

The University of Western Ontario

The Electronic Thesis and Dissertation Project

A project for submission to the 2012-13 OURA Innovations Award

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Background

The Electronic Theses and Dissertations (ETD) project at The University of Western Ontario was a collaborative effort between the School of Graduate and Postdoctoral Studies (SGPS) and Western Libraries. ETD now provides a technologically advanced medium for expressing graduate student research at Western. Prior to implementation, Western theses were created by students electronically using some type of software, and then printed to paper. As these paper copies were difficult to access from outside of Western, to meet the ever increasing demand for access to Western research, this project was initiated for the purpose of developing an efficient model to make these works free and available to all interested parties while improving the methods by which the theses are collected, examined and eventually published. Western sees approximately 600 theses published each year. Each thesis evaluation and publication involves the student author, supervisor, three to four faculty examiners and an administrative coordinator.

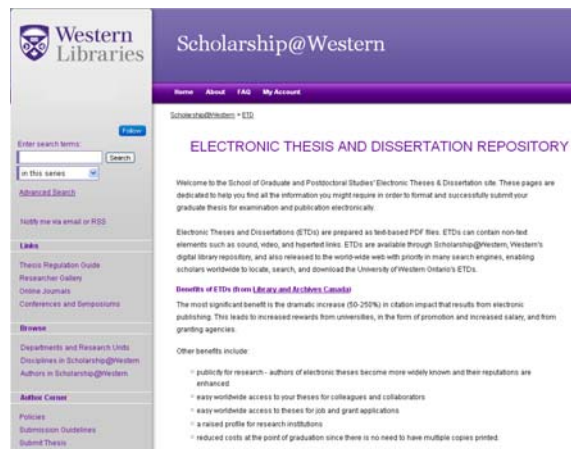


Figure 1 – Repository home page

The goals of the project were as follows:

- Facilitate worldwide accessibility to Western graduate student research
- Improve the quality of administrative work related to facilitating thesis review and publication
- Improve the potential presentation of research

- Instruct graduate students about electronic document preparation
- Collect all graduate research through one electronic portal
- Direct thesis examiners to access and complete preliminary evaluation of the thesis online
- Provide timely communications following the progression of the submission

What Makes this Project Innovative?

The full features of our ETD repository appeared to be the first of its kind implemented at a Canadian university (as concluded by our internal research). In fact, we have not yet seen any school invite all stakeholders to access all key points of the thesis evaluation. ETD has historically focused on the digital distribution of the approved work. While this feature can produce an important impact on the exposure student research receives, it only focuses on the tail end of the thesis production process. In increasing the readership recorded for our theses by a factor of 649 in the span of a year we can safely assume the project has achieved this goal.

This project aimed to expand this digital service model to include all thesis milestones after the point at which the student considers their work complete and ready to be evaluated. These processes were historically left to paper, the mail and manual labour. Considerable time, effort and money were being spent at Western on producing, distributing, evaluating and reporting on the draft version of the thesis. Faculty now embrace the concept of receiving and evaluating the thesis in a digital form, saving approximately 350,000 printed pieces of paper annually while accessing and evaluating the thesis instantly and from anywhere in the world.

Graduate students were spending a total of \$60,000 a year across campus on producing throwaway copies of their thesis. Students immediately embraced the concept of having their thesis uploaded for review in place of producing draft copies of the work and having them distributed across campus or via the mail to examiners around the world. Access to the work is made as quickly as our editor can key the examiners into the repository. The time and energy now required to maintain the entire thesis evaluation process has dropped 42% while incorporating all work that was being performed by individual departments and faculties. While the volume of theses now maintained centrally within SGPS has tripled the effort required to maintain the same level of work has been cut in almost half. Seventy departments across campus have had the responsibility of maintaining master's theses evaluations independently happily ported to SGPS. These users now only need to check the status of the thesis whenever they need to within the repository. This has saved approximately 85-115 days of work each year across campus. All the while this repository drives all communications to relevant stakeholders when the action is required.

The introduction of our repository model has allowed all thesis stakeholders to access key information in a timely and effective manner whenever and wherever they may choose in one consistent and permanent location. The project is the result of two years of tireless efforts to ensure our students, staff and faculty have the best possible experience in completing this critical stage in the academic careers of our students. Ultimately, we feel this project exemplifies innovation and excellence due to the direct improvements in several facets of the graduate education process at both the central and program levels, the impact it has had with our staff, faculty and students as well as the relative ease with which it has been adopted across our community.

