

Graduate Teaching Assistants' Sense of Teaching Self-Efficacy in a College of Agricultural Sciences and Natural Resources

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Abstract

The Teachers' Sense of Efficacy Scale was used to measure graduate teaching assistants' perceived self-efficacy in four constructs: (a) overall teaching efficacy, (b) student engagement, (c) instructional strategies and (d) classroom management. Graduate teaching assistants in the College of Agricultural Sciences and Natural Resources at the University of Tennessee were moderately efficacious in instructional strategies, student engagement, classroom management and overall teaching efficacy. Furthermore, a majority of graduate teaching assistants did not have prior teaching experience. This coupled with the fact that a majority did not participate in university pedagogical training may partially explain why the graduate teaching assistants did not possess a high sense of self-efficacy in their overall teaching abilities or their self-efficacy in student engagement, instructional strategies and classroom management. With that in mind, future research should examine the explanatory power of various prior teaching experiences and teaching and learning training opportunities. This information should aid departments and colleges of agriculture in selecting and training graduate teaching assistants. Moreover, investing in the development of a high sense of teaching efficacy among graduate teaching assistants may prove to be an important element in ensuring the educational quality of undergraduate education.

Introduction

A growing trend in recent years has been the increased use of graduate teaching assistants in undergraduate education. Several factors have contributed to

this, including administrative pressure to reduce instructional cost (Bettinger and Long, 2004) and the shifting of faculty responsibilities to include more graduate education and research (Shannon, Twale and Moore, 1998). In this environment, graduate teaching assistants are being used more often as primary instructors instead of supporting faculty instruction, which has placed them in a position to have a greater influence on the quality of undergraduate education (Weidert et al., 2012). To that end, many graduate teaching assistants have been thrown into the classroom to fulfill the role of instructor for a course with limited teaching experience (Drake, 1997) and are "expected to be experts in their discipline and knowledgeable of the appropriate pedagogical strategies for undergraduate instruction" (Luft et al., 2004, p. 212). Consequently, they are often subjected to the sink or swim method of learning to teach and as a result, concerns have been raised regarding the effectiveness of graduate teaching assistants and their educational influence (Bettinger and Long, 2004). Some universities have responded by offering courses or training in teaching and learning, while others have made little effort to provide training for these graduate students turned instructors (Komarraju, 2008).

This could be problematic for colleges of agriculture, who have recently been charged with the task of improving instruction and teacher effectiveness (National Research Council, 2009). With this in mind, one factor contributing to teacher effectiveness is self-efficacy (Shaughnessy, 2004). Self-efficacy or efficacy expectation is the level to which people feel they can perform up to expectation (Bandura, 1993). Bandura (1993) suggested people by

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nature are unsettled or anxious pertaining to uncertainty and instead of facing apprehension about the unknown, people foster a sense of self-efficacy to predict the outcomes of their efforts. A person's motivations, actions, effort and perseverance are all altered by one's self-efficacy (Bandura, 1997). Self-efficacy is not a set of traits people do or do not possess, but instead, self-efficacy is an inward and personal analysis of self that helps a person determine whether or not they will be successful at completing tasks. When self-efficacy is high, individuals feel self-assured and have control over the given situation – this control results in success for the individual. While Bandura (1997) acknowledged the significance of having the proper skills to complete a task, he also suggested that having the self-belief of knowing how to use the skills was equally as important.

According to Bandura (1997), self-efficacy is an internal personal factor within social cognitive theory. Thus, self-efficacy is an internal personal factor that influences behavior and the external environment. Bandura posited the three aforementioned determinants, personal factors, external factors and behaviors influence each other bi-directionally, but these influences are not of equal strength and may not occur simultaneously (Bandura, 1997). Additionally, the determinants must be considered within the social construct that the person is operating. These social structures can provide additional resources or restraints that would cause a person's self-efficacy to change based on the given situation (Bandura, 1997). Moreover, self-efficacy beliefs are constructed through mastery experiences, vicarious experiences, verbal persuasion and physiological and affective states (Bandura, 1997). Bandura (1997) stated mastery experiences are the greatest contributor to a strong sense of self-efficacy. If a person masters a skill or situation, that person moves forward with a strong sense of confidence to repeat success in a same or similar situation, thus positively building their self-efficacy. The opposite is true if the person experiences failure in a given situation.

