ABOUT ITEL

Since the spring of 2013, the Initiative on Technology-Enhanced Learning (ITEL)—an $8 million investment in faculty grants, digital infrastructure improvements, and a partnership with edX—has provided funding and support to Georgetown University faculty in order to bring technology-focused teaching and learning ideas to life. This initiative, one component of the capital campaign *For Generations to Come*, serves as an incubator for boundary-pushing experiments in teaching and learning, facilitating the widespread adoption of promising tools and approaches both on-campus and globally online.

162 TOTAL PROJECTS
11,360+ GU students • 226,670+ MOOC enrollees

Students by Georgetown School

<table>
<thead>
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<tr>
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<tr>
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<tr>
<td>School of Continuing Studies (SCS)</td>
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Faculty by Georgetown School

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For project videos, additional stories, and assessment data, visit ITEL.GEORGETOWN.EDU.
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FROM THE EXECUTIVE DIRECTOR

I am very pleased to present this final report on the Initiative on Technology-Enhanced Learning (ITEL). Comprising five rounds of grant-funded projects over three years, the Initiative’s activities, outcomes, and impact on our students and faculty, as well as on world-wide online learners, are wide-reaching and impressive.

This moment represents an inflection point for teaching and learning with technology at Georgetown, marking the end of a large investment in grant-funded projects and a turn toward a period of sustainability and partnership. I’d like to highlight a few of the key impacts of the Initiative that you can read more about in this report:

- ITEL funded hundreds of course-based faculty-led experiments all with the purpose of improving the learning experience of our students. On pages 12-19 we highlight findings from projects focused on games and simulations, flipped/hybrid and online learning, social and collaborative learning, and tablet and mobile learning.

- ITEL has had an impact on faculty practice with technology tools for learning. In fact, 84% of ITEL faculty report they are still using the technology or practice, and 35% say their practice or technology has spread to others (see pages 20-21 for more Faculty Impact).

- ITEL launched GeorgetownX, which has delivered 29 course offerings of 15 unique MOOCs and continues to grow. This laid the foundation for a strong online course design and development team that is now available to the entire university through CNDLS (see pages 22-27 for more GeorgetownX Impact).

- ITEL promoted rigorous project assessment and the scholarship of teaching and learning, resulting in dozens of scholarly publications and hundreds of presentations at conferences (see pages 27-31 for more Assessment and Scholarly Impact).

This Initiative would not have been possible without a tremendous amount of support from across the university. I am grateful to Provost Groves and the deans for their leadership, to University Information Services, Lauinger and Dahlgren Libraries for their partnership, and to the Georgetown faculty who spent hundreds of hours imagining, implementing, and iterating on innovative teaching and learning practices to benefit our students. I am extremely proud of, and thankful for, the CNDLS staff who assisted in every way—from vision to details—in making this Initiative a success.

The findings and lessons generated by this Initiative can enable us to strategically move forward in supporting innovative technology-enhanced learning efforts at Georgetown University, now and into the future. I look forward to continuing to collaborate with our friends and partners across the university in carrying on this important work.

Eddie Maloney
Executive Director, CNDLS
SUCCESSES, CHALLENGES, AND RECOMMENDATIONS

The Initiative on Technology-Enhanced Learning (ITEL) has, by many measures, been an outstanding success. These successes, as well as the remaining challenges, are now informing designs for sustainability of technology-enhanced learning practices at Georgetown as well as for continued experimentation and generation of new knowledge. Going forward we will work to sustain technology-enhanced learning and innovation through promoting and supporting best practices across our campuses; to continue to experiment and innovate on a smaller scale; and to partner both internally and externally to the university in order to cost-effectively address the needs of learners at home and worldwide.

Key Successes of ITEL

- **Identification** of promising areas (games and simulations; flipped, hybrid, and online learning; social and collaborative learning; and tablet and mobile learning) where technology can enhance student educational experiences and development of signature projects which are helping to guide decisions and practices in these areas.

- **Investment** in the technological and pedagogical skills of our faculty, which has had a positive impact on learning for thousands of students and has in many cases resulted in the sharing of this work through research, presentations, and publications.

- **Establishment** of Georgetown as an international leader in open online course design and the development of a robust online programming support structure that extends Georgetown’s reach, revenue, capacity, and global impact.

- **Campus-wide adoption** of successfully-piloted instructional technologies through cross-institutional collaborations with Classroom Educational Technology Services, University Information Services, and the Georgetown Library.

Remaining Challenges

- **Constraints of rapid funding cycles** create difficulty in sustaining existing projects at the same depth or in new contexts and courses.

- **Little cross-fertilization of ideas** across projects inhibits transformative change at the institutional level.

- **Promotion and tenure pressures** compete with spending time learning new technologies and with taking risks in teaching.

- **Significant development costs** of massive open online learning outweigh revenue from verified certificates.
Recommendations for Next Steps:

1. **Reward, support, and recognize teaching innovation**

   Feedback from ITEL faculty indicates that official recognition, departmental support, and a positive impact on the promotion and tenure process would be helpful in getting more faculty across campus engaged in this kind of work. Fostering a culture that rewards faculty for innovative teaching means tolerating failure, creating space within the current evaluation structure to take risks in teaching, and making it possible for technology-enhanced learning to contribute toward a positive career trajectory. This may mean revising tenure and promotion guidelines or otherwise shaping the evaluation structure to better reward faculty innovation in teaching.

