



**Training the Next Generation of Instructors:
The Effects of a Pedagogy Seminar on Graduate Students' Use
of a Learner-Centered Paradigm**

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While it is generally acknowledged that student learning is better achieved through a dynamic process that engages student motivation and active learning (Bonwell & Eison, 1991; Huba and Freed, 2000; Shrunk, Pintrich & Meece, 2007; Svinicki 2004; Tagg 2003), colleges and universities are still far from adequately providing such learner-centered learning environments. Before this can be achieved, those in charge of undergraduate instruction must be trained in this different approach to teaching and learning (Gibbs & Coffey, 2004; Sadler, 2011; Stes, Coertjens, & Petegem, 2010), especially those unwittingly wedded to the traditional instructor-centered model of content transmission that promotes passive learning.

A crucial component to addressing this issue is the development of graduate students as effective teachers attuned to this different pedagogical paradigm. Graduate students perform a large portion of undergraduate instruction as lecturers and teaching assistants, and they will continue to do so as they become part of the professoriate (Marincovich, 1998; Park, 2004). However, nearly half of new faculty reported that they did not feel adequately prepared for their roles (Hurtado, Eagan, Pryor, Whang, & Tran, 2012). Although an increasing number of colleges and universities offer more extensive instructional training in learner-centered approaches through seminars and courses that expand on the typical one-day TA orientation (Hardré, 2005; Marincovich, 1998), there is little research examining the effectiveness of these programs. Most studies evaluate changes in only self-efficacy or teaching philosophies (Saroyan, Dagenais, & Zhou,

2009; Young & Bippus 2008). Those studies that move beyond self-efficacy tend to rely on student and teacher perceptions of effective teaching, rather than actual evaluations of learner-centered strategies (Hardré, 2003; Pentecost et al., 2013; Shanon, Twale, & Moore, 1998).

This study addresses these shortcomings by evaluating the effectiveness of a semester-long pedagogical seminar designed for graduate students through pre and post-test data collected along three dimensions. First, we evaluated changes in perceived teaching self-efficacy in terms of both instructor and learner-centered components. We also examined changes in course syllabus design to assess if graduate students intended to incorporate more learner-centered elements into their syllabi after having taken the seminar than before they participated. In addition, we assessed pre-and post responses to a teaching scenario to gauge any changes in the application of learner-centered teaching strategies to a simulated “real-life” context.

Review of Literature

The Shift from Instructor-Centered to Learner-Centered Pedagogy

The impetus for a new discourse concerning a paradigm shift in higher education largely stemmed from Barr & Tagg’s (1995) article in *Change Magazine*, which examined and critiqued what the authors deemed the Instruction Paradigm, or the traditional, lecture-centered mode of instruction common at many postsecondary institutions. Barr & Tagg (1995) emphasized that the long-established instructor-centered modalities focused primarily on the passive, one-way transmission of knowledge from instructor to student in the classroom were incongruent with the body of literature on

pedagogical practice that emphasized active student construction of knowledge and meaning-making in the classroom. Thus, to assume responsibility for helping students “produce” knowledge, a shift from the Instruction Paradigm to a Learning Paradigm is necessary so as to reconcile “the gap between what we say we want of higher education and what its structures provide” (Barr & Tagg, 1995, p. 7).

Empirical Evidence of the Effectiveness of Learner-Centered Pedagogy

The push towards learner-centered assessment practices is supported by empirical research on the advantages of learner-centered approaches to teaching (Huba & Freed, 2000; Webber, 2012; Weimer, 2013). The effectiveness of learner-centered practices has been well documented in primary, secondary, and postsecondary educational settings (Cornelius-White, 2007; Lea & Callaghan, 2008; Weimer, 2013). Higher education research on learner-centered practices includes research on practices such as active learning, deep approaches to learning, problem-based learning, and connections between student and faculty (Svincki, 1999; Svincki, 2004; Weimer, 2013).

Learner-centered pedagogies are associated with several desirable undergraduate student learning outcomes. For example, instructor use of learner-centered practices is positively related to the development of various skills and competencies, including: a) students’ professional competencies (Cabrera, Colbeck, & Terenzini, 2002; Volkwein, Lattuca, Harper & Domingo, 2007); b) content knowledge (Schonwetter, Clifton, & Perry, 2002); and c) critical thinking and problem-solving skills (Carini, Kuh, & Klein, 2006; Colbeck, Campbell, & Bjorklund, 2000; Cruce, Wolniak, Seifert, & Pascarella, 2006; Nelson Laird, Shoup, Kuh, & Scharz, 2008; Seifert, Pascarella, Colangelo, & Assouline, 2007; Tsui, 2002; Umbach & Wawryznski, 2005; Volkwein et al., 2007).