When the theory of self-efficacy is tied to understanding teacher effectiveness it becomes labeled teacher efficacy or teaching efficacy (Wolf, 2011). Teacher efficacy is a person's self-belief in their "capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (Tschannen-Moran et al, 1998, p. 233). Teacher efficacy is cyclical in nature (Tschannen-Moran et al, 1998).

Greater efficacy leads to greater effort and persistence, which leads to better performance, which in turn leads to greater efficacy. The reverse is also true. Lower efficacy leads to less effort and giving up easily, which leads to poor teaching outcomes, which then produce decreased efficacy. Thus, a teaching performance that was accomplished with a level of effort and persistence influenced by the performer's sense of efficacy, when completed, becomes the past and a

source of future efficacy beliefs. (Tschannen-Moran et al, 1998, p. 234)

Wolf (2011) stated that while many components have been argued to contribute to a teacher's sense of self-efficacy, research has indicated teaching experience is a key element to increased self-efficacy. Additionally, a teacher's sense of efficacy is influenced by their training and past experiences (Shaughnessy, 2004). Training and past experience directly relate to teachers' observable behaviors in the classroom and are pieces of the conceptual model that appear to influence the ability of the teacher in the classroom. Many graduate teaching assistants are expected to fill the role of instructor without any prior teaching experience or training (Komarraju, 2008). Graduate teaching assistants' lack of experience or training has the potential to negatively impact the quality of undergraduate education. Research has shown teaching efficacy is related to student achievement and motivation, effort exerted in teaching (Tschannen-Moran and Hoy, 2001), planning and organization (Allinder, 1994), perseverance through challenges and undesired results (Goddard et al., 2004) and willingness to modify instructional methods to meet student needs (Guskey, 1988). Conversely, if graduate teaching assistants' pedagogical knowledge, skills and self-efficacy are cultivated, this could have a positive effect on undergraduate education. Furthermore, if graduate teaching assistants can be effective alternatives to faculty, this might allow institutions of higher education to reduce undergraduate instructional cost and permit tenure-track faculty to focus on graduate education, research and outreach without negatively impacting the quality of undergraduate education.

Purpose and Objectives

The National Research Council (2009) indicated the need for improvements in undergraduate education and called for an increase in research-based instructional strategies to promote student learning. Because under-prepared graduate teaching assistants are increasingly being used as instructors and teaching efficacy plays a pivotal role in the behaviors exhibited by teachers, an investigation into the teaching efficacy of graduate teaching assistants is warranted. Therefore, the purpose of this study was to describe the teaching efficacy and preparation of graduate teaching assistants in the College of Agricultural Sciences and Natural Resources at the University of Tennessee. The following objectives framed this study:

1. Describe the teaching and learning preparation of graduate teaching assistants.
2. Describe the overall teaching efficacy of graduate teaching assistants.
3. Describe the efficacy in instructional strategies of graduate teaching assistants.
4. Describe the efficacy in student engagement of graduate teaching assistants.
5. Describe the efficacy in classroom management of graduate teaching assistants.

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6. Compare overall teaching efficacy, efficacy in instructional strategies, efficacy in student engagement and efficacy in classroom management of graduate teaching assistants based upon prior experience and university training.

