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Peer-Reviewed Exploration in Teaching: A Program for Stimulating and Recognizing Innovations in Teaching

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Abstract
In an academic world driven by student ratings and publication counts, faculty members are discouraged from exploring new pedagogical ideas because exploration takes time and often goes unrecognized. The contrast with research is striking: everyone is expected to explore and innovate in research, whereas very few make exploration in teaching their norm. This paper presents a case study illustrating a program, the Peer-Reviewed Exploration in Teaching (PRET) program, designed to encourage and recognize faculty when they implement teaching innovations. The program provides feedback during all stages of a teaching innovation, including outside-classroom activities, and incorporates a rigorous peer review process so that successive such PRETs can accumulate into a record for tenure and promotion. The paper describes the program's rationale, initial implementation, and lessons learned. Perhaps one of the most interesting lessons is that faculty explorations often go beyond a standard inventory of active learning techniques when they are encouraged and supported to explore.

Keywords
Teaching innovations, recognizing teaching excellence
Peer-Reviewed Exploration in Teaching: A Program for Stimulating and Recognizing Innovations in Teaching

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In an academic world driven by student ratings and publication counts, faculty members are discouraged from exploring new pedagogical ideas because exploration takes time and often goes unrecognized. The contrast with research is striking: everyone is expected to explore and innovate in research, whereas very few make exploration in teaching their norm. This paper presents a case study illustrating a program, the Peer-Reviewed Exploration in Teaching (PRET) program, designed to encourage and recognize faculty when they implement teaching innovations. The program provides feedback during all stages of a teaching innovation, including outside-classroom activities, and incorporates a rigorous peer review process so that successive such PRETs can accumulate into a record for tenure and promotion. The paper describes the program’s rationale, initial implementation, and lessons learned. Perhaps one of the most interesting lessons is that faculty explorations often go beyond a standard inventory of active learning techniques when they are encouraged and supported to explore.

INTRODUCTION

This paper presents the Peer-Reviewed Exploration in Teaching (PRET) Program, a model for a university-wide program appropriate for all disciplines that is designed to: 1) stimulate teaching innovations, 2) support faculty during the innovation process, 3) recognize faculty efforts, and 4) create an environment for teaching explorations that last beyond the program completion.

Why Innovate?

Let us first address a more basic question: why bother to innovate in teaching? Isn’t it be enough to let a few innovate, prove that their techniques work, and offer teaching workshops to the rest of us? We argue that there are at least a few reasons why innovation, or at least curiosity-driven exploration, should be more common. The first relates to the complexity of learning and fostering a collective effort in academia that is equal to the task: if more faculty are engaged in systematically exploring what works and what doesn’t, we are likely to improve student learning outcomes. Consider, for example, that there are 9,400 physics faculty (White, Ivie, Ephraim, 2012) in the nation, most of whom are engaged in some scholarly activity in physics to understand the complexities of the physical world. Why aren’t as many faculty focused on addressing the complexities of learning? If student learning is as complex as is commonly believed, it invites the participation of more faculty in exploring and understanding how to make it work well. A second reason arises from the need to adapt techniques locally: each one of us has students from different backgrounds, who are in turn taking local flavors of courses. Thus, for example, one does not effectively use clickers in exactly the same way for a mid-morning class of residential undergraduates in chemistry, as for an evening class on health policy for working professionals. Such local adaptation takes time to refine, and constitutes a protracted exploration over several course offerings that needs nurturing and administrative support. Others have written about this need as well. For instance, Wood (2009) explains (using biology as an example) why innovation in biology teaching is needed: 1) for the U.S. to remain competitive in the global economy; 2) to exploit new discoveries in educational psychology, cognitive science, and neurobiology that have the potential to improve student learning; 3) to build on and adapt research from Discipline-Based Education Research (DBER) groups; and 4) to produce better biology majors. Finally, a culture of constant experimentation strengthens our collective agility in academia to respond to a rapidly changing landscape in higher education.