Additionally, such practices are also related to various non-cognitive characteristics, such as students' development of future aspirations (Cruce et al., 2006; Nelson Laird et al., 2008; Umbach & Wawryznski, 2005), and perceptions of being challenged in the classroom (Nelson Laird et al., 2008; Umbach & Wawryznski, 2005). There is also a positive relationship between faculty emphasis on deep approaches to learning (i.e., approaches that emphasize integration, synthesis, and reflection) and students' levels of personal and intellectual development (Nelson Laird et al., 2008). The observed relationships across a variety of esteemed student learning outcomes illustrate the need for professional training programs that support constructivist or learner-centered teaching paradigms.

Barriers to the Adoption of Learner-Centered Approaches

Although a growing body of literature on college student learning supports the concept of learner-centered pedagogy as a best practice, there is evidence that faculty (not to mention graduate students) have not embraced the shift to this paradigm. (Webber, 2012; Yanowitz and Hahs-Vaughn, 2007; Brown, Kirkpatrick, Greer, Matthias, & Swanson, 2009). There are structural and cultural barriers that keep college instructors from shifting to Barr and Tagg's (1995) learner-centered paradigm (Fairweather, 2002; Umbach & Wawryznski, 2005; Braxton & Eimers, 1996; Savin-Baden, McFarland & Savin-Baden, 2008; Levin, 2006). Tenure-track faculty often experience a conflict between teaching and research responsibilities, while many of the growing numbers of non-tenure track faculty who teach more classes do not receive the institutional support needed for implementing learner-centered pedagogy in their teaching (Kezar & Sam, 2010; Kezar, 2013; Fairweather, 2002; Gregory & Jones, 2009; Lea & Callaghan, 2008;

Leslie, 2002; Colbeck, 2002). Lea and Callaghan (2008) found that the perceived existence of a culture that privileges research over teaching is seen to be responsible for constraints on implementing best teaching practices for faculty.

The learner-centered paradigm also requires more time and expertise from instructors (Candela, Dalley & Benzel-Lindley, 2006; Doyle, 2008; Colley, Greer et al., 2010). Even when faculty understand and support the use of learner-centered pedagogical techniques, they may not implement these practices in their own classroom for several reasons. For example, barriers to implementation include their perceptions of their subject/discipline, the size of their classes, their self-confidence regarding implementation, student dissatisfaction with a student-centered approach, and their time constraints (Colley, 2012; Umbach & Wawrzynski, 2005; Gilis, Clement, Laga & Pauwels, 2008; Gregory & Jones, 2009; Webber, 2012).

Ebert-May et al. (2011) posited that deep understanding of learner-centered teaching cannot be taught to college instructors without direct practice and feedback on that practice. This process of feedback and practice parallels how students learn (Bransford, Brown & Cocking, 2000). Without deep understanding of how to implement the learner-centered paradigm, many of the barriers are hard to overcome (Postareff, Lindlom-Ylanne and Nevgi, 2008).

Prior Studies of Graduate Student Professional Development as Teachers

Given the barriers identified above for faculty to adopt learner-centered instructional approaches, it seems logical for higher education institutions committed to learner-centered pedagogies to focus not only on the current generation of instructors, but to concentrate on the *next* generation of college teachers as well. The development of

graduate students as effective teachers is a crucial component to addressing teaching and student learning on college campuses. Not only do graduate students teach a large portion of undergraduate coursework as lecturers and teaching assistants, they will continue to do so as they become part of the professoriate (Marincovich, 1998; Park, 2004).

While the training of graduate teaching assistants (GTAs) has expanded over the past thirty years, there is limited empirical research on the effectiveness of pedagogical seminars and programs, and more specifically, on seminars aimed at introducing participants to a learner-centered paradigm (see reviews by Carroll, 1980 and Abbott et al, 1989). Most of the research assesses the influence of broad training on perceptions or self-efficacy of GTAs (Hardré, 2003; Komarraju, 2008; Pelton, 2013; Prieto & Altmaier, 1994; Saroyan, Dagenais & Zhou, 2008; Young & Bippus, 2008). One study examined the effectiveness of a multi-disciplinary pedagogical course for graduate students aimed specifically at promoting a learning-centered approach (Saroyan, Dagenais & Zhou, 2008). Based on pre/post assessments regarding the participants' conceptions of effective teaching and learning, the study found a significant increase in participants' reports of student- or learner-centered conceptions (e.g., promotion of course learning and lifelong learning) and lower reports on the importance of knowledge transmission and managing instruction, which are typical of instructor-centered approaches.

