. Proquest will ingest electronic theses and dissertations directly from authors or will provide a service to digitize print dissertations. They continue to make copies available, by fee or subscription, to individuals and institutions, and also provide authors an option to pay for open access publishing, which enables any user to have free access to the content. In addition, they provide preservation microfilming services and offer digital preservation; they serve as the Library of Congress's official offsite repository for digital dissertations. Many institutions use Proquest as part of their ETD digital-archiving strategy; some continue to use Proquest as the primary platform for their ETD programs.

CNI's ETD Survey

While much of the earliest discussion of ETDs was centered in the United States, the concept has gained considerable global uptake. As well as numerous institutional adoptions of ETDs worldwide, some countries have established national-level ETD policies and strategies. As a founding and active member of the Networked Digital Library of Theses and Dissertations (NDLTD) organization, CNI has been involved in these developments on a continuing basis. At NDLTD annual conferences, individuals representing universities and other groups come together to discuss developments related to ETDs. By the 2007 conference, it was apparent that some countries, for example Australia and the Netherlands, were making great strides in implementing national ETD programs.[3] In the US, due at least in part to our highly decentralized system of higher education, some institutions had moved quickly and aggressively, while others continued to debate the pros and cons of such a program. At CNI, we wanted to better understand the state of progress of implementation of ETD programs in US universities and colleges and also wanted to learn what factors were facilitating or inhibiting ETD adoption. We were also eager to gain insight into whether ETD programs were being treated as a way to simply manage paper dissertations by other means (much like the situation today with scientific journal articles, which are distributed and stored digitally, but still conform very close to the historical printed articles in terms of content and organization). We developed a survey to collect data to better understand the state of ETD deployment in US universities and colleges.[4] The survey was sent to one institutional representative from each CNI higher education member; often this was the library director or the head of digital library programs. The results of the survey may be biased due to this factor—while many ETD programs are collaborations among the library, the Graduate School, and other units, our responses came predominantly from the library community.

The US higher education members of CNI (a subset of the membership) were asked to complete the survey in spring 2008, and responses were received from 88 (62%) of the 142 institutions contacted. Of respondents, 64 (73%) reported that they had instituted an ETD program and an additional 5 institutions stated that they were planning such a program. Note that for the remainder of this article, the percentages given pertain to the institutions that have implemented ETD programs, not to the total number of survey

respondents. Most institutions reported that the library, not the faculty or academic administration, took the lead in developing electronic thesis and dissertation (ETD) programs at their institution, although in many institutions it was a collaborative initiative, often also involving the graduate school administration. This in itself suggests that grassroots demand for the greater authoring flexibility of the digital media arising from graduate students and their faculty dissertation committees has not played an overwhelming role in advancing ETD adoption. In 43% of the institutions, the ETD program was mandatory for both doctoral and masters students, an additional 10% stated that submission of an ETD was mandatory only for doctoral students, and around 14% stated that it was mandatory only for students of specific colleges or departments.

ETD Repositories

An essential library contribution to the implementation of ETD programs has been the provision of repository services that can store, provide access to, and preserve electronic theses and dissertations. This can be done through locally developed systems, through consortially developed systems, or through agreements with commercial firms. Around 89% of institutions reported that ETDs were a part of their institutional or consortial repository holdings. Many libraries consider that the institutional repository serves both as the basis of the access strategy and at least a component of the preservation strategy for theses and dissertations. In our survey, institutions could chose multiple answers for how they manage preservation of ETDs: 69% reported that they preserve them in an institutional or consortial repository, 47% replied that they relied on Proquest to preserve a digital copy, and 5% reported using LOCKSS. Clearly, some institutions are using multiple strategies for preservation.

As open access content in repositories, ETDs are indexed by major search engines and thus readily discovered via Web searches (as well as more specialized catalogs); the full text is available worldwide without fee. Some institutions implementing ETD programs have reported massive levels of use (thousands, or even tens of thousands of downloads) from around the globe. In the past, printed dissertations and theses had more restricted visibility and accessibility, via interlibrary loan (other than theses and dissertations in one's home institution) and via commercial services, notably Proquest.

Embargoes of ETDs

The broad availability of theses and dissertations in electronic form has raised concerns among a small number of sectors of the academy. Some graduate students have been warned by their advisors or threatened by publishers that if they allow open access to their work, it will preclude future publication of the content in certain journals or as a monograph. The key issue is that certain publishers consider that openly accessible theses and dissertations constitute publication. Disappointingly, the most prominent and vocal of these publishers seem to be primarily scholarly and professional societies, where one might hope for greater alignment with the broad interests of the academy. Charles B. Lowry notes that the level of concern about ETDs in repositories is often related to a fairly small number of specific disciplines, and that limited-period embargo policies, that keep the ETD from public view for a specified period of time, will often address those concerns.[5] In our survey, 87% of the institutions had a policy allowing students to request a limited-time embargo, and 10% had a policy allowing students to request a permanent embargo.