2. **Support best practices for technology-enhanced learning**

   Faculty report that technical, media, and project administration support are still needed in getting faculty across campus engaged in this kind of work. In order to expand support to all faculty wishing to integrate technology into their teaching at our university, models need to be developed that are flexible, cost-effective, scalable, and grounded in best practices in technology-enhanced learning. One option under consideration is the development of a peer-tutoring center to serve as a support and innovation hub for faculty and students seeking guidance on how to use Georgetown-supported tools, including Domain of One’s Own, Canvas, WordPress, and others.

   (continued on next page)

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**“What do you think would be most helpful in getting faculty across campus engaged in this kind of work?”**

<table>
<thead>
<tr>
<th>Official recognition and/or impact on promotion/tenure process</th>
<th>CNDLS support (project administration, technical/media support)</th>
<th>Department support</th>
<th>Other</th>
<th>Financial incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>67%</td>
<td>56%</td>
<td>14%</td>
<td>7%</td>
</tr>
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</table>

*Based on a 2016 ITEL faculty survey.
Encourage institutional transformation
For transformation and widespread adoption to take place, technology-enhanced learning (TEL) ideas need to be shared, discussed, and debated among faculty across the university. Faculty-led conversations and outreach efforts can help transition the lessons learned through ITEL grants into a broad knowledge base, enabling good practices to spread organically through peer networks and community-building. This might unfold through planned Faculty Learning Communities, TEL faculty ambassadors, or department- and school-led efforts, as well as by partnering with students and other support units on campus.

Continue innovation and experimentation
For Georgetown to stay at the forefront of technological innovation and ready for the next big change in higher education, we must push the boundaries of what is possible, and be curious about how our students learn. Experiments within larger courses and key course sequences as well as at the program level—such as graduate-level micromasters certificates—would support transformative curricular change at Georgetown. To ensure that these efforts lead to evidence-based practices, ideally funding would be made available to continue to support assessment and research on how pedagogical, curricular, or technological changes impact student learning.

Pursue creative collaborations in open online learning
We will continue to develop internal and external partnerships—for example with non-governmental organizations, other universities, or centers and units within our own university—to enable Georgetown to creatively fund and design MOOCs and other online courses for a range of audiences. By refining our models of online learning and MOOC course design, we can continue to develop flexible approaches to skills development and paths to degrees, while creating re-usable resources for use in multiple course contexts, including face-to-face.

Faculty suggestions for how the university could continue to support technology-enhanced learning:
• Create an ITEL alumni community
• Reach junior faculty
• Have dedicated tech specialists for each department or field
• More visibility for ITEL projects and case studies
• Continue to offer cohort opportunities
• Workshops highlighting best practices from GU and beyond
WHAT ITEL GENERATED

- **Reusable course resources** that enable new practices inside and outside the classroom (videos, iBooks, screencasts and lecture captures, specially-developed software, simulations, GeorgetownX MOOCs used in on-campus classes)

- **Online peer engagement and community-building** (online peer review, ePortfolios, online galleries of student work, social media apps)

- **Openness to changing faculty roles** (moving from educator to orchestrator in the classroom, lab-based, studio-based, and design-based models for learning, moving from lecture to more interaction)

- **Input for campus-wide technology adoption** (Canvas, Georgetown Domains, Remark, VoiceThread, Echo360, Sharestream, 3D printing, polling software, tablets)

- **Robust infrastructure for supporting online programming** (individual course-level, program-level, open online courses)
ITEL OVERVIEW

From 2013-2016 233 Georgetown faculty participated in the Initiative on Technology-Enhanced Learning (ITEL)—more than twice the number as projected—reaching over 11,360 Georgetown students and enrolling over 220,000 global online learners. Through five rounds of funding, ITEL supported 162 grant projects focused on teaching and learning with technology. These projects included 55 medium-sized Open Track projects, 99 smaller Cohort projects, and the development, launch, and re-run of dozens of GeorgetownX MOOCs.

162 projects
233 faculty
11,360+ GU students
226,670+ global learners

ITEL GRANTS

MAY 2013
Round 1
28 projects

DECEMBER 2013 • Round 2
36 projects

MAY 2014
Round 3
35 projects

DECEMBER 2014 • Round 4
24 projects

2013 2014
OPEN TRACK PROJECTS

Moderately-sized individual and collaborative faculty projects experimenting with technologies and pedagogical designs to improve teaching and student learning at the course or course sequence level.

55 projects • 140 faculty members • 8,100+ students

COHORT PROJECTS

Small-scale experimentations with new and proven educational technologies by interdisciplinary faculty groups meeting over the course of a semester.

99 projects • 81 faculty members • 3,260+ students

GEORGETOWNX MOOCS

Focused on the development, launch, and reiteration of massive open online courses reaching learners around the world.

8 projects • 15 courses • 29 iterations • 226,670+ students
GOALS, OUTCOMES, AND IMPACT

The ITEL Initiative was born out of ambitious goals: to discover and foster new ways to teach and learn through a thoughtful use of cutting-edge technology, and to make these discoveries available well beyond the physical walls of Georgetown University. These ambitions have guided the selection of grant projects, and, as a result, the far-reaching impact of ITEL is already evident on students and faculty here on the hilltop and beyond.