Methodology

Research Design and Population

The research design was descriptive survey research and consisted of a census of all graduate teaching assistants (N = 22) in the College of Agricultural Sciences and Natural Resources at the University of Tennessee. Thus, the results of the study should not be generalized beyond the College of Agricultural Sciences and Natural Resources at the University of Tennessee. The sampling frame was established by contacting the graduate coordinators of each department in the College of Agricultural Sciences and Natural Resources at the University of Tennessee. The graduate coordinators were asked to supply the names and emails of all graduate teaching assistants in their department. Upon approval by the Institutional Review Board at the University of Tennessee, invitations to participate in the study were electronically sent to all graduate teaching assistants in the sampling frame during the Fall 2012 academic semester. To maximize participation, sampling procedures as recommended by Dillman et al. (2009) were followed. An initial email was sent to potential participants informing them of the forthcoming study and inviting them to participate. The second email was sent a week after the first and contained a link to the instrument. Additionally, two follow-up emails, which contained links to the instrument, were sent to the participants as reminders. After the emails and a follow-up phone call all graduate teaching assistants responded, thus a census of the population was obtained.

The graduate teaching assistants' ages ranged from 22 to 33 years old with a majority of the graduate teaching assistants between 22 and 26 years old (M = 25.1, SD = 3.0). Of the 21 graduate teaching assistants that reported gender, 12 (57.1%) were male and 9 (42.9%) were female. The self-reported ethnicity of the graduate teaching assistants was 14.3% Asian, 9.5% Black or African American and 76.2% White and all but one of the graduate teaching assistants were pursuing a master's degree with the remaining graduate teaching assistant pursuing a doctorate. During the Fall 2012 academic semester, the number of courses taught or assisted by the graduate teaching assistants ranged from 1 to 3 with a mode of 1.

Instrumentation and Data Analysis

The data were collected using Qualtrics, an online survey software system, to administer the Teachers' Sense of Efficacy Scale (Tschannen-Moran and Hoy, 2001). The Teachers' Sense of Efficacy Scale contains 24 Likert-type items that measure teachers' perceived self-efficacy in four constructs: (a) overall teaching efficacy,

(b) student engagement, (c) instructional strategies and (d) classroom management. However, the researchers excluded one item that pertained to involving parents of students, because they deemed that this is not typically applicable in college teaching situations. Sample items on the adapted Teachers' Sense of Efficacy Scale include, "How much can you do to get through to the most difficult students," "How well can you respond to difficult questions from your students," and "How much can you do to control disruptive behavior in the classroom?" Responses were measured on a scale of 1, nothing, to 9, a great deal. Reliabilities for the Teachers' Sense of Efficacy Scale reported by Tschannen-Moran and Hoy (2001) were $\alpha = .94$ for overall teaching efficacy, $\alpha = .91$ (efficacy in instructional strategies), $\alpha = .87$ (efficacy in student engagement) and $\alpha = .90$ (efficacy in classroom management). For this study, post-hoc reliabilities for the adapted instrument in overall teaching efficacy, efficacy in instructional strategies, efficacy in student engagement, efficacy in classroom management were .95, .92, .83 and .91, respectively. In addition, after completing the adapted Teachers' Sense of Efficacy Scale, the graduate teaching assistants also completed a 10 question demographic survey that included open and closed-ended questions.

Data were analyzed using IBM SPSS version 20. Constructs were summated to analyze the data. Descriptive parameters (frequencies, percentages and means) were used to describe the demographic characteristics of the graduate teaching assistants and responses for individual items of the adapted Teachers' Sense of Efficacy Scale. In addition, based on prior research (Wolf, 2011), the researchers combined response categories 1–3, 4–6 and 7–9 into low, moderate and high self-efficacy, respectively.

Results

Objective 1

Describe the teaching and learning preparation of graduate teaching assistants. A majority (76.2%) of the graduate teaching assistants indicated they did not receive training in teaching and learning by the university. Those who did receive training completed one of the following: (a) graduate teaching assistant orientation, (b) training on being a student-athlete tutor provided by the university's athletics student life center, or (c) the best practices in teaching program offered by the university's graduate school. For these programs, the training hours ranged from one to nine. Furthermore, a majority (71.4%) of graduate teaching assistants had no prior teaching experience. Those who had prior teaching experience indicated they had at least one of the following roles: (a) secondary substitute teacher, (b) Sunday school teacher, (c) secondary academic tutor, (d) postsecondary academic tutor, (e) workshop presenter and/or (f) equine riding instructor.