Relationship to Tenure and Promotion

What is also clear, in addition to the need to stimulate pedagogical exploration, is that standard approaches to evaluating teaching for tenure and promotion are limited in what they evaluate, often relying just on student ratings or isolated classroom visits. Student evaluations of teaching can provide valuable feedback about the instructor’s teaching effectiveness (Svinicki & McKeachie, 2010), but researchers have mixed findings about them (Boring, Ottoboni, Stark 2016; MacNell, Driscoll, Hunt, 2015). This problem has been recently recognized as challenging (Stark & Freishtat, 2014) despite the increasing emphasis on helping faculty develop instructional competence since the 1980s (Eble & McKeachie 1985; Seldin, 1990). Elton (1998) aimed to define the concept of “teaching excellence” and discovered that it is a complex concept and requires defining excellence at individual, departmental, and institutional levels. At the same time, a full-fledged statistically rigorous learning outcome study may not be practical for everyone, since not everyone has multiple sections for a careful control-and-experiment procedure, nor are there statistically reliable tests of learning in every subtopic of every field. Furthermore, some types of pedagogical experimentation will involve only a part of course, or another goal such as student engagement. Also, it is important to encourage adaptation of technique rather than have the pressure to solely create something new out of whole cloth; for example, a biology professor in our program experimented with case studies in her introductory biology class, a relatively new idea in biology but quite well-established in business schools.

A comparison between teaching and research raises yet another issue. In research, faculty members are accustomed to publishing incremental work that accumulates over time into a strong record of scholarly work. In alignment with this tradition, the
...In the author’s words, they are: “Do I know What SoTL is? Is it something...discipline? What kind of questions will I be asking myself?...what will I be attending to?”

Relationship with SoTL

While some SoTL activities may require faculty to develop new forms of evidence, SoTL research is not necessarily innovative. Faculty who engage in SoTL must create and implement instructional interventions and reflect on the results. These interventions can be assessed using a range of methods, such as: (1) create an action research plan; (2) assess the effectiveness of the interventions; (3) share the results with other faculty and the wider academic community. The purpose of SoTL is to promote the improvement of teaching and learning, and to provide opportunities for faculty to engage in meaningful and continuous professional development.

Peer-Reviewed Exploration in Teaching (PRET) Program

Our Peer-Reviewed Exploration in Teaching (PRET) program is a mechanism that, roughly equivalent in effort to producing a research article, allows faculty to demonstrate a peer-reviewed contribution to teaching with real impact in their classroom. In designing the PRET program, we sought to respect several constraints. Ideally, we wanted a program that:

- lasts no longer than a semester but includes innovations that can be continued;
- encourages collaboration and works for a cohort of faculty from across the disciplines;
- features multiple forms of rigorous intramural peer-review;
- is grounded in the literature on pedagogy and the scholarship of teaching and learning; and,
- of course, stimulates exploration beyond the usual established techniques in active learning.

Our program was initiated in Spring 2012 and is informed by innovative trends in education (Beichner et al., 2007; DeHaan, 2005; Woodhouse, 2010), while others caution the community of scholars about advocating for recognizing DBER as a field of study (Woodhouse, 2010). In designing the PRET program, we sought to respect several constraints. Ideally, we wanted a program that:

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The structure asks faculty to explain their idea in detail, the motivation, related literature, why the idea is connected to the learning objectives, the thinking level of their objectives according to a taxonomy of educational objectives of their choice, and the specifics of the learning activities. Anonymous reviewers of the proposal often provide constructive feedback, resulting in much improved proposals. We also run a focus group with the students to understand how the exploration impacted them.

Having described the program, we now ask does the PRET program of faculty with teaching and learning experience have a positive effect on student learning? We argue that the combination of the proposal, the reviewers’ report and the reflection roughly parallel a research article (an experiment, the results, and the interpretation). Students in this course, who normally expect a descriptive and memory-intensive course, were in addition given case studies that asked them to apply principles to solve a biological problem that the teacher had to read further on their own, and articulate how they applied the principles from the course towards addressing the questions in the case study.

To avoid merely glibly noisy inputs, the PRET program requires applicants to follow a proposal template designed to force PRET participants to connect learning outcomes with their proposed exploration and to ground this in the literature. The PRET proposal template asks faculty to explain their idea in detail, the motivation, related literature, why the idea is connected to the learning objectives, the thinking level of their objectives according to a taxonomy of educational objectives of their choice, and the specifics of the learning activities. Anonymous reviewers of the proposal often provide constructive feedback, resulting in much improved proposals. We also run a focus group with the students to understand how the exploration impacted them.

