Teaching Ourselves: A Model to Improve, Assess and Spread the Word

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Abstract

This paper presents a model for small, interdisciplinary groups of faculty to work together to improve their teaching while engaging in research that provides evidence of improved student learning. In doing so, we have developed a four-step process of faculty-driven scholarship of teaching and learning: Genesis, Organization, Implementation and Dissemination. We illustrate this model by describing our use of Fink's (2003) concepts of course design to reshape our courses and assess the effectiveness of these changes through examination of student learning. We describe how others may follow this approach with a variety of applications.

Keywords

SoTL model, Faculty-driven scholarship of teaching and learning, Cross-disciplinary scholarship of teaching and learning

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Abstract

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A Model for Faculty-driven, Cross-Disciplinary Scholarship
of Teaching and Learning (SOTL)

Upon arriving at a university or college setting, faculty are expected to excel immediately in their classrooms with little to no formal preparation. While in graduate school, most Ph.D.'s spent their time preparing for their future role as researchers and theoretical experts in their field instead of preparing to be teachers (Buskist, Tears, Davis, & Rodrigue, 2002; Vangelisti, Daly, & Friedrich, 1999). Although teaching is seen as important, many faculty are judged on their ability to publish within their field and are more often rewarded for their scholarship than their

teaching. In addition, without formal instruction on how to excel as a teacher, many tend to have bad experiences in the classroom that negatively affect their development as educators. The more negative classroom experiences they have, the less they are interested in developing their teaching abilities (Boice, 1998). For these reasons and more, formal programs are needed to provide professors with the skills to excel in the classroom.

Professionally staffed faculty development centers can have a great impact on teaching and learning in institutions of higher education (Caldwell & Sorcinelli, 1997). However colleges do not always have the funding or support for such a center. At Central Connecticut State University, a small group of faculty began an initiative 13 years ago that has culminated in our Center for Teaching Excellence and Leadership Development (CTELD). This center functions entirely at the initiative of faculty members, with no professional faculty development staff. (The CTELD website can be found at http://www.ccsu.edu/Forum/resources, journals, publications on SoTL.htm)

How do we, as faculty, teach ourselves how to improve our instruction? We learned to follow the model of the scholarship of teaching and learning, which has been described as " teaching that involves inquiry into learning and that is being made public in a way that can be critiqued, reviewed, built upon, and improved" (Huber, 2001, p. 22). This paper presents a model for small, interdisciplinary groups of faculty to work together to improve their teaching while engaging in research that provides evidence of improved student learning. In doing so, we have developed a four-step process of faculty-driven scholarship of teaching and learning: Genesis, Organization, Implementation and Dissemination (Figure 1). We will use this model to provide an overview of our experience with this collaborative, faculty-driven SOTL project.
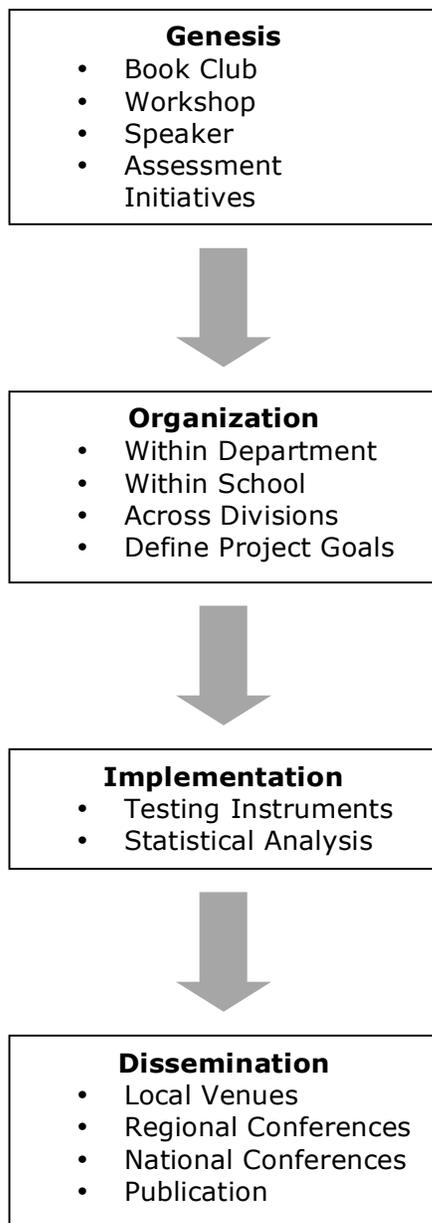
Genesis
- Book Club
- Workshop
- Speaker
- Assessment Initiatives

Organization
- Within Department
- Within School
- Across Divisions
- Define Project Goals

Implementation
- Testing Instruments
- Statistical Analysis

Dissemination
- Local Venues
- Regional Conferences
- National Conferences
- Publication

