CSSHE
SCÉES

Canadian Journal of Higher Education
Revue canadienne d'enseignement supérieur
Volume 45, No. 3, 2015, pages 84 - 110

Good Teaching Starts Here: Applied Learning at the Graduate Teaching Assistant Institute

Michele A. Parker, Diana Ashe, Jess Boersma, Robert Hicks, and Victoria Bennett
University of North Carolina Wilmington

Abstract

Increasingly, graduate teaching assistants serve as the primary instructors in undergraduate courses, yet research has shown that training and development for these teaching assistants is often lacking in programs throughout the United States and Canada. Providing mentoring and skill development opportunities for graduate teaching assistants is vital, as many will become the next generation of faculty. This paper discusses the literature on effective training programs, which underscores the importance of consistent feedback from mentors, intrinsic motivation, and practical applications. Afterwards, we examine an existing training program at the University of North Carolina Wilmington. Specifically, we focus on an institute for teaching assistants that helps graduate students understand applied learning as an effective pedagogical modality and helps them implement applied learning lesson plans tailored to their disciplines. Suggestions for strengthening training programs are discussed.

Résumé

Il est de plus en plus courant que des assistants à l'enseignement soient chargés de donner des cours de premier cycle universitaire. Cependant, des études ont démontré le manque de formation et de progrès de ces assistants à l'enseignement, aux États-Unis comme au Canada. Il est donc indispensable d'offrir des occasions de mentorat et de perfectionnement à ces assistants, puisqu'un grand nombre d'entre eux deviendront la prochaine cohorte de professeurs. Cet article traite des recherches effectuées sur les programmes de formation efficaces, ce qui souligne l'importance des commentaires des mentors, de la motivation et de la mise en pratique. Ensuite, nous étudions l'évolution d'un programme de formation à l'Université de Wilmington de la

Caroline du Nord. Notre étude se concentre sur un institut pour les assistants à l'enseignement, qui leur montre que l'apprentissage appliqué est un outil pédagogique efficace. Par la suite, cet institut les aide à mettre en œuvre un plan de leçon d'apprentissage adapté à leur discipline. L'article s'achève par des suggestions d'amélioration des programmes de formation.

Introduction

Since the 1990s, the number of graduate students teaching at larger universities in the United States, Canada, and elsewhere has increased substantially—so much so that the majority of first-year courses in these universities are often taught by graduate students (Austin, 2002; Marbach-Ad, Schaefer, Kumi, Friedman, Thompson, & Doyle, 2012; Wise, 2011). At the same time, the training of graduate teaching assistants (TAs) has received increased attention (e.g., Blouin & Moss, 2015; Boman, 2013; Hoessler & Godden, 2015; Kenny, Watson, & Watton, 2014). The Council of Graduate Schools and the Association of American Colleges and Universities (AAC&U) developed the Preparing Future Faculty (PFF) program, which charged graduate schools with preparing aspiring academics for a career in higher education (DeNeef, 2002; Kniola, Chang, & Olsen, 2012; Wurgler, VanHeuvelen, Rohrman, Loehr, & Grace, 2013). A primary objective of the PFF was to develop TA training programs that prepare graduate students for their roles as graduate teaching assistants and as potential faculty members (Austin, 2002; Boyer, 1991; Dudley, 2009; Shannon, Twale, & Moore, 1998).

Graduate Student and Teaching Assistant Preparation

In 2008, the Canadian Association of Graduate Studies' (CAGS) *Report on Professional Skills Development for Graduate Students* advocated providing graduate students with the best possible preparation for their future roles whether in academia or in other sectors (Aspenlieder & Kloet, 2014). The conceptualization of a Canadian national competency framework for teaching assistants came about in 2012 through the work of the Teaching Assistant and Graduate Student Advancement (TAGSA) Special Interest Group of the Society for Teaching and Learning in Higher Education (STLHE). This framework differs from the work of the Graduate Student Professional Development (GSPD) group that is part of the Professional and Organizational Development Network in Higher Education in the United States, in that TAGSA focused purely on TA development, as opposed to reaching all graduate students in their professional assistantships and internships. From four collaborative conversations within the professional community, the framework was built to represent what a capable TA might look like in the classroom (Korpan, Sheffield, & Verwoord, 2015). For instance, Korpan, Sheffield, and Verwoord (2015) describe targeted knowledge, skill, and social competencies for a first-time TA within the developmental model. The University of Victoria helped simplify the framework given its background in cultivating experienced teaching assistants through TA mentorship via a program formally referred to as Teaching Assistant Consultant (TACs).