In the following pages, we present evidence and examples of how ITEL is enhancing student learning outcomes, impacting and transforming faculty practice, and making aspects of a Georgetown education available to global audiences through GeorgetownX MOOCs. Beyond local effects on teaching and learning, ITEL projects are part of a larger conversation, one rooted in the most lively and productive areas of research in the field of technology-enhanced learning. The outcomes of this Initiative are contributing to the growing body of research and knowledge in pedagogical and technological innovation, as evidenced through the production of dozens of papers and presentations.
ENHANCING STUDENT LEARNING

In order to meet the first goal of identifying, developing, assessing, and modeling new ways of using technology to enhance student learning, all awarded ITEL projects developed their own goals and conducted their own assessments. Assessment practices and tools ranged from student surveys and instructor observation to carefully-designed semi-experimental studies, yet all were designed to assess the impact that these new practices and tools were having on student learning. An evaluation of the 55 large Open Track projects found that the great majority—nearly 70%—had a measurable impact on student learning.

Through projects focused on games and simulations, hybrid and blended learning, flipped classrooms, global synchronous tools, open online learning, and much more, faculty have created opportunities for students to build skills essential to future professional success, such as harnessing big data, using cutting-edge research software, and implementing collaborative design-based approaches to problem-solving.

In the pages that follow, we highlight the research and assessment results from projects pushing the boundaries in the areas of:

- games and simulations for learning
- flipped, hybrid, and online learning
- social and collaborative learning
- tablet and mobile learning

The findings from these projects, and others like them, can now serve to guide the university toward sustained and widespread technology-enhanced learning practices that enable deeper student learning through engaged, playful, and imaginative solutions to the challenges facing learners today and into the future.
Games and simulations have been shown to increase engagement, motivation, time on task, and learning outcomes. Because of their promise, games and simulations, as well as other types of personalized and adaptive learning approaches, have been an area of significant attention and exploration both within ITEL and the larger field of education. Following the design and implementation of a branching simulation and two online game projects in Round 1 of ITEL, CNDLS facilitated two semesters of the gaming and simulation cohort and incorporated simulations into two MOOCs. Through ITEL, 23 faculty participated in the creation of an educational game, simulation, or interactive tutorial based on an adaptive learning framework. Many of these projects set up experimental and quasi-experimental studies to assess the impact of their new learning tools on students, finding in all or most cases trends toward more positive outcomes for students who used the game, simulation, or tutorial. Additionally, in one case, use of the simulation also resulted in greater time efficiency during lab time and fewer broken glass tubes.

Guided Instruction through Online Games

Ron Leow (Spanish & Portuguese) designed, oversaw the construction of, and studied two educational games through his ITEL project. In the first study, he conducted a randomized controlled trial to evaluate the effectiveness of an educational game designed to help students understand the complex Spanish gustar verb structures.

Seventy beginning Spanish students were randomly divided into three groups for comparison: a “guided instruction” group that played the Gustar Maze Game; a “deductive instruction” group in which a teacher explained the grammatical rules and provided the same offline practice examples as the maze game; and a control group that received no instruction. Groups were compared on three learning tasks: two “productive” tasks which measured students’ ability to produce the gustar structure orally and in writing, and a multiple-choice written recognition assessment.

While both the guided instruction (using the maze) and deductive instruction groups improved across time and outperformed the control group, the guided instruction group achieved higher learning outcomes on productive tasks and experienced greater retention of learning. An additional empirical study was conducted to study the effects of a game designed to promote deeper processing of the distinctions between the Spanish prepositions para and por. Similar results were found, with both studies empirically supporting the effectiveness of interactive games for use in a non-intensive language course.

Learn more at: itel.georgetown.edu/projects/leow/
Chemistry Lab “Virtual Build”

Ron Davis (Chemistry) created an interactive organic chemistry virtual lab using Articulate Storyline. Using the virtual lab, students were able to construct a chemistry apparatus prior to attempting the actual exercise in the physical lab. Davis assessed the impact of this exercise by splitting his students into three groups: a control group that did not use the virtual lab, a group that accessed the lab remotely from their own personal devices, and a group that used a large touchscreen version of the virtual lab.

Students who used the virtual build reported improved confidence and were able to build their apparatus in the lab to a similar level of quality to their peers, but in significantly less time (over 10 minutes more quickly than the control group). It also resulted in fewer broken glass tubes, fewer student tears, and freed-up lab time for other instruction. When aggregated across nearly two hundred students in fourteen sections of the course, this amounted to a substantial time-savings during which additional instruction and reflection could take place in the lab.

Learn more at: itel.georgetown.edu/projects/davis/

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Enhancing Student Learning

FLIPPED, HYBRID, AND ONLINE LEARNING

Hybrid, flipped, and online courses free up class time and limited instructional space, reach students at a distance, and speed up the student feedback process.⁵ They can also lead to better learning outcomes for students, partially, perhaps, because flipped courses intentionally create room for more active learning.⁶,⁷ ITEL projects were able to reap these additional benefits while finding that student outcomes were in some cases favorable to, and always at least equivalent to, traditional classes. In addition, ITEL supported the development and launch of Georgetown’s first MOOCs through edX and paved the way for significantly ramping up the design and production of online courses across the university.