In studies that move beyond efficacy and perceptions, the general focus is on the increased use of student-centered discussion during instructional time (Buehler & Marcum, 2007; Carroll 1977; Dalgaard 1982; Pentecost et al. 2013; Smith, 1974). For example, one study found that the restructuring of a GTA training program to implement

student-centered recitation sessions in a chemistry course led to GTAs increasing the amount of time spent on student group activities and other student-to-student interaction (Pentecost et al. 2013). In an earlier study on a pedagogical seminar that strategically aimed to train GTAs in the use of one teaching method that emphasized student participation through the use of probing questions, the majority of the GTAs (11 out of 15) increased the time spent on asking questions (Smith, 1974). However, it is not certain that the use of student discussion and group work by GTAs necessarily reflects their understanding of learner-centered pedagogy. Additionally, one study found that while GTAs emphasized in their teaching philosophies the importance of student discussion and active learning, these GTAs reverted to instructor-centered methods in their instruction planning and classroom techniques, spending over 75 percent of instruction time on lecturing (Buehler & Marcum, 2007).

Theoretical Framework

In order to study graduate students' adoption of learner-centered pedagogies, we draw from Barr and Tagg's (1995) Learning Paradigm and Lent, Brown, and Hackett's (1994) Social Cognitive Career Theory (SCCT). Elements of Barr and Tagg's (1995) Learning Paradigm have important implications for understanding how faculty in higher education can foster learner-centered learning environments that are more closely aligned with what is known about the nature of how students learn (Ewell, 1997; Cross, 1998). According to Barr and Tagg, higher education institutions have moved away from an instructor-centered or "Instruction Paradigm" to a student-centered or "Learning Paradigm."

The Learning Paradigm assumes a holistic approach to learning and espouses that learning occurs not through a passive transfer of information, but rather as students actively construct knowledge. The Learning Paradigm *in practice* thus translates to learning environments that are learner-centered, cooperative, and supportive rather than competitive and individualistic. To achieve this aim, faculty must essentially give up some control over dictating what must be learned and instead facilitate student-centered learning experiences that allow students to construct knowledge and meaning. This type of pedagogy de-emphasizes the instructor and the disciplinary content they dispense and instead calls attention to the learner as the central figure in the learning process.

Classroom environments that are informed by the Learning Paradigm help students develop “deep knowledge” (Fear et al, 2003) and promote what Gardner (1991) calls an “education for understanding,” or “a sufficient grasp of concepts, principles, or skills so that one can bring them to bear on new problems and situations, deciding in which ways one's present competencies can suffice and in which ways one may require new skills or knowledge” (p. 18). This continuous learning process has the potential to extend beyond the classroom as students make connections between classes and in their external environments. See Figure 1 for additional description of the Learning Paradigm.

Social Cognitive Career Theory (SCCT), a theory derived from Bandura's (1986) social cognitive and self-efficacy theory, provides another lens for understanding how expectations and beliefs in one's ability to succeed can influence future preparedness, performance, and choices (Lent, Brown, & Hackett, 1994). SCCT posits that an individual's self-efficacy beliefs and outcome expectations, as shaped by different learning experiences, will directly influence the types of interests that an individual will

develop and thus which career or academic path he/she chooses to follow.

Figure 1. Examples of Instructor-Centered and Learner-Centered Assumptions and Practices

Instructor-centered pedagogy assumptions and practices	Learner-centered pedagogy assumptions and practices	Graduate student pedagogy seminar approach	Assessment Design
Required material must be covered in order for knowledge to transfer from instructor to student; learning is teacher-controlled; passive learners receive knowledge	Expected learning and student-success outcomes are made explicit; students co-create, construct and develop knowledge alongside instructor; students have control of learning; students are required to be active learners.	Seminar had an emphasis on learner-centered syllabus design, especially with regard to the reading list, assignments, and planned classroom learning activities	<u>Elements of a syllabus:</u> On pre/post test, asked participants in consecutive order to: 1) write in an open-ended question what typical components of a syllabus they would include when creating one from scratch; 2) check-off components of a syllabus from a list
Classroom and learning experiences are characterized by individual effort and competition on the part of students; courses involve a certain number of hours of lecture; teacher dispenses knowledge to students in the classroom	Holistic learning structure and environment; “whatever learning experience works” (Barr and Tagg, 1995, p. 33); expanding and developing learning technologies in the classroom; learning environment is one of support, collaboration, cooperation.	Seminar included explanations of how to structure learning environments and classroom climates to be learner-centered	<u>Teaching self-efficacy:</u> On pre/post test, asked participants to respond to series of questions regarding confidence with instructor- and learner-centered teaching activities. <u>Teaching scenario:</u> On pre/post test, asked participants to respond to a challenging teaching situation, noting underlying problems as well as reactive and proactive solutions
Lecture is the primary teaching method of instructor; assessment is only summative (e.g. a final exam or term paper graded at the end of the course).	Students will demonstrate knowledge and skills; assessments will be formative <i>and</i> summative; teaching methods should be in service of creating powerful learning experiences	Seminar shared effective learner-centered teaching methods and focused on ways of assessing student learning	<u>Teaching self-efficacy</u> <u>Teaching scenario</u>

