Evaluating the Impact of the Duke University Center for Instructional Technology Faculty Fellows Program on Teaching and Learning

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Executive Summary
This report uses data collected from three recent CIT Faculty Fellowships to answer two questions:
1. Do fellowship participants change how they teach?
2. Does the fellowship program have an impact on teaching and learning at Duke beyond the individuals who participate in the fellowships?

We find that the answer to both of these questions is “yes”. People who participate in CIT fellowships significantly change how they teach their classes, positively impacting thousands of students at Duke. We also find that the fellowships create positive impacts on how other people at Duke teach. This happens because fellowship participants mentor other faculty members and become advocates for promoting teaching excellence across the university.

Description of the Fellowship Program
This report focuses on data collected from people who participated in the three most recent fellowships that focused on teaching. These were: Team-Based Learning Fellowship (May-December 2012), Flipped Classroom Fellowship (September 2013-May 2014), and Active Learning Fellowship (May-December 2015). While the three fellowships were each slightly different in structure and in the topics they covered, all three fellowships used active learning techniques to help faculty members make significant course revisions and reduce reliance on classroom lectures for instruction.

People Served
Across the three fellowships covered by this report, 34 people participated as full fellows. A list of participants can be found in Appendix A. Half of the faculty members who participated in the fellowships are people engaged principally in teaching at Duke, as shown in Chart 1.

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1 Two people participated as occasional members of one fellowship due to scheduling conflicts.
2 We did not ask participants in the flipped class fellowship whether they redesigned their courses
Non-tenure track faculty titles of fellowship participants include Professor of the Practice, Lecturer, Instructor, and Lecturing Fellow. Visiting and other temporary appointments are excluded from this category.

One-third of the participants were tenured or tenure-track professors. Three participants are no longer with Duke; all of them were in the earliest cohort of fellows. Twenty-two different departments were represented in the three fellowships.

It appears that participation has trended towards fewer tenured and tenure track faculty members. In 2012, seven participants were tenured or tenure track while eight were not. In 2015, two participants were tenured or tenure track and seven were not.

Fellowship Impacts on Participants
We collected data from fellowship participants in the following four ways:
  • Post-fellowship surveys with participants (n=19)
  • Interviews with participants in the Flipped Classroom Fellowship (n=4)
  • Focus group with Active Learning Fellowship participants (n=8)
  • Long-term follow-up surveys in 2-4 years later with participants in all three fellowships (n=12)

All the available data indicate that fellowship participants change how they teach as a result of the fellowship. For specific examples, see the Team-Based Learning Fellowship report at https://cit.duke.edu/pdf/reports/CIT-TBL-Fellowship-report-April-2013.pdf. Across all three fellowships, participants indicated that they felt they were teaching better and students were learning more because, as a direct
result of the fellowship, they were using more active learning and team-based learning in their courses.

Most participants identified a specific course that they wanted to redesign through the fellowship. Twenty-four courses were redesigned through the Team-Based Learning Fellowship and fifteen courses were redesigned through the Active Learning Fellowship\(^2\). These numbers represent only the courses that people intended to redesign when they applied for the fellowship. Sakai records indicate that many fellowship participants subsequently taught additional courses.

Several large, introductory classes that typically enroll 100 – 400 students were redesigned as a result of a CIT Faculty Fellows Program. These include:

- Biology 201, Biology 202
- Physics 141, Physics 142, Physics 151
- Statistics 101, Statistics 151
- Chemistry 101, Chemistry 110, Chemistry 201, Chemistry 202
- Environmental Science 102
- Computer Science 201

A total of 7,633 unique students took at least one class from an instructor who previously participated in a fellowship over the seven semesters from spring 2013 through spring 2016; students who took multiple classes impacted by the fellowship program were counted only once.

To quantify the impact these fellowships had on teaching at Duke, we used Sakai records to identify all the courses taught by people who participated in a fellowship, beginning in the semester after the fellowship ended. We then used course rosters to count the number of students on campus each semester who took at least one class taught by an instructor who was a fellowship alumnus. These numbers are shown in Chart 2 below.

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\(^2\) We did not ask participants in the flipped class fellowship whether they redesigned their courses because intending to redesign a course was a criterion for participating in the fellowship.
Chart 2: Number of Duke Students in Fellowship-Impacted Courses

The numbers above represent a conservative estimate of the number of undergraduates being impacted by CIT's Faculty Fellows programs because we were not able to identify undergraduates taking graduate-level courses. Anyone in a course numbered 500 or above was counted as a graduate student, although some of those courses are open to undergraduates.