Hoessler and Godden (2015) thoroughly reviewed 10 cornerstone documents on Canadian-wide institutional policies, guidelines, and resources on graduate student teaching. They reported that Canadian universities were tasked with the responsibility of training both the TAs and graduate students, as well as with developing and implementing the

programs. In addition to the challenge of a dual outcome emphasis, these programs often face fiscal constraints, which act as restraining forces at the same time as many Western countries call for greater student productivity and employability as outcomes. The sub-committee report referenced in Hoessler and Godden (2015) indicated that preparing TAs should involve practical hands-on training that includes mentoring, monitoring, institution-wide resources, departmental training, course-level discussions, and support from instructors and peers. The document analysis resulted in the authors recommending that training be holistic in order to allow TAs to develop a wide variety of skills, as opposed to a content-delivery-only focus.

Graduate Teaching Assistant Roles Vary

Moreover, the graduate student teaching experience varies wildly across universities and education levels. Traditionally, the role of a graduate teaching assistant is largely to provide instructional support by teaching undergraduate students or performing administrative duties, and this position often serves as the initial stage in the career of an aspiring professor (Blouin & Moss, 2015; Boman, 2013; Park, 2004). Some graduate teaching assistants are more likely to teach in a classroom for the entire school year or semester while other graduate teaching assistants spend limited time in a classroom (Ronfeldt & Reininger, 2012; Weidert, Wendorf, Gurung, & Filz, 2012). Other graduate teaching assistants are responsible for laboratory sections or entire classes, in contrast to their counterparts who grade papers and proctor exams (Diamond & Gray, 1987; Weidert et al., 2012).

Many institutions limit teaching assistant offerings to a voluntary orientation and then deliver content-based departmental training, neither of which seem to provide the comprehensive coverage required to expand TAs' pedagogical knowledge and its application in an ever-changing environment. Contrary to the pivotal nature of their role, many graduate teaching assistants receive training limited to a single day from their university and/or department, or do not undergo formal training at all. Subsequently, they must learn from "on-the-job," "sink-or-swim" experiences alone (Austin, 2002; Chadha, 2013; Gaia, Corts, Tatum, & Allen, 2003; Shannon et al., 1998; Wise, 2011). More progressive graduate teaching training programs offer semester- or year-long courses with new topics organized around weekly or biweekly meetings (Calonge, Mark, Chiu, Thandani, & Pun, 2013; Linenberger, Slade, Addis, Elliott, Mynhardt, & Raker, 2014; Marbach-Ad et al., 2012; Mena, Diefes-Dux, & Capobianco, 2013). These programs may also include faculty mentoring for new teaching assistants as well as offer or require graduate students to take courses on college teaching (Bartlett, 2003). The core of graduate teaching preparation is developing experience, understanding teaching and learning, and mentoring (Stewart, 2013).

Enhancing the Quality of Teaching

Due to a multitude of factors in the United States, Canada, and other Western countries, such as the political climate, economic turmoil, and questioning of the fundamental role of post-secondary education, institutions of higher learning have been challenged by external forces to enhance the quality of teaching, and to produce graduates ready for the workforce (e.g., Bartlett, 2003; Pratasavitskaya & Stensaker, 2010; Stewart, 2013). One way to enhance the quality of teaching and to cultivate workforce readiness is by strategi-