Schedule

On September 1, 2011 the final phase of the project was released and the service became everyday business for Western. Technical development of the repository itself took approximately three months and required collaboration between SGPS, Western Libraries and BE Press from March 2010 to June 2010. Seeking the approval of the Graduate Education Council on the policies governing the new repository took considerably more time. Discussions and revisions to the proposed policies took approximately eight months between March 2010 and October 2010. The project was one of the first major innovations debated and approved within the new Graduate Education Council at Western. A full schedule of the project is available below in Figure 3.

ELECTRONIC THESIS AND DISSERTATION REPOSITORY

Development of Novel Nano-structured Materials with Low-Cost and High Stability for PEM Fuel Cell

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Degree
Doctor of Philosophy

Program
Mechanical and Materials Engineering

Supervisor
Dr. Andy (Dueliang) Sun

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Figure 2 - Thesis as published in repository

Project Timeline

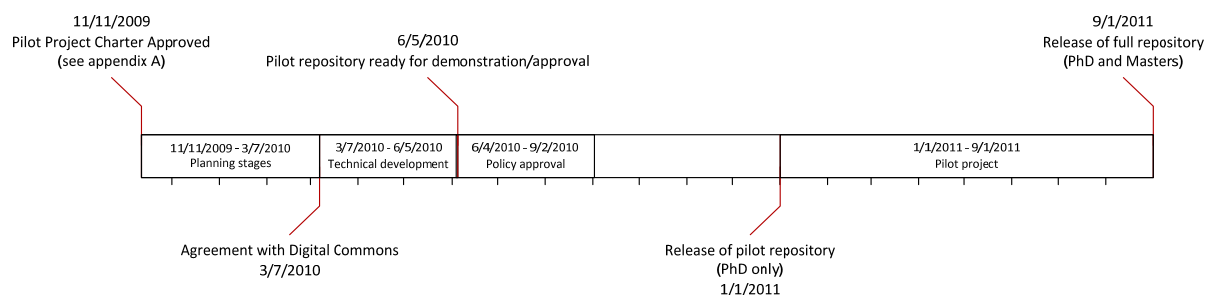


Figure 3 - Project Timeline

Reception

The release of the doctoral only pilot repository in January 2011 was done on schedule. Uptake and acceptance of the optional new process was quick (see Figure 4) and the scheduled full release of the repository, now mandatory for all graduate students, was released in September 2011 (four months in advance of the original schedule). While many schools in Canada had previously produced a method to distribute theses in an online portal, Western strived to allow the digital publication of the thesis be only one of the drivers for the project and pursued methods to improve the administrative work involving staff,

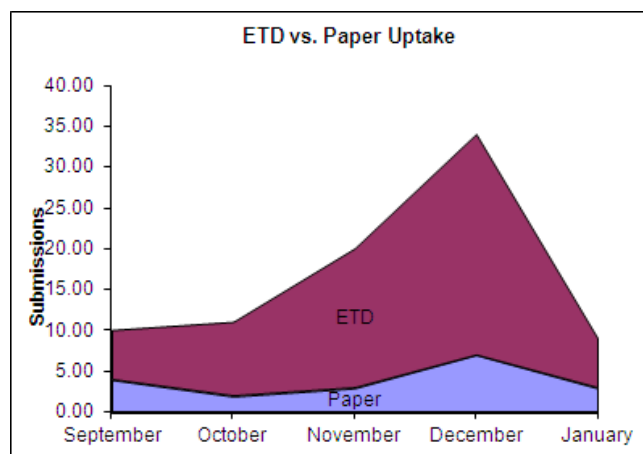


Figure 4 - Uptake of ETD by students during pilot

faculty and students across the assessment and evaluation of theses from preliminary evaluation to publication. This effort focused on digitizing the preliminary review process which has each examiner receive a copy of the thesis for initial review and automating the communications which managed the expectations of stakeholders within the evaluation process. Western has now examined the impact the project has had on both the graduate research made digitally accessible to the world and the improvements to the methods by which we manage the thesis review and publication process.

Results

Success criteria as stated in original project plan:

- **Facilitate worldwide accessibility to Western graduate student research**
 - Paper PhD circulation of theses published between October 1, 2010 and October 1, 2011 (source - Western Libraries):
 - Number of theses: 116
 - Number of circulations: 35
 - Average circulations per thesis: 0.3

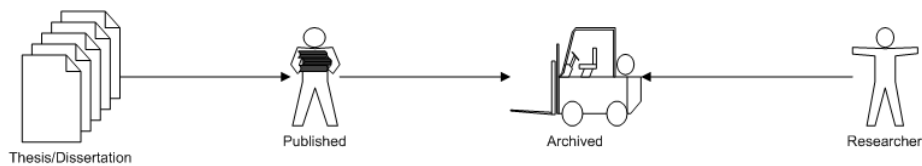


Figure 5 - Historical model for accessing archived research

- ETD circulations of theses published between October 1, 2011 and October 1, 2012 (source - Scholarship@Western ETD Repository)
 - Number of theses: 258
 - Number of circulations: 50,230
 - Average circulations per thesis: 194.7