We used the numbers shown in Chart 2 to calculate the percent of Duke undergraduates in at least one fellowship-impacted course each semester. The results of that calculation, based on the most recent reported undergraduate enrollment of 6,485, are shown below in Chart 3.

Chart 3: Percent of Duke Undergraduates in a Fellowship-Impacted Course
Even when courses were not significantly redesigned, fellowship participants could identify specific activities or approaches to teaching that they adopted and which improved their teaching. For example, one participant said that she prerecorded some of her lectures and felt that it gave her the freedom to be more creative and experimental during class. She previously worried that if she did not devote all her time to lecturing, she would not cover all the course material. She said the student feedback was very positive; students felt less pressure during class time to absorb a large amount of new material and said the activities in class reinforced what they were learning outside of class.

**Fellowship Impacts on Teaching at Duke**

We also find evidence that the CIT fellowships have an impact on teaching at Duke beyond the individual faculty members who participate in them. This happens largely because fellowship participants become advocates for teaching excellence in their departments and among their colleagues. The chart below shows the fellowship impacts with red indicating direct impacts on fellowship participants and blue indicating indirect impacts on other people at Duke.

**Chart 2: Fellowship Impacts on Teaching**

- **Do something to promote teaching excellence in your department**: 41%
- **Help a colleague change how they teach**: 58%
- **Mentor another faculty member at Duke**: 67%
- **Talk about teaching with a colleague**: 92%
- **Seek out teaching development experiences**: 58%
- **Come back to CIT for something**: 58%
- **Try an experiment in teaching**: 83%
- **Change how I teach**: 83%

_Since the chart is not fully visible in the text, the percentage values are estimated based on the visible portions._

**Blue - Impacts on teaching at Duke**  
**Red - Impacts on fellowship participants**

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Conversations with Colleagues

As shown above, almost all fellowship participants indicated that they talked with other faculty members about teaching. When we asked for examples of this, one person told us, “[I] have discussed my use of TBL in [department] courses with several other faculty, and had one assist in my classroom so that he could experience the format.”

Changing how Colleagues Teach

We also found examples of fellowship participants helping colleagues change how they teach. In one example, a fellowship participant recounted having a conversation with a colleague about learning objectives. The colleague said he was writing learning objectives for his course and he had about 15. The fellowship participant was able to help him narrow his objectives down to 5 measurable ones. Another fellowship participant gave the following example of impacting others at Duke:

I have been able to share a couple of techniques I learned in the CIT fellowship with 4 other colleagues! These techniques included specific activities, discussions about the value of different assessments for different types of learners, specifying goals of activities linked to course objectives, and the utility and practicality of group learning. One colleague, in particular, had expressed interest in incorporating more formative assessments and opportunities for application of knowledge. I believe that my discussions with her helped her develop these aspects of her course this semester, and she has seen positive responses from the students.

Mentoring Colleagues

A third way we found fellowships impacted teaching at Duke is when fellowship participants mentored other faculty members. This happened most often when people co-taught courses. Several participants told us that they co-taught a course with someone who was unfamiliar with active learning and, after the experience, the person they taught with changed how they taught in other courses as well. One participant described, “I was paired with a new faculty member to co-teach a course last year, and we used the unit plans I developed as a result of the fellowship as well as a flipped classroom format. The other instructor has continued the active learning format this year.”

Promoting Teaching Excellence

Finally, just under half of the people who responded to our survey indicated they had done something to promote teaching excellence in their department. For example, one person said he talked with his department chair about holding an active learning workshop for the department. Another person said that she gave a presentation about active learning in a department meeting.
Challenges and Opportunities
One ever-present challenge for any research university is how to support teaching excellence when many faculty members feel encouraged to focus heavily on research and scholarship. While there are valid reasons for this culture to exist – regular rank faculty at research institutions are expected to become recognized leaders in their fields through research – we propose that there are opportunities at Duke to improve how the university simultaneously supports excellence in research and teaching. We find great potential in the feedback from fellowship participants indicating a widespread and genuine commitment to teaching excellence among faculty members at Duke.