According to Lent, Brown, and Hackett (2000), contextual factors or “proximal environmental variables,” act as moderators of the development of choice goals and the execution of choice actions (p. 38). Thus, graduate students in the pedagogy seminar are assumed to increase their self-efficacy with using learner-centered pedagogies, and this increase in self-efficacy will contribute to an increased use of learner-centered approaches when teaching.

It is within the framework of the Learning Paradigm and SCCT that this study seeks to expand the limited research on teaching and learning in higher education particularly as it relates to the creation and facilitation of learner-centered learning environments by addressing the following research question: To what extent did graduate student participation in a pedagogy seminar facilitate a change in teaching orientation from instructor-centered to learner-centered?

Methods

Sample

This study was conducted at a mid-sized public research university in the Mid-Atlantic United States. Graduate students who were planning on teaching during the 2012-13 academic year were recruited to participate in the pedagogy seminar in Fall 2012. Ultimately, 26 students enrolled for the course. Only 25 of the participants provided answers on all demographic and teaching experience questions of the survey.

The majority of participants (84.6 percent) identified as White/Caucasian. One student identified as Hispanic or Latino and three identified as Asian, Asian American or Pacific Islander. There were 17 female and 8 male participants, with 1 student missing

data on gender. Overall, the students represented 21 graduate programs across the disciplines, ranging from French to Astronomy. Six students were from the social sciences, nine from Arts and Humanities, and 10 from science, technology, engineering, and mathematics, or STEM, fields. Only six participants were in the early stages of their graduate programs, while 19 were in their fourth year or higher. The teaching experience of our participants varied, with 5 of 25 students with no experience as a teaching assistant and 20 with some experience. The number of courses taught as a teaching assistant ranged from 1 to 9, with the modal response of 5 courses and mean of 3.6. Ten of the 25 participants had no experience as a primary instructor. The total mean for number of courses taught as a primary instructor was 2.4, ranging from 0 to 8.

The Intervention

The pedagogy seminar took place in Fall 2012, was taught by two instructors who were both senior staff members in the campus teaching development center, and met bi-weekly. Key elements covered in the workshop included theories of learning and motivation, the design of learning goals and objectives, and the concept of backward design, or designing the course with the end goals in mind and working backwards to create the reading list, assignments, learning exercises, etc. Other topics discussed over the course of the semester included: assessing student learning, structuring learning activities, effective teaching methods, and classroom climates and learning environments. For examples of how the elements of the pedagogy seminar dovetailed with learner-centered assumptions, see Figure 1.

Instrumentation

We employed several pre-post test assessments, three of which are included in this study:

1. Teaching self-efficacy: On both a pre- and post-test survey, we asked students to respond to a series of questions regarding their confidence level with various instructor-centered and learner-centered activities. Examples of instructor-centered oriented questions included confidence in: keeping the class on task during class periods, and explaining the course material very well. Examples learner-centered oriented questions included confidence in: integrating different techniques to assess students' learning, and stating the learning objectives of the class to one's students.
2. Elements of a syllabus: On both the pre-test and the post-test, we asked students two sets of questions, in consecutive order. First, we asked respondents to indicate, in an open-ended question, what typical elements of a syllabus they would include on a syllabus they created from scratch. Then, we asked respondents to check all of the components of a syllabus they would include for a new course from a list of 23 options (close-ended responses). Examples of items on the list include: "learning goals and objectives," "course policies," "assigned readings," etc.
3. Teaching scenario: Students were also asked to respond to a teaching scenario involving a new teacher's difficulty with engaging and motivating his students. For both the pre- and post-test (which involved the exact same scenario), students were asked to describe the issue arising in the scenario, identify possible

underlying factors at play, relay how they would attempt to address the situation, and provide advice for future instructors of the course.

Data Collection

Pre-test data for the elements of a syllabus and teaching self-efficacy questions were obtained from an online survey administered during the first week of class in the Fall 2012 semester, and the post-test data was collected via online survey during the last week of class. The pre-test for the teaching scenario was administered in paper-and-pencil format during the first class session, and the post-test for the teaching scenario was administered during the last class.