Flipped-learning Model for Medical Students

Adam Myers (School of Medicine), along with School of Medicine collaborators Susan Mulroney and Jennifer Whitney, created a Georgetown Downtown Special Master's Program (GTDT SMP) that used flipped-learning courses to create a self-directed approach to learning the same materials as Special Masters Program (SMP) students on the GU Medical campus. In an unpaired t-test, the project team found that the average grade performance of the students taking the flipped-learning courses was statistically significantly higher than that of the students taking traditional courses.⁸ Similar results have been found in subsequent years of administering the GTDT SMP and comparing scores.

Additionally, the team:

- Compared incoming academic backgrounds and grade point averages of the Downtown and Traditional SMP groups and found they were very similar.
- Surveyed students about whether the lecture captures and other materials were effective for their learning, and what their attitudes were toward hybrid learning, self-directed learning, and flipped classroom experiences.
- Captured statistics about student utilization of the online materials, such as views of videos and attempts at practice tests.

Learn more at: itel.georgetown.edu/projects/myers/

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Comparable Proficiency Gained through Hybrid Learning

Donatella Melucci (Italian) and Louise Hipwell (Italian) designed a study comparing the learning outcomes of students in two simultaneous implementations of their courses, Advanced Italian I (Fall 2014) and Advanced Italian II (Spring 2015). One implementation used a hybrid format and the other used a traditional, face-to-face format. In the hybrid course, two in-class sessions were replaced with online instruction in order to attract students who otherwise could not manage the five-day-a-week class meeting schedule of advanced language courses.

The instructors aimed to investigate whether students taking a course in either format could attain a comparable level of proficiency in oral production, written production, reading comprehension, listening comprehension, grammar knowledge, and vocabulary acquisition.

Based on an analysis of baseline student language ability, performance throughout the semester, and scores on an identical final exam, the instructors found that students in the hybrid class performed equally well on the final assessments as students in the traditional course.\(^9\)

Learn more at: itel.georgetown.edu/projects/melucci-hipwell/

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Learning is more than just an individual cognitive activity; it takes place in a social context, and can be enhanced through learning designs that invite collaboration. Many web 2.0 tools—such as ePortfolios, WordPress, Omeka, VoiceThread, and Google Apps—are making it easier for faculty to implement social, reflective, and collaborative learning activities both during class time and online between class meetings. A total of 13 Open Track ITEL projects used such technologies to facilitate collaboration, group work, and social connections, but two practices in particular gained significant traction within the Initiative: (1) peer-to-peer language learning through video and text (telecollaboration), and (2) ePortfolios and student websites. This second practice was the focus of two ITEL cohorts, one on ePortfolios and the other on Domain of One’s Own. Assessments of learning in these types of projects often took a qualitative approach, finding that students reported or evidenced gains in areas such as cultural competence, confidence, and connecting life experiences to what they were learning.

**Teletandem Language Learning**

Michael J. Ferreira (Spanish and Portuguese), along with colleagues in many of Georgetown’s language departments, focused an ITEL project on promoting intercultural communication and authentic language practice. Teletandem matches students with partners in other countries through real-time videoconferencing that is based on the principles of reciprocity, segmentation, and student autonomy. Based on survey responses from students who experienced teletandem in seven different languages, an overwhelming majority (around 80%) said they enjoyed or very much enjoyed learning a foreign language through teletandem. Similar percentages of students said they would be willing to do teletandem again and would recommend this course to other students. Students reported learning most in the following areas:

- New vocabulary and idiomatic expressions
- Speaking more fluently and with more confidence
- Oral comprehension and new comprehension strategies
- Cultural information and ways of thinking about about their partner’s country and culture

Learn more at: [itel.georgetown.edu/projects/ferreira/](itel.georgetown.edu/projects/ferreira/)

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Blogging For Reflection While Studying Abroad

Betsi Stephen (Demography, SFS) investigated to what extent incorporating student blogs and ePortfolios into study abroad experiences would improve student learning in the areas of reflection, integration, and visibility. In order to assess the students’ blog posts, Stephen created a comprehensive rubric based on aspects of the following AAC&U Value Rubrics: Critical Thinking, Oral and Written Communication, Global Learning, Integrated Learning, Intercultural Knowledge and Competence, Information Literacy, and Lifelong Learning. Using the rubric, Stephen and multiple independent raters scored student blogs and ePortfolios in order to assess how well students demonstrated their abilities in these areas at the beginning and at the end of their study abroad term.

Student work was scored using the rubric criteria on a scale from 1-4, which was then analyzed to see whether each student had improved from first to final blog post. At both study abroad sites the results showed that students had improved empathy skills, connections to experience, and reflection by the end of their semester abroad. Site directors and instructors were able to use the areas in which students were not seen to be markedly improving (e.g. cultural diversity, language, and use of supporting material) to better promote these skills during students’ study abroad semester.

Learn more at: itel.georgetown.edu/projects/stephen/

“The ITEL grant was instrumental in developing our City of Florence online museum, which vividly chronicles students’ reflections of their study abroad experience at Villa Le Balze.”