This "prior publication" issue is one that has impacted the adoption of ETD programs in the US. In the CNI survey, we asked, "In discussions among stakeholders on campus, what is your perception of the issues that **discouraged** implementation of an ETD program at your institution?" Respondents were asked to answer this question whether or not they had already implemented an institutional ETD program. Respondents could choose more than one concern, and most of them did. It is interesting to note that institutions that have already implemented an ETD program expressed more concerns by faculty and students over the prior publication issue than institutions without an ETD program. Presumably those concerns were addressed at least in part by policies such as embargo periods, and this helps to explain the high rate of availability of this option among institutions that have implemented an ETD program. Concerns about adequate technical support and general disinterest in change received the aggregate highest total of responses (somewhat important and important) for institutions without ETD programs. The results are displayed in Table 1 below.

Table 1. Selected results from 2008 survey of US CNI higher education members

	Institutions with an ETD Program		Institutions without an ETD Program	
	Somewhat Important	Important	Somewhat Important	Important
Concerns by **faculty** about public access to ETDs limiting future publication opportunities	41%	30%	35%	15%
Concerns by **students** about public access to ETDs limiting future publication opportunities	42%	20%	30%	15%
Lack of consensus about embargo policies	35%	8%	40%	5%
Concerns about adequate technical support	26%	17%	20%	35%
Concerns about additional technical skills needed by students or staff	27%	12%	30%	15%
Concerns about potential additional costs to students or institution	25%	6%	30%	15%
Concerns about digital preservation	32%	17%	35%	10%
General disinterest in change	38%	15%	35%	20%

The embargo issue is multi-faceted. Generally, publisher demands are for limited-period embargos, which in our view are shortsighted and worthy of opposition. However, their stance is at least to some extent understandable, though it certainly attests to a low level of confidence that the publisher adds any value through its contributions and thus seems particularly surprising in the area of humanistic monographs, where there is typically a vast difference between a published monograph and the dissertation upon which the monograph is ultimately based. And there are other sensible reasons for temporary embargoes, notably to allow for patent filings.

It is interesting to briefly examine some of the justifications that are raised for very long-term (e.g., duration of copyright) or permanent embargo from public access. These primarily revolve around two concerns. The first one is the protection of exchanges between the author and a publisher (either for reputation in the case of a scholarly publication, or perhaps even for real financial gain in the case of something like a work of fiction or poetry produced for a creative writing program).

A second, less discussed concern is that, by making visible through public access on the Internet copyrighted material owned by others and reproduced in the thesis or dissertation, this will create copyright infringement liability. In essence, the hope is that if the dissertation is "locked up" no one will notice, or at least no one will care about potential copyright infringement, but if the material is easily located (say via a search engine) the author and/or the institution might have to defend an infringement lawsuit by claiming fair use. Or, the author might have to spend time (and perhaps money) clearing permissions for uses that exceed fair use as part of the thesis-writing process, creating an additional workload—if, indeed, they can clear the permissions at all. Often these kinds of questions have not been explored in traditional printed theses (though they sometimes come up as part of the process of moving from thesis to monograph), and both graduate students and the faculty advising them have little expertise in this area. Libraries are increasingly establishing services to assist faculty and student authors with understanding and addressing these types of intellectual property concerns. Note also that there are some particularly problematic issues that arise in the performing arts, where there may be issues about clearing rights of public performance of a dance work, a play, or a musical piece if open access to theses is required.

Long-term or permanent embargoes rise to the level of institutional policy: should institutions permit degrees to be awarded on the basis of work that is not made public, or that is made public only in the most limited of ways (by allowing physical inspection of a printed copy at the institution)? This is a fruitful area for community consideration both at the institutional and disciplinary level.

Non-Text Formats in ETDs

As discussed earlier, we were interested in gauging the extent to which institutions allowed various non-textual formats within ETDs. These formats could include images, sound files, videos, databases, simulations, data sets, and other items. We found that 43% of the institutions surveyed permit students to submit some types of non-text formats that are institutionally defined and enumerated, as part of an ETD. 32% allow students to submit materials in arbitrary and unconstrained formats. There is an interesting connection here between institutional preservation strategies and the digital formats that are accepted, and it parallels the situation for institutional repositories broadly:

the more extensive and diverse the set of formats accepted, the less likely that the repository will be able to offer services beyond bit-level preservation for most of the formats across time.