Data Analysis

With the teaching self-efficacy analysis, we first used principal components analysis with orthogonal rotation to create two factors, “instructor-centered tasks” and “learner-centered tasks,” which both had eigenvalues greater than one and strong internal consistency ($\alpha=.88$ and $\alpha=.93$, respectively). We then compared the pre- and post-test mean scores for the instructor-centered and learner-centered factors using paired sample *t*-tests. For the elements of a syllabus analyses, we compared the percent increase or decrease in responses (i.e., post-test minus pre-test) for both the open-ended and close-ended responses. The pre- and post-test scenarios were evaluated using a rubric ranging from 1=completely lacking a learner-centered approach to 4=completely learner-centered approach. Two independent raters evaluated the participants’ scenarios with the unidentified pre- and post-tests mixed together to reduce unintentional bias about raters’ expectations for pre- and post-competence. All discrepancies in evaluations greater than 1.0 in magnitude were mutually discussed and a consensus reached. Then, pre- and post-

test mean scores for the evaluations were analyzed using paired sample *t*-tests. Finally, bivariate correlations were conducted on participants' overall self-efficacy scores and scenario ratings.

Results

Results from the teacher self-efficacy, syllabus construction exercise, and the teaching scenarios revealed much about participant's movement from an instructor-centered paradigm to learner-centered paradigm. The self-efficacy paired samples *t*-test indicated that after the intervention, participants were significantly more confident in their abilities to succeed in instructional design that emphasizes both instructor and learner-centered paradigms. As indicated in Table 1 and Table 2, the mean score for the learner-centered self-efficacy construct was 1.57 points higher (on a seven point scale) on the post measurement ($t=7.588; p<.001$). Less drastically, but still significant, is the instructor-centered self-efficacy construct that was .58 points higher for the post measurement ($t=3.668; p=.001$).

Table 1
Descriptive Statistics of Teaching Self-Efficacy

<i>Composite scores</i>	<i>Mean</i>	<i>Sd</i>	<i>Min.</i>	<i>Max.</i>	<i>N</i>
pre-instructor-centered self-efficacy	5.46	.90	1	7	24
post-instructor-centered self-efficacy	6.05	.61	1	7	24
pre-learner-centered self-efficacy	4.60	.94	1	7	23
post-learner-centered self-efficacy	6.17	.49	1	7	23

Table 2
Paired Sample T-Test Results for Teaching Self-Efficacy

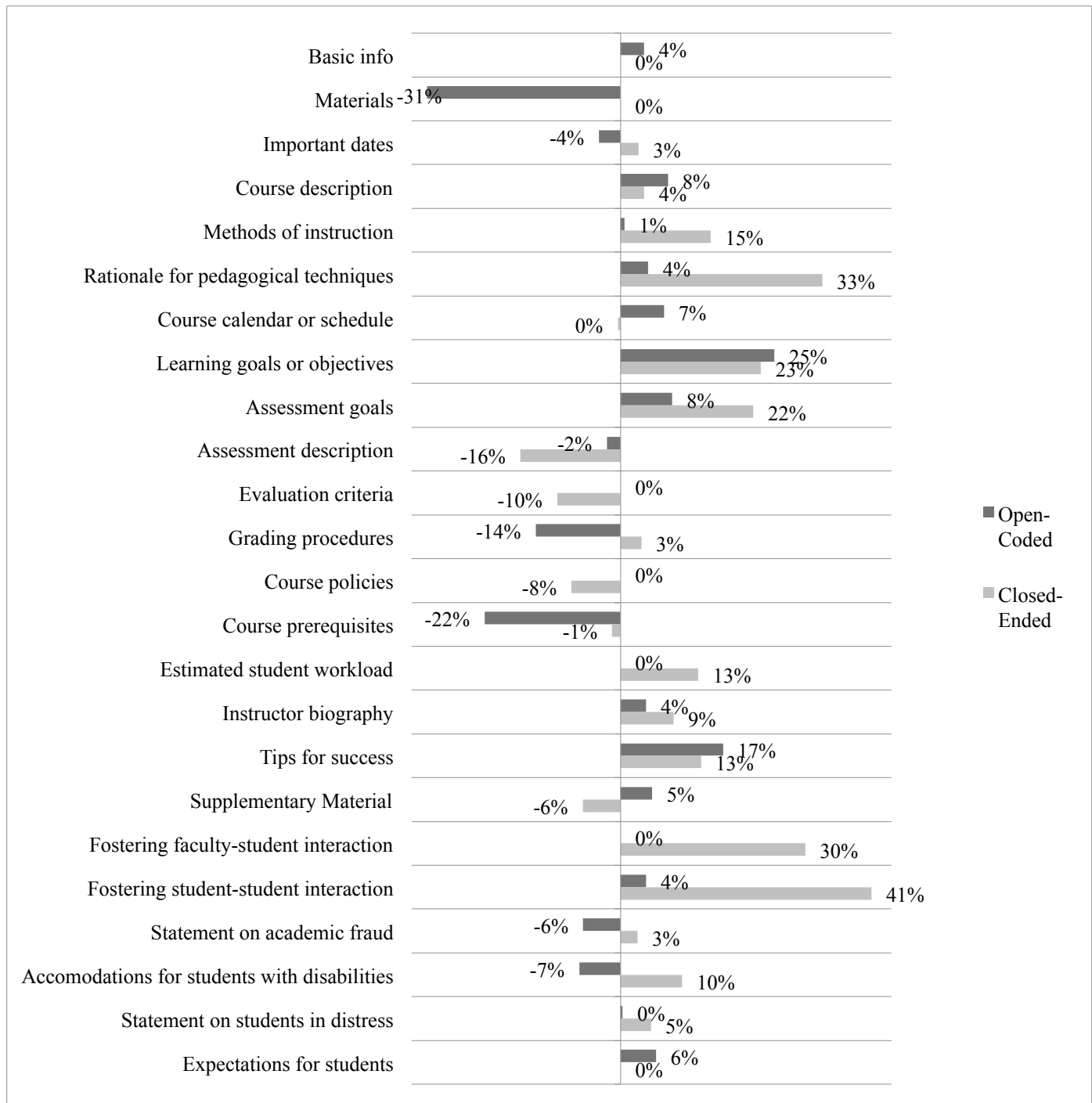
<i>Composite scores</i>	<i>Mean</i>	<i>Sd</i>	<i>std error</i>	<i>t</i>	<i>N</i>	<i>Sig. (2-tailed)</i>
post-scores – pre-scores of instructor-centered self-efficacy	.58	.78	.16	3.67	23	.001
post-scores – pre-scores of learner-centered self-efficacy	1.57	.99	.21	7.59	22	.000