— Betsi Stephen
Tablet and mobile computers are gaining a seat in higher education classrooms. This is likely because they can provide students rapid access to information and promote collaborative learning, as well as personalize the learning experience and provide an interactive and fun platform for creativity. ITL projects that focused on using tablets and mobile technology aimed to facilitate real-time markup and drawing of graphs during lecture, display and share images captured by digitally-equipped microscopes in a biology lab, and create more interactive discussions by quizzing via mobile phones and other polling devices. The popular “Deepening Discourse and Engagement with Tablet Computing” cohort ran for three semesters and attracted 25 faculty members. In this cohort, faculty used tablets to foster everything from close reading and annotation of texts to practicing medical suturing techniques. Assessments focused on student performance showed some improvement over prior years or comparison groups, and students indicated that they thought their learning benefitted as well.

Enhancing Lectures with Real-time Graphing

Arik Levinson (Economics) used a Windows tablet computer to combine static images with real-time illustrations of graphs side-by-side, and easily record his digital demonstrations using lecture capture technology as a review tool for students. This solved the significant problem he had in the past of not being able to create new graphs during class in response to student questions. In order to evaluate his students’ experience, he added supplementary questions to the year-end course evaluations, added an additional question to a year-end homework assignment, and compared final exam performances to the prior year.

Ninety-six percent of Levinson’s students agreed or strongly agreed that their learning benefited overall from the way the instructor used technology in this course. When asked specifically about the tablet’s use during lecture, 85% of students thought the tablet was a better technology than alternatives they had seen or heard about for large lectures. Additionally, exam scores were better in the ITL project year than in the year prior, both on graphing questions (the content dynamically illustrated by tablet during lectures) and non-graphing questions. However, the instructor cautions against attributing that gain to the ITL project since the tests may have differed.

Learn more at: itel.georgetown.edu/projects/levinson/

Tablet-Based Student Presentations

Jason Tilan (Human Science) and J.P. Hyatt (Human Science) sought to compare the effects of student presentations using tablet-based virtual whiteboards versus physical whiteboards in their physiology course. Students were randomly assigned to either a control or experimental group that met on separate days of the week. This course was held in Reiss 152, where extensive whiteboard space, four wall monitors, and a large centrally located monitor allow presenters flexibility and control over multiple devices. Additionally, Zoom was used to project, record (with consent), and facilitate remote attendance for all presentations.

Six features of the students’ presentations were scored by both course instructors, students in attendance, and an external reviewer. Presentations were rated on a scale from 1-7, from poor to excellent. In both semesters of the study, ratings were higher for presentations using tablets than for whiteboard “chalk talks.” Chalk talks and tablet usage will be incorporated in future iterations of this course, with the instructor noting that the number of tablets and enrollment is the greatest challenge.

Learn more at itel.georgetown.edu/projects/tilan-hyatt/

Interactively Visualizing Music

Ben Harbert (Performing Arts) and his team developed tablet software that enables students to explore and annotate timbre, dynamics, articulation, and rhythmic nuances, among other musical attributes. “My major goals were to give students confidence in their ability to listen carefully, to connect ideas from the course and readings to the sounds themselves, and to create a record of their ideas for use later in preparing for the listening-intensive final exam.”

In accessing students’ musical annotations, Harbert was able to understand how students listened, the moments in songs they found significant, and what ideas they connected to the songs. According to Harbert, it was invaluable to “get inside their ears” in a way he never had before, helping him to understand how students listen and enabling him to maintain a dialogue about listening with each individual student.

Learn more at itel.georgetown.edu/projects/harbert/
FACULTY IMPACT

The goals of the Initiative are rooted in the notion that technology use in teaching must always be in the service of the greater good of the teaching and learning endeavor—such as making more effective use of faculty time, enabling more frequent faculty-student interaction, and helping students engage in increasingly sophisticated and independent work with research materials and data using emerging tools in their fields. These and other similar goals drove faculty innovation and inquiry in their use of technology to enhance the learning experience of their students.

At the conclusion of five rounds of projects, 84% of ITEL faculty are continuing to use the tools and practices explored in their ITEL project, demonstrating that the initial investment has had a lasting impact on how faculty are using technology in their teaching. Additionally, for 36% of the faculty involved in the Open Track projects, the insights and discoveries detailed in their project reports revealed that the experience had a substantial or transformative impact on their teaching, such as learning to optimize use of class time, perfecting the process and art of online teaching, and focusing on learning outcomes.

35% of ITEL faculty report that practices they developed through ITEL are now being adopted and used by other faculty, demonstrating that a spread effect throughout the university has occurred to some extent. For instance, one large project at the Medical School has led to wider adoption of flipped classroom approaches across the medical curriculum. In nearly 25% of the projects, faculty reported that their project precipitated a change at a curricular or institutional level, evidence that ITEL has to some extent helped fuel larger transformations at our university.

WHAT FACULTY SAY about the impact of their ITEL project

- 74% It influenced how I use technology in my teaching.
- 73% It influenced my teaching practice or strategies.
- 65% I developed stronger connections with other faculty or colleagues.
- 40% It impacted my research, publishing, or speaking practice.
- 35% Other faculty have adopted a technology or practice explored in this project.
- 24% It precipitated change at a curricular or institutional level.
“My ITEL experience taught me how to rethink teaching in the classroom in three ways: (1) to better link the course topics with the learning experience of students, (2) to improve the engagement of students in the classroom, and (3) to orchestrate multiple and different learning experiences within any single class.”