cally allocating resources to prepare graduate student teachers, which can benefit both the undergraduates they teach and mentor (increased efficacy) and themselves (professional development) in an increasingly competitive market (e.g., Aspenlieder & Kloet, 2014). Preparing graduate student teachers presents a concrete opportunity to have a large-scale impact on undergraduate students, as graduate students primarily teach university-required introductory and general education courses. Graduate students further serve as mentors and role models for the behaviours necessary for academic success for our undergraduates, and are often the undergraduates' direct mentors in scholarly and creative activity (Crisp & Cruz, 2009). The results of a recent Gallup-Purdue Index cited mentoring as one of the most potent, and yet underutilized elements that contribute to future engagement at work and overall well-being (Busteed, 2014). Given the increasingly important role that graduate teaching assistants play in their institutions, along with the often restrictive and limited budgets and time available to support them, how could we better train and prepare graduate teaching assistants for their classrooms and their future careers?

The authors of this paper present literature on existing graduate teaching preparation programs, followed by a developmental overview of our Teaching Assistant Institute at the University of North Carolina Wilmington (UNCW) that focuses on development and continuous improvement through scalable applied learning activities. These models may serve other institutions seeking to leverage resources and address constraints of graduate students' teaching preparation in order to enhance the quality of these programs and undergraduate instruction.

Relevant Literature on TA Training Programs

This literature synthesis provides examples of graduate teaching programs and their subcomponents for institutions seeking to enhance the quality of these programs and undergraduate instruction. We searched electronic databases (e.g., ERIC, JSTOR, PsycINFO, and ProQuest Central) using the keywords, "teaching assistants," "training," "graduate teaching assistants," (similar to Hoesler & Godden, 2015) and "training programs." We sought peer-reviewed publications from 2005 to 2015, with emphasis on publications in the last 5 years. Articles outside of this range such as Austin (2002) and Shannon et al. (1998) were widely cited and thus included in our review.

The review consists of extant literature globally on teaching assistantships, mandatory versus voluntary graduate teaching training programs, and institution-wide and department/unit-specific programs. Next, there is a discussion of components of quality graduate student training programs, particularly mentoring programs and specific types of student-centred pedagogical training, upon which we have based the improvements in the TA Institute at UNCW. We acknowledge fully that in order for graduate students to become effective TAs, "the scope and quality of [training programs] matter" (Hoessler & Godden, 2015, p. 84).

Teaching Assistantships

Graduate students with teaching assistantships have indicated that their overall graduate school experiences are made more meaningful by those assistantships, and that the assistantships prepare them for a career in academia by helping them to cultivate their

teaching skills (Border & Barba, 1998; McGoldrick, Hoyt, & Colander, 2010). Productive teaching assistantships are applied learning experiences through which graduate students develop teaching skills. Teaching assistants create lesson plans, lead discussions, grade assigned work, and employ a multitude of teaching techniques, as well as improve their classroom management skills (Cahalan, 2013; Weeks & Harbor, 2014; Weidert, et al., 2012).

Mandatory Versus Voluntary Training Programs

Most institutions seem to offer a voluntary orientation followed by content-based departmental training, none of which have seemed thus far to meet the needs for TAs' pedagogical knowledge, and application of such knowledge (Korpan, 2014). Moreover, some mandatory graduate teaching assistant training focuses on a college-wide orientation, then a multi-day departmental training. Specifically, TAs are engrossed in learning the university policies and procedures, as well as individually selected topics regarding teaching methodologies, student learning styles, and instructional design. Departmental training focuses on specifics of the discipline, and often on transitioning a student's mindset to that of a teacher's (Roehrig, Luft, Kurdziel, & Turner, 2003).

Interestingly, universities where training is optional suffer from low participation and completion rates—perhaps a remnant of reward structures where teaching remains secondary to research. For example, a study at Purdue University chronicled the experiences of 28 doctoral engineering teaching assistants and revealed that only 43% of those teaching assistants attended the weeklong training seminar at the beginning of the semester, and an even lower 29% attended workshops throughout the semester (Mena et al., 2013). Furthermore, the University of Iowa's training program had 11 teaching assistants, a low rate, participate for both semesters, despite the University offering an additional, extrinsic reward by paying student fees for all program attendees (Linenberger et al., 2014). Complicating this schema, it is common for a university-wide teaching assistant program to be voluntary at the university level, but mandatory in select departments, as is the case at the UNCW.