Figure 1 displays the results for the syllabus component assessment. The bars represents the percentage-change (post minus pre) for the number of students who selected a particular syllabus component where the dark grey bar represents the open-ended responses and the light grey bar represents the close-ended responses. Using the syllabus component, “learning goals or objectives,” as an example, when students were asked what they would include on a syllabus in an open-ended question, in the post assessment, 25 percent more students indicated that they would include learning goals or objectives. Similarly, when responding to the close-ended question (i.e., participants were given a list of possible syllabus components) 23 percent more students indicated that they would include learning goals or objectives on the post assessment. Because articulating learning goals and objectives corresponds to a learner-centered paradigm, this might suggest that students made a transition to a learner-centered paradigm as they conceptualized critical syllabi components. There are several other key findings from Figure 1, for example between 22 to 41 percent more students selected the syllabus components “rationale for pedagogical techniques,” “assessment goals,” “fostering faculty-student interaction,” and “fostering student-student interaction,” on the closed-end response, yet fewer students made this transition when responding to the open-ended response (zero to eight percent). Indeed, although participants identified learner-centered

syllabus components from the close-ended list of possible syllabus items, they were less likely to identify learner-centered items when asked in an open forum.

Figure 2

Differences in identification of various components of a syllabus that participants would incorporate into their teaching, pre- and post-test



The results for the teaching scenario paired samples *t*-test were non-significant. To review, a higher mean score represents a scenario evaluation that was more learner-centered. However, there was a slight, but statistically non-significant, increase in participants' ability to identify learner-centered reactive and proactive strategies in the post scenarios. The mean score for the pre-seminar reactive and proactive strategies was 2.34 and 2.59 for the post-seminar ($t=1.401$; $p=.176$). Conversely, there was, effectively, no statistical change in participants' ability to identify the appropriate classroom issue. The mean score for the pre-seminar issue identification was 2.74 and 2.67 (four point scale) for the post-seminar issue identification ($t=-.306$, $p=.762$). The full results are listed on Table 3 and 4.