– Robert Thomas, Marketing (MSB)

“This project was an excellent opportunity for me to develop my thoughts and ideas on how to use game-based technology to assist students learning Arabic. It was especially useful in allowing me to learn many aspects of several multi-media, multi-language software resources and perhaps most important enabled me to establish a professional relationship with the ITEL staff.”

– Ghayda Al-Ali, Arabic and Islamic Studies
FINDINGS AND DATA
Since joining the edX consortium in early 2013, Georgetown has developed a portfolio of 15 MOOCs that have brought the core expertise of our university to an international stage through courses like “Genomic Medicine Gets Personal,” “Terrorism and Counterterrorism,” and “Introduction to Bioethics.” These courses have attracted learners with a wide variety of motivations, goals, demographic characteristics, and experience levels.

As a Contributing Charter Member of edX, Georgetown joined a consortium of top-tier universities and gained access to a platform with more than five million active users. Georgetown’s leadership role in the edX network, which included hosting and co-directing the 2015 edX Global Forum, has helped forge a robust knowledge-sharing community around global online learning.

The MOOC course development supported through ITEL has deepened our commitment to innovative pedagogy and built connections to other institutions and students all over the world. With each MOOC launched or reiterated, we continue to embrace integrative learning outcomes, revenue-generating potential, and the flexible approaches to skills development and curricular enrichment that these types of online courses can offer.

GeorgetownX MOOCs
Demystifying Biomedical Big Data: A User’s Guide
Genomic Medicine Gets Personal
Global Business in Practice
Globalization’s Winners and Losers: Challenges for Developed and Developing Countries
Impact Evaluation (in development)
Introduction to Bioethics
Learning Design (in development)
Terrorism and Counterterrorism
Terrorism and Counterterrorism: An Introduction
The Divine Comedy: Dante’s Journey to Freedom: Part 1 (Inferno)
The Divine Comedy: Dante’s Journey to Freedom: Part 2 (Purgatorio)
The Divine Comedy: Dante’s Journey to Freedom: Part 3 (Paradiso)
Preparing for the AP Physics C: Electricity and Magnetism Exam
Quantum Mechanics for Everyone
Sign Language Structure, Learning, and Change (in development)

226,670+ students enrolled
7,252 certificates
15 GeorgetownX MOOCs
29 course iterations
LEARNER DEMOGRAPHICS

Using edX enrollment data, along with responses from surveys CNDLS administers before and after each course, we are gaining a clearer picture of the learners enrolled in our MOOCs. To date, more than 200,000 learners have enrolled from more than 200 countries across the globe. Most of our learners are full-time employees, and the majority of these learners already have an advanced degree. This is largely in line with the findings from UPenn, MIT and Harvard. However, in contrast with other universities where significantly more males enrolled in MOOCs than females, Georgetown’s MOOC enrollments tilt the other way with a slight female majority.

<table>
<thead>
<tr>
<th>By Profession</th>
<th>51% FEMALE</th>
<th>49% MALE</th>
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<tbody>
<tr>
<td>Professional</td>
<td>60%</td>
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<tr>
<td>Official/Manager</td>
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<tr>
<td>Administrative Support Worker</td>
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<tr>
<td>Technician</td>
<td>5%</td>
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<tr>
<td>Other</td>
<td>9%</td>
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<tr>
<th>By Employment Status</th>
<th>45%</th>
<th>21%</th>
<th>9%</th>
<th>9%</th>
<th>8%</th>
<th>8%</th>
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<tr>
<td>Full-time employed</td>
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<td>Student</td>
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<td>Part-time employed</td>
<td>9%</td>
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<tr>
<td>Retired</td>
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<tr>
<td>Out of work</td>
<td>8%</td>
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<tr>
<td>Other</td>
<td>8%</td>
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<th>By Education Level</th>
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<th>33%</th>
<th>15%</th>
<th>9%</th>
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<tr>
<td>Bachelor's Degree</td>
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<td>High School Diploma / GED</td>
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<td>Did not finish High School</td>
<td>9%</td>
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<th>By English Language Proficiency</th>
<th>48%</th>
<th>31%</th>
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<td>Full professional proficiency</td>
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<td></td>
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<tr>
<td>Native or bilingual proficiency</td>
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</table>
Part of the value of MOOCs is the flexibility and access they provide to a wide variety of learners with different goals and motivations for engagement. Eighty-seven percent of survey respondents stated that they came to our courses to gain knowledge and skills. More than a third of respondents (38%) were taking the course to advance their careers, 15% wanted to take a Georgetown course, and 14% were using it to supplement their university education or because no other education was available to them.

Intent to complete and earn a certificate in our MOOCs was high, with 68% of respondents aiming to earn a certificate and an additional 19% planning to complete all or most course activities, but not earn a certificate. The remaining 13% intended to focus their efforts not toward a certificate or completion but instead on aspects of the course that most interested them or to explore the material in an open-ended way.
WHERE WE’VE BEEN, WHERE WE’RE GOING

*Extending Reach, Revenue, and Capacity*

Over the past three years, CNDLS has gained extensive expertise in partnering with faculty and subject matter experts to develop a variety of online learning experiences, significantly expanding our global presence. In addition to our MOOCs, we are applying these same capacities towards the development of online certificate programs, undergraduate courses, graduate programs, and open learning professional development here at Georgetown, as well as at other area institutions and schools. This work in online learning, a natural outgrowth of our initial investment in MOOCs, has the capacity to significantly extend our reach and revenue.