Figure 1. Our model of small group SOTL project

Genesis

One of the programs provided through CTELD is a book club in which we read and discuss one book on college teaching each semester. In 2004, six faculty members from four different departments at Central Connecticut State University read L. Dee Fink's (2003) book *Creating Significant Learning Experiences*. (Fink's website on this topic can be found at http://www.ou.edu/idp/significant/index.htm). The professors all had two things in common. We were interested in improving our teaching and we

wanted a theoretical model to help us structure the changes that we were going to make in our classrooms. Fink's approach provided us with the structure we needed to redesign our courses. We adopted two basic aspects of this approach: backward course design (Wiggins & McTighe, 1998) and Fink's taxonomy of learning goals (See Fink's website describing his taxonomy at http://www.ou.edu/pii/significant/WHAT%20IS.pdf). Fink proposes that course design begins with the "big picture" of how teachers want students to change as a result of what they learn in their course. He outlines six goals for student learning: foundational knowledge, application, integration, caring, the human dimension and learning how to learn. After developing goals, course designers then develop assessments of those goals. Finally, the course activities are planned.

We took this project one step further. We wanted to plan a systematic way of showing that our use of Fink's approach was successful. Therefore we planned assessments of student learning that would differ from standard final exams. Our results, based on Fink's six goals, would be combined in a meta-analysis to demonstrate the efficacy of this approach to others as well as ourselves. In this way our scholarship of teaching and learning project was born.

The book club was the genesis of our project, but it could just as easily have been an institutionally sponsored teaching workshop, or an inspiring speech by a guest educator. Rather than praise the book as interesting and then dismiss it, we began our process of implementing what we had learned about course design, with a plan to test our efforts in terms of student learning.

Organization

Inspired by Fink's model of course design, we met throughout the summer to plan our redesigned courses and assessments. Overall, we found Fink's model of course design to be extremely malleable. The model is results-driven, focusing on the changes we want to see in our students by the end of the course. Therefore, in our bi-weekly meetings we continuously reminded each other to focus on the nature of these changes.   Often, as teachers, we tend to focus on the activities of teaching rather than what we want students to learn. Using this backwards design process, we developed specific course goals for each of our classes before we planned specific activities.

Next, we turned to planning the assessments of student learning. In our meetings we became sounding boards for one another as we shared our ideas and frustrations with measuring our students' learning in ways that extended well beyond factual knowledge. Often, hearing how a colleague approached this difficult task helped other faculty members to address this area in their own courses.

With our assessments conceptualized, the time had finally come to plan how we would actually teach our respective courses. Our meetings evolved into collaborative forums for brainstorming, sharing and networking as we explored various teaching activities and methodologies. It was during these meetings that our new courses came to life.

Example

The professor of anatomy and physiology (Cheryl Watson) was not convinced that students who completed the course were able to apply their knowledge. The course goal for this faculty member was getting students to see physiology in their everyday

lives and understand what biological mechanisms were occurring. Once this goal was recognized, the assessment was planned. In this case, the assessment would require students to write an essay describing all the structures and cumulative mechanisms that allow us to lift a glass. Finally, the class activities were linked to this final outcome. Through the use of mini-case studies, students were asked to learn the bones and articulations of the hand and arm used in picking up a glass. As the semester progressed, the assignments became additive, as they described which muscles were used in this same action, how those muscles were enervated and how the action was centrally initiated. Picking up a cup would never be the same for these students, who now saw physiology at every meal. A course goal was translated into appropriate activities. For more information on the use of case studies in science education, see the following website: http://ublib.buffalo.edu/libraries/projects/cases/case.html.

In reflecting on this experience, two things were critical to the organization of our project. First was the broad application of teaching theory across disciplines. This process was equally useful to those of us teaching psychology or education as it was to those teaching general biology and anatomy & physiology. Second, our ongoing commitment and focus on assessment of student learning throughout this process provided us with valuable data to evaluate the impact of our project both individually and collectively.

Implementation

Given that we had assembled faculty from four different disciplines, one might think that the most difficult task would be finding a standard means of comparing the effects that our course design changes had on student learning. This task was, however, rather straightforward and the approach we used could be easily applied to any discipline or collection of disciplines.

For each course in our study, the instructor created a test that was given at the beginning and end of the semester. We used a paired t test within each class to determine if there was a significant change in student scores from the beginning to the end of the semester. Subsequently, we calculated the average beginning and end score for each course (relative to the available points) and used those averages to conduct a t test as a meta-analysis to determine if the approach we used to course design was effective across disciplines.

The difficult part was creating the pre- and post-tests based on Fink's taxonomy. Some questions were easier to create than others. We all had experience writing questions to assess student knowledge of facts, applications of facts and integration of facts. However, other assessments of student learning proved more difficult. Could students take knowledge from the classroom and readily use it in their daily lives? Did the knowledge acquired during the semester change the student's point of view, or affect how they saw themselves within the world?