Table 3
Descriptive Statistics for Teaching Scenarios

<i>Scenario rating</i>	<i>Mean</i>	<i>Sd</i>	<i>Min.</i>	<i>Max.</i>	<i>N</i>
pre-strategies score	2.34	.80	1	4	22
post-strategies score	2.59	.46	1	4	22
pre-issue score	2.74	1.02	1	4	22
post-issue score	2.67	.92	1	4	22

Table 4
Paired Sample T-Test Results for Teaching Scenarios

<i>Composite scores</i>	<i>Mean</i>	<i>Sd</i>	<i>std error</i>	<i>T</i>	<i>N</i>	<i>Sig. (2-tailed)</i>
post-strategy score – pre-strategy score	.25	.84	.18	1.401	21	.176
post-issue score – pre-issue score	-.07	1.04	.22	-.306	21	.762

The bivariate correlations for the relationship between participants' pre-self-efficacy scores (i.e., teacher and learner-centered scores) and pre-scenario scores (i.e., their issue-identification score and the proactive and reactive strategies score) were mostly positive and non-significant, ranging between -.102 to -.224. However, the

relationship between the post-self-efficacy and post-scenario scores were all negative, and mostly non-significant, ranging between $-.278$ and $-.438$. The graph of these relationships reveals that as participants' teacher and learner-centered efficacy increases, their scenario scores decrease. The only significant correlation was between participants' teacher-centered self-efficacy and their ability to identify the scenario issue, where, as participants' teacher-centered self-efficacy increases, their ability to identify the appropriate issue decreases. However, it is important to note that there was no change in participants' pre- and post-test scores regarding their ability to identify the problem or issue in the scenario.

To better understand the nature of student responses to the scenario, we offer a few example responses. In the following excerpt, this participant correctly identified the issue (i.e., student motivation):

“The classroom environment sounds like a typical “you sit while I talk” lecture design. The only students who will do well in this kind of environment are highly self-motivated learners. In a lower level course taught to students with a variety of backgrounds and a variety of reasons for taking the course, [the instructor] needs to find ways to engage and motivate all the students.”

However, many participants were off-target in identifying the issue, suggesting that students were at fault (e.g., lazy students) or that other external factors (e.g., class offered at bad time of the day), beyond the instructors' control, were the possible reason for the resulting student performance and lack of engagement. In terms of identifying the appropriate strategies, the following is an example of a response that infused learner-centered strategies:

“I would go through the exam to identify the case of the low scores—misunderstanding of fundamental concepts, mistakes related to specifics, or inability to apply knowledge to new problems. [The instructor] should

then design group classroom activities/problem sets/examples, etc., to teach the information the students don't understand. By breaking the class up into smaller groups to work on problems, [the instructor] can circulate through the classroom and identify exactly what students are having trouble with. This will also make him more accessible to the students. [The instructor] should also incorporate as many "real world" problems/examples as he can to help motivate the "this course is required" students. [In the future], he should redesign his lectures to include more group work, mini assessments like in-class problems or quizzes, and multiple explanations of fundamental concepts for students who are struggling with the material. These techniques will help [the instructor] keep tabs on how the students are doing on a day-to-day basis, motivate the less motivated students, and make [the instructor] more approachable."

On the other hand, other participants offered less nuanced responses, simply stating that the instructor should motivate the students or engage them more, without offering any concrete strategies. In the pre-scenario one student suggested that "the problem, from the students' side, will begin to resolve itself; low midterm scores are very motivating." These types of responses do not place a shared responsibility between the student and teacher, and are therefore reflecting a teacher-centered paradigm.

Discussion

The results of this study suggest that graduate students enrolled in a pedagogy seminar focusing on learner-centered approaches do appear to gravitate toward learner-centered teaching over time. However, the greatest shift toward a learner-centered approach occurred on the self-reported self-efficacy survey, and the shift was much less pronounced on assessments that more closely mimicked actual teaching situations (i.e., syllabus development and classroom scenarios). Moreover, the self-efficacy data also show that increases in confidence using learner-centered pedagogies do not equate with decreases in instructor-centered approaches: generally, participants gained in confidence

in *both* learner- *and* instructor-centered pedagogies. Regarding the classroom scenario data, the participants did exhibit better skills at identifying reactive and proactive strategies for improvement. However, they were, typically, still unable to identify the underlying problem or issue-at-hand in the scenario, which begs the question of whether or not they will know the appropriate time to use specific interventions if they cannot properly diagnose the problem.

With regard to the Barr and Tagg (1995) Learning Paradigm, graduate students did tend to focus less on more traditional instructor-centered portions of a syllabus (e.g., course prerequisites, statement on academic fraud) on the post-test than the pre-test, and more often identified learner-centered components (e.g., learning goals/objectives, tips for success) on the post-test. Similarly, graduate students did exhibit a significant increase in their self-efficacy with regard to their adoption of more learner-centered techniques (see Tables 1 and 2), but it is important to reiterate that their self-efficacy with the adoption of teacher-centered techniques also increased significantly. Finally, while graduate students did indicate that they would be more explicit in their assessment goals on their syllabi over merely describing the various assignments on the post-test than the pre-test (See Figure 2), they did not evidence any new ways to assess the problem presented in the teaching scenario.