*Strengthening Research Practice*

MOOCs also serve as an important catalyst for educational research. Each course generates large and detailed datasets, including information about learners’ motivations, behaviors, and learning experience. CNDLS has already developed several research projects leveraging these data, including both applied and more scholarly-driven research projects. Going forward, we look forward to strengthening our emphasis on research by exploring one or more research questions with each new MOOC.

*Innovative Pedagogical Experimentation*

Over the past three years we have also explored different structures and pedagogical models for our MOOCs. For instance, in 2015 we launched a self-paced version of Globalization’s Winners and Losers, a course format that allows students to move through the lectures and materials as quickly or as slowly as they like and download a verified certificate from the edX dashboard when they reach a passing grade.

We have also increasingly seen MOOCs as a trigger for innovation here on campus, with faculty using MOOC materials and exercises as a part of their traditional, face-to-face courses. Going forward, we intend to work closely with departments, programs, and faculty to identify ways to integrate and leverage MOOCs to add value for on-campus students.

**WHAT LEARNERS SAY**

- **95%** agreed or strongly agreed that “the course clearly communicated important learning goals.”
- **85%** agreed or strongly agreed that “I can apply the knowledge I gained in this course to my work or other nonclass related activities.”
- **86%** agreed or strongly agreed that “learning activities helped me construct explanations/solutions.”
- **87%** agreed or strongly agreed that “course activities increased my curiosity about the topic.”
EDX GLOBAL FORUM

Georgetown University and CNDLS hosted edX’s annual Global Forum on campus and in Washington, D.C., November 8-10, 2015.

This event brought together over 360 edX partner members from around the world to discuss online learning and collaboratively explore emerging trends in online education. Highlights included remarks by Georgetown Provost Robert Groves and by United States Chief Technology Officer Megan Smith, which sparked discussions on such topics as how data analysis can inform MOOC design and what role MOOCs can play in hybrid course formats.
REACHING GLOBAL LEARNERS

24% of GeorgetownX MOOC participants come from low and medium development countries*

*As defined by the UN’s Human Development Index. Enrollment data as of September, 2016.

ASSESSMENT AND SCHOLARLY ACTIVITY

Every ITEL project conducted assessment activities, including assessments of impact on student learning outcomes, student surveys exploring perceptions and experience, faculty reflections, and in some cases more formal education research projects. See the following pages for a list of publications and presentations resulting from ITEL projects.

This scholarly work has helped several ITEL projects garner public attention and recognition. For example, Betsy Sigman (MSB), along with a graduate student and four CNDLS staff, received the 2016 Innovation in Teaching Award from the Decision Sciences Institute for their teaching brief Visualization of Twitter Data in the Classroom, which was based on Sigman’s ITEL Project. The paper was published in the Decision Sciences Journal of Innovative Education (DSJIE): Volume 14, No. 4.

57 presentations at national and international conferences
20 IRB submissions
13 presentations at on-campus institutes
11 articles and conference proceeding
6 book chapters
6 iBooks
PUBLICATIONS AND PRESENTATIONS

Publications


**Presentations**


Cunningham, D. (2016, September). Verstärkung des Sprechunterrichts durch mobile technologien und peer-review. Presented at the German Teacher Virtual Conference (GETVICO), Goethe-Institut, USA.


Demaree, D., Garr, W., Rostain, T., McWilliams, M., Salah, J., Gaston, T., & Church, S. (2014, October). Developing a robust design strategy for creating an effective educational game: A collaboration of faculty, learning designers, and game developers. Presented at the International Society for the Scholarship of Teaching and Learning (ISSOTL) Annual Conference, Quebec City, Canada.


Little, M. (2015, May). Teaching bioethics through humanities. Presentation to the President’s Commission on the Study of Bioethics, Washington, DC.


Myers, A., Rostain, T., & Smith, L. (2014, May). Portable practices across our campuses. Presented at the Teaching, Learning, & Innovation Summer Institute, Georgetown University, Washington, DC.


Pankova, M. (2015, July). What can the analysis of discourse structure and appraisal choices in online course-based chats by advanced foreign language learners and native speakers tell us about telecollaboration as a venue for intercultural and linguistic learning? Presented at the International Systemic Functional Congress (ISFC), Aachen, Germany.

Park, T. (2015, June). Improving self-study quizzes with answer feedback designs. Presented at the Center for Innovation and Leadership in Education (CENTILE) Colloquium for Educators in the Health Professions, Georgetown University, Washington, DC.

Patterson, R., Titan, J., & Trester, A. (2014, May). Using technology to educate the whole person. Presented at the Teaching, Learning, & Innovation Summer Institute, Georgetown University, Washington, DC.


Strachan-Viera, S. (2016, June). Videos and their effect on student learning and engagement in a medieval philosophy and a global middle ages history class. Presented at the International Education Conference sponsored by the Clute Institute, Venice, Italy.