Objective 2

Describe the overall teaching efficacy of graduate teaching assistants. The summated mean for overall teaching efficacy was 6.0 (SD = 1.3) with a range of 2.0 to 7.9. Four graduate teaching assistants (18.2%) possessed high self-efficacy in their overall teaching ability, 17 (77.3%) possessed moderate self-efficacy in their overall teaching ability and one (4.5%) possessed low self-efficacy in his or her overall teaching ability.

Objective 3

Describe the efficacy in instructional strategies of graduate teaching assistants. The summated mean for efficacy in instructional strategies was 5.9 (SD = 1.7). As shown in Table 1, a majority of the graduate teaching assistants perceived themselves as having a high sense of self-efficacy or capable of responding to difficult questions, gauging student comprehension of subject matter taught and providing alternative explanations or examples to clarify a concept for students. Furthermore, 50% of the graduate teaching assistants perceived themselves as capable of crafting good questions for their students and a majority of graduate teaching assistants reported low or moderate capability on four items: (a) adjusting your lesson to the proper level for individual students, (b) using a variety of assessment strategies, (c) implementing alternative instructional strategies and (d) providing appropriate challenges for very capable students.

Objective 4

Describe the efficacy in student engagement of graduate teaching assistants. The summated mean for efficacy in student engagement was 5.5 (SD = 1.0). As shown in Table 2, a majority of graduate teaching assistants did not perceive themselves as capable or having low capacity on any of the student engagement items. To that end, the graduate teaching assistants perceived themselves as moderately capable on all student engagement items, thus, perceiving themselves as having a moderate capacity for getting through to the most difficult students, helping students to think critically, motivating students who show low interest, getting students to believe they can do well on school related task, helping students value learning, fostering student creativity and improving the understanding of a student who is failing.

Objective 5

Describe the efficacy in classroom management of graduate teaching assistants. The summated mean for efficacy in classroom management was 6.1 (SD = 1.7). As shown in Table 3, a majority of the graduate teaching assistants perceived themselves as capable of making expectations clear about student behavior, getting students to follow classroom rules and keeping a few problem students from ruining an entire lesson. Additionally, 50% of the graduate teaching assistants perceived themselves as capable of controlling disruptive behavior in the classroom and a majority of graduate teaching assistants reported low or moderate capability

Table 1. Graduate Teaching Assistants' Scores on the Instructional Strategies Self-Efficacy Items

	Low		Moderate		High	
	f	%	f	%	f	%
How well can you respond to difficult questions from your students?	2	9.1	8	36.4	12	54.5
How much can you gauge student comprehension of what you have taught?	2	9.0	8	36.4	12	54.4
To what extent can you craft good questions for your students?	1	4.5	10	45.5	11	50.0
How much can you do to adjust your lessons to the proper level for individual students?	2	9.6	14	66.6	5	23.8
How much can you use a variety of assessment strategies?	4	19.1	10	47.6	7	33.3
To what extent can you provide an alternative explanation or example when students are confused?	1	4.8	7	33.4	13	61.9
How well can you implement alternative strategies in your classroom?	4	19.0	8	38.0	9	42.9
How well can you provide appropriate challenges for very capable students?	4	19.1	7	33.3	10	47.6

Table 2. Graduate Teaching Assistants' Scores on the Student Engagement Self-Efficacy Items

	Low		Moderate		High	
	f	%	f	%	f	%
How much can you do to get through to the most difficult students?	4	18.1	15	68.1	3	13.6
How much can you do to help your students think critically?	1	4.5	14	63.6	7	31.8
How much can you do to motivate students who show low interest in school work?	2	9.0	16	72.7	4	18.2
How much can you do to get students to believe they can do well in school work?	1	4.5	12	54.5	9	40.9
How much can you do to help your students value learning?	1	4.5	12	54.6	9	40.9
How much can you do to foster student creativity?	2	9.0	12	54.5	8	36.3
How much can you do to improve the understanding of a student who is failing?	3	14.3	12	57.3	6	28.6