In terms of the implications of Social Cognitive Career Theory in relation to the study's findings, it did appear that the pedagogy seminar did increase students' self-efficacy with using learner-centered approaches, and it appeared that they planned to continue to use them in future syllabi that they may construct. However, actually using learner-centered approaches in practice remained elusive: not only were the graduate

students no more likely to be able to diagnose the underlying problem presented in the teaching scenario on the post-test than they could on the pre-test, they were not statistically more likely to offer learner-centered proactive or reactive strategies to address the problem either.

One of the important tenets of SCCT is that goal attainment is the result of combination of factors, including self-efficacy, but also: personal goals, outcome expectations, and activity practice (Lent, Brown, & Hackett, 1994). Thus, as the results of this study show, simply increasing self-efficacy is not the only factor necessary in reaching goal attainment (in this case being the practice of learner-centered pedagogy in one's teaching). Indeed, this study's findings may suggest that graduate students require other SCCT-associated factors to be successful, such as multiple opportunities for practice using learner-centered approaches (Ebert-May et al., 2011), and institutional or departmental supports for their adoption. In fact, given related literature that even tenured and tenure-track faculty are unfamiliar and/or uncomfortable with learner-centered pedagogies and thus are not using these approaches in their teaching (Webber, 2012; Yanowitz and Hahs-Vaughn, 2007; Brown, Kirkpatrick, Greer, Matthias, & Swanson, 2009), the need for a safe place for graduate students to repeatedly practice learner-centered pedagogies becomes even more important, since they are likely not receiving opportunities for practice in their teaching assistant roles or effective learner-centered modeling from their own professors.

Limitations

Before we discuss the implications of our findings, there were several limitations to this study. First, there were only 26 participants in the pedagogy seminar, limiting statistical power and making more granular analyses by demographic characteristics, discipline, and prior teaching experience impossible. Moreover, the 26 participants were volunteers, implying that they may have had greater motivations to improve their teaching than others. Indeed, 75 percent indicated on the survey that their future career ambition was to become teaching (and not research) faculty. Finally, all of the assessments were conducted within the same semester during which the seminar took place; thus no long-term impacts on teaching were examined. To be sure, the most suitable assessment of changes in pedagogical approaches to teaching would be to observe *actual* teaching.

Implications for Practice

The finding that there may be a possible disconnect between self-reported attitudes (or efficacy) and actual behaviors with regard to learner-centered pedagogy lends itself to several important implications. First, in terms of the seminar, the instructors should integrate more opportunities to practice teaching in real settings over the course of the seminar. Or, the instructors might limit enrollment in the seminar to only those who are teaching during the same semester.

Alternatively, the instructors of the pedagogy seminar might consider trying to strike a greater balance between the theoretically- and holistically-driven portions of the seminar and the more specific, “hands-on” portions, such as techniques that graduate students can use to facilitate a more learner-centered classroom environment. The

pedagogy seminar presented a myriad of learning theories and best teaching practices to graduate students in an attempt to introduce them to the wide-variety of current thinking on effective teaching and learning. However, prior research has shown that teaching interventions that focus on the adoption of one specific technique are likely to be more successful in subsequent adoption by graduate students (e.g., Pentecost et al., 2013; Smith, 1974). While the purpose of this particular seminar was not intended to be quite that narrow, perhaps a “meeting-in-the-middle” can be achieved, where a limited number of theories and practices are discussed, with more time allotted to practice.

Directions for Future Research

Future researchers should bear in mind that changes in attitudes on self-reported assessments may not necessarily equate with real changes in teaching behaviors. Social cognitive career theory (Lent, Brown, & Hackett, 1994) suggests that repeated practice, when combined with increased self-efficacy, influences goal attainment; thus, additional practice with using learner-centered approaches in the classroom may be critical in actualizing real and long-term changes in teaching behaviors. Finally, the differences in the open-ended versus close-ended responses on the syllabus development assessment may suggest to future researchers to consider letting respondents fill in their responses instead of react to forced-choice questions.

As stated previously in the study limitations, our next step is to observe participants’ actual teaching, in order to ascertain whether they are incorporating learner-centered pedagogies into their teaching. In addition, time series analyses may be beneficial in order to document which workshop interventions were the most influential in changing teaching orientations. Finally, future research should incorporate a more

experimental design, in which students' attitudes and behaviors from the pedagogy seminar are compared to a sample of students who have similar interests in teaching, but have not participated in a pedagogy seminar. However, this study and the pedagogy seminar are important first steps in attempting to directly influence and understand how future college teachers embrace learner-centered paradigms that promote student learning.

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