Yarden, R., LaRocque, J., & Gusev, Y. (2015, June). In-class immersion of ‘big data’ technologies to improve students’ understanding of genomic instability and systems biology. Presented at the Center for Innovation and Leadership in Education (CENTILE) Colloquium for Educators in the Health Professions, Georgetown University, Washington, DC.
ITYEL AWARDEES

Ghayda Al-Ali, Arabic & Islamic Studies
Frank Ambrosio, Philosophy
Kelley Anderson, School of Nursing & Health Studies
Monica Arruda de Almeida, School of Foreign Service
Tommaso Astarita, History
Elham Atashi, Justice & Peace Studies
Marjorie Balzer, Anthropology & CERES
Anja Banchoff, German
Shweta Bansal, Biology
Evan Barba, Communication, Culture & Technology
Tom Beauchamp, Philosophy
Andrew Bennett, Government
Caetlin Benson-Allott, English
Jan Blancato, School of Medicine
Roberto Bocci, Art & Art History
Douglas Boin, Classics
Rachel Brady, School of Continuing Studies
Shaun Brinsmade, Biology
Jonathan Brown, School of Foreign Service
William Buckley, School of Continuing Studies
Daniel Byman, School of Foreign Service
Heidi Byrnes, German
Donna Cameron, School of Medicine
Anna Celenza, Performing Arts
Yulia Chentsova-Dutton, Psychology
Francisca Cho, Theology
Francesco Ciabattoni, Italian
Soyica Colbert, Performing Arts
Susan Coleman, School of Nursing & Health Studies
Jeff Connor-Linton, Linguistics
Bernie Cook, American Studies Program
Jo Ann Moran Cruz, History
Joe Cunningham, German
Carl Dahman, School of Foreign Service
Diane Davis, School of Nursing & Health Studies
Ronald Davis, Chemistry
Maggie Debelius, English
Anthony DeDonna, Performing Arts
Thomas DeLeire, McCourt School of Public Policy
Matthew Devost, Computer Science
Robin Dillon-Merrill, McDonough School of Business
Veronica Donahue, School of Continuing Studies
Laura Donohue, Law Center
Kevin Donovan, School of Medicine
Friederike Eigler, German
Nada Eissa, McCourt School of Public Policy
Heidi Elmhoford, Biology
Steven Epstein, School of Medicine
Ladan Eskevari, School of Medicine
John Esposito, School of Foreign Service
C. Christine Fair, School of Foreign Service
Tina Fallani, Villa Le Balze
Hany Fazza, School of Foreign Service
Liudmila Fedorova, Slavic Languages
Michael Ferreira, Spanish & Portuguese
Kevin Fitzgerald, School of Medicine
Carol Rollie Flynn, McCourt School of Public Policy
Jennifer Fox, Biology
Emily Francomano, Spanish & Portuguese
Jim Freericks, Physics
Robert Friedland, School of Nursing & Health Studies
Mary Furlong, School of Medicine
Karen Gale, School of Medicine
Ian Gallicano, Biochemistry & Molecular & Cellular Biology
Alison Games, History
Alessandro Ghidini, School of Medicine
Mark Giordano, School of Foreign Service
John Glavin, English
David Goldfrank, History
Nady Golestaneh, School of Medicine
Nora Gordon, McCourt School of Public Policy
Yuriy Gusev, School of Medicine
Bassem Haddad, School of Medicine
Matt Hamilton, Biology
Aaron Hanlon, English
Aviad Haramati, School of Medicine
Benjamin Harbert, Performing Arts
Paul Heck, Theology
Gretchen Henderson, English
Michael Hickey, Biology
Louise Hipwell, Italian
Brian Hochman, English
Bruce Hoffman, School of Foreign Service
Jeffrey Huang, Biology
Lily Hughes, Film & Media Studies
Mike Hull, Physics
Collier Hyams, Art & Art History
Jon-Philippie Hyatt, School of Nursing & Health Studies
Martin Irvine, Communication, Culture & Technology
Bette Jacobs, School of Nursing & Health Studies
Yasmin Jilla, School of Medicine
Irene Jillson, School of Nursing & Health Studies
Michael Johnson, School of Medicine
Jessica Jones, School of Medicine
Timothy Jorgensen, Biology
Shareen Joshi, School of Foreign Service
Stacey Kaltman, School of Medicine
John Keown, Philosophy
Andreas Kern, McCourt School of Public Policy
William Kietzman, School of Medicine
Laurie King, Anthropology
John Kline, School of Foreign Service
David Koplow, Law Center
Lawrence Kromer, School of Medicine
Rebecca Kukla, Philosophy
Jan LaRocque, School of Nursing & Health Studies
Garrison LeMasters, Communication, Culture & Technology
Ron Leow, Spanish & Portuguese
Genevieve (Gen) Lester, School of Foreign Service
Arik Levinson, Economics
Sherry Linkon, English
David Lipscomb, English
Doug Little, School of Nursing & Health Studies
Maggie Little, Philosophy
Michael Loadenthal, Justice & Peace Studies
Toby Long, School of Medicine
Sue Lorenson, Linguistics

32 THE CENTER FOR NEW DESIGNS IN LEARNING & SCHOLARSHIP
<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
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<tr>
<td>Huaping Lu-Adler</td>
<td>Philosophy</td>
</tr>
<tr>
<td>Jennifer Lubkin-Chavez</td>
<td>Center for Language Education &amp; Development</td>
</tr>
<tr>
<td>Dana Luciano</td>
<td>English</td>
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<tr>
<td>Rodney Ludema</td>
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<td>Marianne Lyons</td>
<td>School of Nursing &amp; Health Studies</td>
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<tr>
<td>Peggy Weissinger</td>
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