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Lessons from Study

Although our program had recently been instituted, we have sought to explore its impact on faculty. Our case study is based on data from two cohorts with a total of N=14 faculty. PRET is offered every Spring semester and it is advertised through all the GW faculty listservs. The instructors who participated in the PRET program self-selected themselves and they ranged from beginners to experienced instructors. The majority of them were teaching-focused faculty. There were no changes in the PRET protocol from one cohort to the other. For the two cohorts we mentioned, we examined two types of data: (1) the products from the PRET program including proposals, comments on proposals, reviews from the peers that visited the classroom, reflections and final reviews; and (2) an anonymous survey administered to participants after the completion of the program. The written materials, such as proposals and reviews, were examined by the two authors independently and initially coded according to Ambirgham's scheme. Then, we reviewed the more complex interventions to analyze their Bloom level (Anderson et al., 2001). The raw survey data was similarly analyzed.

Given our relatively small sample size, we questioned if a survey was an appropriate tool for collecting feedback, but after analyzing alternative methods like focus groups with faculty or interviews, we decided that the anonymous survey would allow faculty to express their thoughts more freely. The survey was administered online and faculty were invited to participate. No rewards of any kind were offered to the participating faculty.

The lessons we learned can be broadly described through the following questions:

- Does PRET time consuming? Faculty spend between 30-50 hours over a semester to go through all the PRET steps.
- Does the system or an active role in advertising the PRET, question, we examined the proposed interventions, classifying the learning activities using the active learning inventory described in (Van Ambirgh, Devin, Kinser, Quillens, 2007). This tool showed us at least two results: (1) instructors choose to implement innovations that are aligned to the student-centered learning techniques and (2) instructors go beyond existing popular innovations. We have been able to map all the learning activities implemented onto the items listed by Van Ambirgh's instrument except some found in 8 (out of N=14) courses which were outside the list. This suggests that many faculty were indeed spurred into trying something altogether new. The interventions proposed by most faculty were complex (combinations of elements in Ambirgh's list, or combinations of entirely new activities), with multiple activities spread across various levels of thinking complexity. Figure 1 below illustrates the distribution, which shows that most activities were of medium complexity or higher.

- Does the Analysis recognize PRET? Besides the reasons mentioned at the previous point, it is worth mentioning that the administration provides feedback and support to PRET-related events and in sponsoring PRET faculty to disseminate their PRET experiences at GW's Teaching Day, an annual event celebrating teaching. Additionally, PRET has its own website administered and supported by the administration.

- Once the program is complete, does the sustained change in the classroom endure to justify the return on the resources invested in the faculty continuing to use the PRET innovation in the classes after they complete the PRET-some of them even start to present their findings at national conferences, besides their presentation at the GW Teaching Day. Additionally, the fact that faculty tend to return to the resources invested in PRET.

- How are faculty concerns about student evaluations addressed? It is well-known that faculty perceive that classroom innovation can sometimes bring about weaker student ratings (Michael, 2007). This is one reason why the program explicitly explicits the standard end-of-semester ratings in favor of peer reviews and student focus groups run by faculty.

- How could such a program be adopted at other universities? What is involved and what are the costs? We propose that the university's teaching center together with strong support from the administration launch a pilot cohort as we did in the program. Early-adopter faculty would need to be recruited for the first cohort, after which they would serve as evangelists. Clearly strong support from the administration is necessary, both in messaging and the willingness to recognize those who complete the program. The only real cost is the time similarly needed by the program's administrator; possibly a faculty member granted some release time.

CONCLUSION

In this paper, we made a case for spreading the wealth of innovation in teaching. Innovating and exploration is fun and stimulating and satisfying, but is challenging to achieve in a teaching climate dominated by student ratings and weak recognition by colleagues and administrators. The PRET program was designed to offset these barriers to innovation by providing a structured process to encourage and support faculty in innovation, while providing rigorous peer review and administrative recognition. In addition, the program allows faculty to accumulate a number of these, each the rough analogue of a research article, into a record of sustained contributions to teaching. The program is ongoing at George Washington University, with the goal of recruiting more faculty, chairs and administrators in support.

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REFERENCES


Conception, D., Holtzman, M. & Ranieri P. (2009). Sustaining student engagement: A model for faculty learning and support faculty in innovation, while providing rigorous peer review and administrative recognition. In addition, the program allows faculty to accumulate a number of these, each the rough analogue of a research article, into a record of sustained contributions to teaching. The program is ongoing at George Washington University, with the goal of recruiting more faculty, chairs and administrators in support.