Rewarding Teaching
One way that Duke could support innovative teaching would be to increase recognition for those faculty members who have teaching-focused positions. There is evidence that there is support for such a proposal. Within Trinity College of Arts and Sciences, 23% of faculty members are non-tenure track, e.g., Professors of the Practice, yet over the past 10 years, 35% of Arts and Sciences teaching awards have been awarded to non-tenure track faculty. Additional awards or recognition opportunities could be created to highlight the work of teaching-focused faculty members.

There is also an opportunity to better leverage current students to recognize excellence in teaching. Currently faculty members whose course evaluations are in the top 5% receive a letter of recognition from the dean. However, course evaluations are only one source of information from students about how well people are teaching. Creating a process by which current students can nominate faculty members for teaching recognition would expand the ways that the people being taught can identify outstanding teachers.

Department Outreach
Based on our interviews and focus groups, it is clear that there is significant variation in how much emphasis departments place on teaching excellence. The fellowship participants largely felt that their departments believe teaching is valuable, but they heard from colleagues who had different experiences. The university leadership could incentivize all departments to value teaching through initiatives such as department-specific teaching awards or funding for department-based teaching workshops.

Centralized Resources
Many of the people who participated in the fellowships told us that they would not have known such an opportunity existed if they were not already connected with CIT through some other project. We also heard from some people that they only learned about the fellowships and other CIT resources by talking to a colleague who had previously participated.
While this may highlight the need for CIT to more widely promote future fellowships, it may also be indicative of the lack of centralized resources related to teaching practice. The creation of a centralized way for faculty members to find teaching-related resources could take many forms: a teaching center on campus, a teaching fair for faculty, a new faculty orientation event, or some other way to connect faculty members with all the teaching-related resources on campus.
Appendix A: List of Participants from Fellowships 2012 - 2016

**Active Learning Fellowship:**
- Elizabeth Bucholz, Lecturer, Biomedical Engineering
- Tanya Duncan, Postdoctoral Associate, Biology
- Jeffery Forbes, Associate Professor of the Practice, Computer Science
- Eric Green, Assistant Professor of the Practice, Duke Global Health Institute
- Mahmoud Kaddoura, Assistant Professor, School of Nursing
- Minna Ng, Visiting Assistant Professor, Duke Institute for Brain Sciences
- Chelsea Salinas, Instructor, Biomedical Engineering
- Julie Tuttle, Lecturing Fellow, Thompson Writing Program
- Gennifer Weisenfeld, Professor, Art, Art History and Visual Studies

**Flipped Class Fellowship:**
- Dorian Canelas, Assistant Professor of the Practice, Chemistry
- Charlotte Clark, Lecturer, Nicholas School of the Environment
- Amanda Starling Gould, Graduate Student, Literature
- Henry Greenside, Professor, Physics
- Stephen Kelly, Visiting Professor of the Practice, Public Policy
- Ken Rogerson, Associate Professor of the Practice, Public Policy
- Kearsley (Karrie) Stewart, Associate Professor of the Practice, Duke Global Health Institute
- Liz Turner, Assistant Professor, Department of Biostatistics and Bioinformatics and Duke Global Health Institute
- Sandra Valnes Quammen, Lecturer, Romance Studies
- JoAnne Van Tuyl, Professor, Slavic & Eurasian Studies
- Steve Wallace, Instructor, Biomedical Engineering

**Team-Based Learning Fellowship:**
- Nicholas Carnes, Assistant Professor, Sanford School of Public Policy
- Mine Cetinkaya-Rundel, Assistant Professor of the Practice, Statistical Science
- Dennis Clements, Professor of Pediatrics, Community and Family Medicine, and Global Health
- Daniel Gauthier, Professor of Physics (No longer at Duke)
- Michelle Hartman, Assistant Professor, Nursing
- Alison Hill, Lecturer, Biology
- Katie Kretovich, Graduate Student, Cell and Molecular Biology (No longer at Duke)
- Cory Krupp, Associate Professor of the Practice, Public Policy
- Laura Lieber, Associate Professor, Department of Religion
- Richard Lucic, Associate Professor of the Practice, Computer Science
- Yuvon Mobley, Graduate Student, Department of Molecular Genetics and Microbiology (No longer at Duke)
- Dick MacPhail, Associate Professor, Chemistry
Alyssa Perz-Edwards, Assistant Research Professor, Biology
Chantal Reid, Assistant Professor of the Practice, Biology and Environmental Sciences & Policy
Rebecca Vidra, Lecturer, Environmental Sciences & Policy