What we don't know (and this is a place where data would be valuable) is how many authors take advantage of these opportunities to include non-textual materials at institutions that permit this. We do know that less than a third of respondents noted that the ability to include non-text features was an important issue that encouraged implementation of an ETD program in their institution. One might speculate that this reflects the publication practices of many faculty, who continue to generate their work largely in text formats. Or, it is possible that our students need additional support, for example from the library and information technology professionals on campus, to fully exploit relevant technologies that could enhance their scholarly work. It is also possible that since librarians were the predominant group completing this survey, they may not be directly aware of the importance of the inclusion of non-text materials to various departments in their institution. At its annual conference, NDLTD gives awards to graduate students who have authored innovative ETDs, and examples of the types of materials used by these students can be seen in their work, linked from the NDLTD Web site.[6]

Needs of Graduate Students

Many university libraries are making a renewed effort to provide services and technology-rich spaces for graduate students. Institutions such as New York University, University of Minnesota, and University of Washington have studied graduate student needs for library and information services using a variety of techniques.[7] The kinds of support that graduate students desire are likely to vary by institution and by discipline. Each institution should have mechanisms in place to gather needs-assessment data, and it would be useful to better understand what specific needs students have at the thesis or dissertation stage. Note that an institutional policy decision about the unacceptability of long-term embargoes may well play an important role in shaping these needs, particularly with regard to advice about copyrighted materials. E-research is also giving rise to new demands for help. While students often include appendices with survey instruments and tables of data, the large volume of data associated with e-research methodologies has not generally been included as part of the dissertation. One institution becoming active in this area is Oregon State

University, which is working with selected departments in the sciences on the processes and requirements for including large data sets associated with dissertations into the institution's digital repository.

A recent publication from the Council of Graduate Schools, *PhD Completion Project: Policies and Practices to Promote Student Success,* has identified a number of areas where institutions can work to enhance the graduate student experience and the completion rate of graduate degrees.[8] For example, students' program environment can be enhanced through development of a network of support and outreach, interdisciplinary interactions (academic and social), and informal social activities. The curricular process can be enhanced by writing programs, a dissertation retreat / boot camp, and a collaborative doctoral student writing room. Unfortunately, the recent CGS report does not mention the library's role in supporting these kinds of activities (or, indeed, even to note some of the areas such as intellectual property advising where libraries are particularly well positioned to help), but clearly the library does have much to contribute.

Libraries are already developing collaborative spaces and targeting some of those for graduate students. Some information commons incorporate access to the campus writing center, and programs could be developed to specifically address the needs of thesis and dissertation writers. Libraries could play a role in hosting interdisciplinary events and could participate in dissertation retreats, focusing on the literature review, intellectual property issues, citation-management software, formatting the dissertation, and incorporating non-textual materials. Libraries can also advise students on e-research issues, providing information on best practices, development of metadata and documentation of workflows, and implications for access and preservation.

The traditional view of library participation in ETD programs has focused on their role in providing repository services. However, libraries can play a broader role in graduate education. While arranging for the institutional repository services and providing access to and preservation of ETDs is essential, there are many additional services that libraries can provide that directly assist students as they plan and write a dissertation. Such services can enhance students' dissertation experience and aid the institution by supporting students in the completion of their dissertation work.

1. Lee S. Shulman, "Doctoral Education Shouldn't Be a Marathon," *Chronicle of Higher Education*, Chronicle Review, April 4, 2010, http://chronicle.com/article/Doctoral-Education-Isnt-a-/64883/ (login required).

2. For an overview of institutional practices and policy issues, see Joan K. Lippincott, "Institutional Strategies and Policies for Electronic Theses and Dissertations," *EDUCAUSE Center for Applied Research ECAR Research Bulletin*, 2006, no. 13 (June 20, 2006): 1–12, http://net.educause.edu/ir/library/pdf/ERB0613.pdf.

3. Presentations from the annual, international ETD conferences are available at http://www.ndltd.org/events_and_awards/conferences; an article providing a good overview of international developments is Haya Asner and Tsviya Polani, "Electronic Theses at Ben-Gurion University: Israel as Part of the Worldwide ETD Movement," *portal: Libraries and the Academy*, 8, no. 2 (April 2008): 121–139, http://muse.jhu.edu/journals/portal_libraries_and_the_academy/toc/pla8.2.html (login required).

4. The authors thank Diane Goldenberg-Hart, Communications Coordinator, CNI, for her assistance with developing, implementing, and analyzing the survey, and Sharon Adams, Administrative Assistant, CNI, for her assistance with the survey administration.

5. Charles B. Lowry, "ETDs and Digital Repositories—A Disciplinary Challenge to Open Access?" *portal: Libraries and the Academy* 6, no. 4 (October 2006): 387–393, http://muse.jhu.edu/journals/portal_libraries_and_the_academy/toc/pla6.4.html (login required). Additional resources addressing this issue are available on the NDLTD Web site at http://www.ndltd.org/resources/intellectual-property-issues-and-etds.

6. Networked Digital Library of Theses and Dissertations, NDLTD ETD Awards, http://www.ndltd.org/events_and_awards/awards/etd-awards.

7. Diane Goldenberg-Hart, "Enhancing Graduate Education: A Fresh Look at Library Engagement," *ARL: A Bimonthly Report*, no. 256 (Feb. 2008): 1–8; see also the presentations available for the fall 2007 ARL-CNI forum on this topic. Goldenberg-Hart's report and the forum presentations are available at http://www.arl.org/resources/pubs/fallforumproceedings/forum07proceedings.shtml.

8. Council of Graduate Schools, *PhD Completion and Attrition: Policies and Practices to Promote Student Success* (Washington DC: The Council, 2010), http://www.phdcompletion.org/information/book4.asp.

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