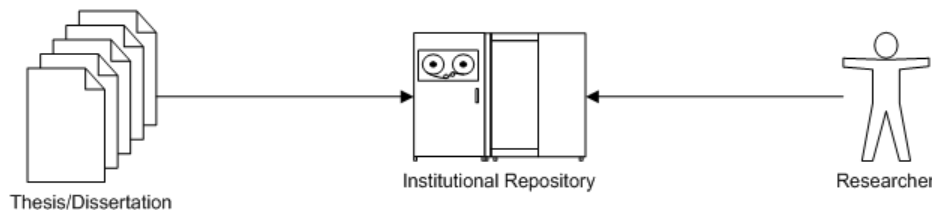


Figure 6 - ETD model for direct access to research

- Central distribution of graduate research has increased by a factor of 649
- All graduate theses now accessible through general web search engines (e.g. Google)

- Between October 1, 2011 and October 1, 2012, Western graduate theses have been viewed in 154 countries (source – Scholarship@Western ETD Repository):
 - Top five:
 - Canada – 65.0%
 - India – 6.8%
 - Singapore – 2.1%
 - Russia – 1.9%
 - United Kingdom – 1.6%

- **Improve the quality of administrative work related to facilitating thesis review and publication**
 - Students no longer responsible for providing paper draft copies of thesis for review and binding of final copy (costs estimated at \$100 per student, \$60,000 across campus)
 - Theses no longer printed and bound at final publication saving approximately 130,000 pieces of paper annually
 - Time needed to manage reception and distribution of preliminary copy within SGPS reduced from 15-20 minutes to 2-3 minutes
 - Time needed to review final submission of thesis reduced from 15-20 minutes to 2-3 minutes
 - SGPS volume of theses management has tripled with the new responsibility of overseeing both Master's and PhD thesis evaluation however overall work has decreased (300-400 hours of annual work becomes 120-180 hours of work)
 - Departments are no longer required to maintain master's level thesis evaluations removing approximately 600-800 total hours (85-115 days) of total annual work across seventy departments.

- **Improve the potential presentation of research**
 - Graduate students now have the opportunity to add dynamic multimedia and web integration as part of their thesis
 - Thesis templates (.doc and LaTeX formats) now available to all students

- **Instruct graduate students about electronic document preparation**
 - All graduate students submitting a thesis now experience an online submission and review process similar to other online peer review journal systems
 - SGPS now offers regular workshops for students promoting effective thesis strategies and practices
 - SGPS thesis regulation guide no longer the focal point for stakeholder information
 - New section of SGPS website "Thesis" provides information on all facets of thesis creation and publication
 - Students receive monthly reports on the circulation of the thesis via email

- **Collect all graduate research through one electronic portal**
 - All graduate theses at Western are now collected through Scholarship@Western
 - All graduate thesis examinations now flow through SGPS

- **Direct thesis examiners to access and complete preliminary evaluation of the thesis/dissertation online**
 - All examiners now submit preliminary reports via Scholarship@Western (~2000 reports each year) eliminating 2000 direct mailed paper reports
 - 22% of examiners request a paper draft copy of thesis
 - SGPS coordinates the printing and distribution of these paper copies
 - All examiners have access to a digital copy (.pdf) of the thesis
 - Assuming examiners are not printing copies of the thesis themselves (ignoring the free offer of printing from SGPS) approximately 350,000 sheets of paper are eliminated from annual use for the purpose of reviewing the draft thesis

- **Provide timely and automated stakeholder communications tracking the progression of the submission**
 - Examiners invited to review thesis via email
 - Reminders sent automatically to examiners
 - Graduate program assistants able to monitor progress of theses through repository
 - Student made aware of milestone events in thesis progression via email
 - ~6400 email yearly communications are now triggered as events occur and no longer require manual work relying on a department/SGPS administrator

Collaboration with Other Institutions

Since project launch, Western has demonstrated our ETD process to many schools via conferences (including OURA 2010), web seminars and internal in-person visits to Western to view the process we have in place. We feel this project has exemplified to other institutions the possibility of engaging all stakeholders in a digital workspace for theses. We remain open to sharing our work and experiences in implementing this project to all schools interested. Staff, students and faculty at Western have all embraced the results of the project and we are eager to demonstrate the improvements a service like this can have across student research and administrative responsibilities. We consider this service to be at the very forefront of solutions in the evaluation and distribution of graduate student research and hope other schools can enjoy the same successes we have encountered since launching it.