An example of the difficulty in designing questions comes from a biology course (Jack Tessier). We asked whether students planned to predict what color eyes their children would have. This question was designed to find out whether the students

had internalized their understanding of genetics to the point that they cared about both the topic and how they could use it in their own lives. We expected that a high score on a Likert scale would indicate a high degree of caring. What happened was a polarization in the answers. Most students either answered that they definitely would or definitely would not make this prediction. Therefore, while most students clearly cared about the topic, nearly half of those who did care were of the decided opinion that they did not want to make that prediction, but would rather wait and be surprised.

A second example of the difficulty of designing such tests relates to student motivation. When we asked students to voluntarily complete the test at the beginning of semester, they were energetic, upbeat, and excited. When it came time to complete the test at the end of semester, many students were harried, tired, worried about approaching final exams, and ready to get on to the next task. A more accurate representation of student learning may be achieved by attaching a class grade to at least the post-semester assessment

Collectively, our course redesigns led to statistically significant improvements in student learning within Fink's taxonomy of significant learning in all of our courses (Levine, et al. in press). While our tests did a sufficient job of assessing student learning, unintended outcomes such as those previously described may have led to an underestimation of the improvements. The experience of creating these tests has solidified in us the importance of careful test construction and a willingness to modify an approach to data analysis and presentation pending the results in order to fully explain the story that the data reveal.

Dissemination

We have found many outlets to disseminate the outcomes of our work. We presented our project and approach at two on-campus venues and one regional teaching conference. We were invited to take part in the orientation of new teachers at our university and to give several workshops for all faculty. Our work was well received in all settings. Further, we are in the process of publishing an account of our work, its results, and its meaning in a peer-reviewed outlet (Levine et al., in press). Having such positive outcomes encourages us, and should encourage others, to see the scholarship of teaching and learning not just as a way to improve teaching (although this is a critical goal), but also as an additional way to demonstrate scholarship beyond one's own disciplinary field. Certainly, gathering a group of interested faculty, conducting teaching and learning research, and presenting the results can be a rewarding and productive experience.

Timeline

How long does this process take? Certainly each group will progress at its own pace, but our educational research experience went on for approximately two and a half

years (Figure 2). We began in spring 2004, when we read the book that inspired us to begin the experiment. This was our genesis. In May 2004, we applied for a university faculty development grant to pay the research assistants we needed for data analysis. We met during the summer of 2004 and through the fall semester to plan our new teaching strategies and to develop assessment tools. This was our organizational phase. In the spring and fall of 2005, we taught the revised courses, and collected and analyzed the data. This was the implementation phase. In November 2004, we presented our project at the New England Faculty Development Conference workshop. Early in the fall of 2005, we presented at faculty workshops within our University. Finally, we prepared the manuscript during the summer and fall 2006. This was our dissemination phase.

Figure 2: Our Timeline

Spring, 2004	Summer, 2004	Fall, 2004	Spring, 2005	Summer/Fall, 2005	Spring/Summer 2006
Genesis	Organization		Implementation		Dissemination
Book club reads Fink (2003); six members design study	Group meets to develop pre- and post-test assessments	Group plans course changes; project presented at the New England Faculty Development Consortium Conference	Four members carry out new course designs; presentation of project design and preliminary results at the college teaching excellence symposium	Two other members carry out new course designs; scoring of assessments; presentation at the workshop for new faculty on campus and at the teaching excellence faculty seminar	Analysis of results; manuscript preparation, submission and revision

Conclusion

The model we present (Figure 1) can be applied to any institution of higher education. We presented the steps that we took, but there are alternate ways in which the process of improving teaching, assessing the outcome in student learning, and spreading the word about teaching innovations can occur. Although our genesis came in the form of a book club, others might come from a lecture, a workshop, or an informal conversation. One stimulus might come from an online group for discussion of integrated course design established by Fink at the following address: http://groups.yahoo.com/group/integratedcoursedesign/. The next step is organization, which can happen with a small group of committed faculty within departments or disciplines, or across disciplines. Implementation must then involve planning the changes in teaching and developing appropriate assessments, including applications for any necessary funding to carry out the research. Group discussion works well to stimulate creativity in solving the pedagogical problems posed by individual courses. Finally, the group can become a resource for the campus and/or a wider community through presentations to disseminate the results and share in discussion to stimulate others to try the process themselves. A peer-reviewed

publication provided us with a wider outlet for "spreading the word". Improvement of teaching and learning is a never-ending process, but the approach we have outlined can provide structure to this endeavor and lead to outcomes that will promote the value of the scholarship of teaching and learning within the academic community.

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