Table 3. Graduate Teaching Assistants' Scores on the Classroom Management Self-Efficacy Items

	Low		Moderate		High	
	f	%	f	%	f	%
How much can you do to control disruptive behavior in the classroom?	5	22.7	6	27.2	11	50.0
To what extent can you make your expectations clear about student behavior?	1	4.5	8	36.3	13	59.1
How well can you establish routines to keep activities running smoothly?	2	9.0	10	45.4	10	45.5
How much can you do to get students to follow classroom rules?	1	4.8	8	38.1	12	57.1
How much can you do to calm a student who is disruptive or noisy?	2	9.6	10	47.6	9	42.8
How well can you establish a classroom management system with each group of students?	1	5.0	10	50.0	9	45.0
How well can you keep a few problem students from ruining an entire lesson?	1	4.8	7	33.4	13	61.9
How well can you respond to defiant students?	2	9.5	9	42.9	10	47.6

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Table 4. Graduate Teaching Assistants' Teaching Efficacy Differences Based on Experience and Training

	Prior experience				University training			
	Yes		No		Yes		No	
	μ	σ	μ	σ	μ	σ	μ	σ
Student Engagement	5.9	0.50	5.4	1.2	6.1	0.9	5.3	1.0
Instructional Strategies	6.7	1.00	5.8	1.7	6.2	1.4	6.0	1.7
Classroom Management	6.1	1.03	6.3	1.8	6.4	0.8	6.2	1.8
Overall Teaching Efficacy	6.3	0.62	5.8	1.5	6.2	0.9	5.9	1.4

on four items: (a) establishing routines to keep activities running smoothly, (b) calming a student who is disruptive or noisy, (c) establishing a classroom management system with each group of students and (d) responding to defiant students.

Objective 6

Compare overall teaching efficacy, efficacy in instructional strategies, efficacy in student engagement and efficacy in classroom management of graduate teaching assistants based upon prior experience and university training. As described under objective one, the graduate teaching assistants did not have extensive training or experience in teaching and learning; however differences in efficacy scores were found (Table 4). Graduate teaching assistants with prior experience or university training in teaching and learning had higher scores in overall teaching efficacy, student engagement and instructional strategies. For classroom management, graduate teaching assistants with university training had higher efficacy scores in classroom management, but those with prior teaching experience had lower efficacy scores in classroom management.

Summary, Discussion and Recommendations

Being a graduate teaching assistant can be overwhelming for an individual, especially when they are the sole instructor of a class. As Luft (2004) stated "*graduate assistants are expected to be experts in their discipline and knowledgeable of the appropriate pedagogical strategies for undergraduate instruction*" (p. 212), which can place a heavy burden on many graduate teaching assistants. The graduate teaching assistants in the College of Agricultural Sciences and Natural Resources at the University of Tennessee perceived themselves as moderately efficacious in overall teaching efficacy, student engagement, instructional strategies and classroom management. Theoretically, not being efficacious in the aforementioned constructs, which are represented as personal factors in Bandura's (1997) social cognitive theory, may negatively influence graduate teaching assistants' teaching behaviors and ultimately the quality of undergraduate education. Empirically this is important because teaching efficacy is related to teacher effectiveness (Shaughnessy, 2004), student achievement and motivation, effort exerted in teaching (Tschannen-Moran and Hoy, 2001), planning and organization (Allinder, 1994), perseverance through challenges and undesired results (Goddard et al., 2004)

and willingness to modify instructional methods to meet student needs (Guskey, 1988). These findings are also important because teacher efficacy is cyclical in nature – higher efficacy leads to higher performance and lower efficacy leads to lower performance (Tschannen-Moran et al., 1998). Consequently, the graduate teaching assistants in this study may only be performing at moderate levels.

Within each of the measured constructs, there were several areas in which the graduate teaching assistants did not perceive themselves as efficacious. Some of those areas were adjusting the lesson to the proper level for individual students, using a variety of assessment strategies, implementing alternative instructional strategies, providing appropriate challenges for very capable students, establishing routines to keep activities running smoothly, calming a student who is disruptive or noisy, establishing a classroom management system with each group of students and responding to defiant students. Moreover, a majority of graduate teaching assistants did not have prior teaching experience. This coupled with the fact that a majority did not participate in university pedagogical training may partially explain why the graduate teaching assistants did not possess a high sense of self-efficacy in their overall teaching abilities or their self-efficacy in student engagement, instructional strategies and classroom management. With that in mind, future research should examine the explanatory power of various prior teaching experiences and teaching and learning training opportunities. This information should aid departments and colleges of agriculture in selecting and training graduate teaching assistants.

Supporting the need for the research suggested above, differences were found in this study in regard to teaching and training experiences. In general, the graduate teaching assistants that completed training or had prior teaching experience had higher self-efficacy scores. This is encouraging since their teaching and training experiences were minimal (e.g., 1 to 9 hours of university training in teaching and learning). What is more, their self-efficacy beliefs appear to be malleable and this is also encouraging since teaching efficacy stabilizes over time and is difficult to alter once stabilized. (Tschannen-Moran et al., 1998).

Based on the results of this study, the College of Agricultural Sciences and Natural Resources at the University of Tennessee should consider taking action to improve the teaching efficacy beliefs of their graduate teaching assistants. According to Bandura (1997), self-efficacy beliefs are constructed through mastery experiences, vicarious experiences, verbal persuasion and physiological and affective states. Of these sources of self-efficacy, mastery experiences are the greatest contributor to efficacy beliefs (Bandura, 1997). Currently, the College of Agricultural Sciences and Natural Resources does not offer a pedagogical training

program for graduate teaching assistants. Therefore, the researchers recommend the college consider developing a formal pedagogical training program for graduate teaching assistants that includes mastery experiences such as microteachings, peer teachings and lesson plan and syllabi development with an emphasis on those areas where graduate teaching assistants report low to moderate efficacy. Additionally, the college should utilize the university's best practices in teaching program, as the program was intended, to supplement a college or departmental pedagogical program (University of Tennessee, 2013). These recommendations not only align with Bandura (1997), but they are also consistent with Wolf (2011) who stated that teaching experience is the key element to increased self-efficacy. What is more, the college should also consider making the training program a requirement before graduate teaching assistants enter the classroom, since 76.2% are not completing the university's program or the university's graduate teaching assistant orientation. Requiring graduate teaching assistants to participate in a formal pedagogical training program that includes mastery experiences in the areas of low to moderate efficacy identified in this study should positively influence the development of teaching efficacy.

An additional possibility to consider for developing graduate teaching assistants' teaching efficacy is a formalized mentoring program in which graduate assistants are paired with teaching faculty, a representative from a university teaching and learning center, or other experienced educators to provide guidance, support and formal evaluation of the graduate teaching assistant's instruction. As part of the mentoring experience, the researchers suggest mentors and the graduate teaching assistants work together to develop a professional growth plan. The purpose of a professional growth plan is to identify pedagogical weaknesses and establish pedagogical goals and procedures for improving instructional knowledge and practices. Additionally, completing a college teaching methods course and/or a certificate program in teaching and learning may also be viable options for improving teaching efficacy and if available, colleges of agriculture could utilize the educational expertise of departments of agricultural education to improve graduate teaching assistants teaching efficacy.

Future research should investigate the items recommended above and determine the most appropriate avenues for fostering a high sense of teaching efficacy among graduate teaching assistants. Additionally, future research should examine other graduate teaching assistant populations' teaching efficacy beliefs and seek to quantify the impact graduate teaching assistants are having on the quality of undergraduate education. Investing in the development of a high sense of teaching efficacy among graduate teaching assistants may prove to be an important element in ensuring the educational quality of undergraduate education.

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