Institution-Wide, Departmental or Unit-Based Programs

Literature on institution-wide graduate teaching preparation programs (Calonge et al., 2013; Carleton University, n.d.; Carnegie Mellon, n.d.; Chadha, 2013; Gaia et al., 2003; Kember, 2009; Vanderbilt University's Center for Teaching, n.d.) includes expansive programs from The University of Hong Kong and King's College of London. These two institutions each enrol upwards of 8,000 graduate students (City University of Hong Kong, 2015; King's College London, 2015). The former institution has a graduate teaching program that lasts two semesters, while the latter institution has a program that lasts two years (Chadha, 2013; Kember, 2009). Many Canadian institutions offer courses, workshops, programs, and one-on-one services through teaching support centres (Hoessler & Godden, 2015). Meanwhile, Pentecost, Langdon, Asirvatham, Robus, and Parson (2012) provided positive survey results, in comparison to baseline data, for an annual, voluntary, three-day teaching assistant training program focused on student-centred pedagogy.

Other institution-wide preparation for graduate student teaching tends to have an annual day-long or partial-day session. Regardless of length, each program had an active learning or applied learning experience, such as role-play. Institutionally, one-on-

one meetings, classroom observations with feedback, peer mentoring, workshops, and pedagogical training were common (see Appendix for a quick overview of more intensive, institution-wide programs outside of Canada). For reviews of Canadian centres and teaching certificates, refer to available research (e.g., Aspenlieder & Kloet 2014; Kenny, Watson, & Watton, 2014).

The American and Canadian literature we reviewed on departmental or unit-based graduate teaching programs likewise revealed variability. Some departments offered single-day training while others offered multi-day or week-long training (e.g., Boman, 2013; Hoessler & Godden, 2015). In Canadian institutions, Hoessler and Godden (2015) documented that departments offered a range of support, such as "annual orientation and training sessions, continuous seminars on teaching, and courses on how to support learning within their respective disciplines" (p. 3). Additionally, they found that generally, senior graduate students who had prior experience as TAs could serve as informal mentors to new graduate students with no prior work experience as TAs (Hoessler & Godden, 2015). In other words, the diversity of programs that institutions and departments offer are matched by significant deviations in the scope of training afforded to the TAs.

In one study, students who had teaching assistants who received more days of training rated their courses as less difficult and very well paced (Shannon et al., 1998). In the Chemistry Department at the University of Maryland, in the United States, Marbach-Ad and colleagues (2012) developed a program to help new graduate teaching assistants transition into their new roles as junior faculty. The course lasted six weeks; during each week, graduate teaching assistants began by discussing any problems they encountered that week and then the instructor introduced a new topic. Overall, participants indicated that the course was extremely beneficial and they felt that their teaching skills improved. Undergraduate end-of-year course evaluations corroborated the graduate students' attitudes and beliefs. Specifically, teaching assistants enrolled in the course received significantly higher ratings for "effective teaching, respecting students, and being prepared" (Marbach-Ad et al., 2012, p. 871) than teaching assistants who did not participate in the course. This study and others that tie training to student learning outcomes are crucial to overcoming, as Boman (2013) notes, an overreliance on satisfaction ratings from training participants.

Components of Quality Graduate Student Training

Research emphasizes the importance of consistent feedback from mentors (Boyle & Boice, 1998; Komarraju, Musulkin, & Bhattacharya, 2010; Nick et al., 2012), multiple workshops throughout the semester (Mena et al., 2013; Richards, Vasquez, & Payne, 2012), and observing teaching assistants within the classroom or laboratory (Cahalan, 2013; Calonge et al., 2013). Additionally, these studies indicate that mandatory teaching assistant training programs have more widespread effects compared to volunteer-based programs.

Mentoring. In graduate teaching preparation, mentoring can be threefold in that (1) faculty can serve as mentors for TAs, (2) more senior TAs can mentor newer TAs, and (3)TAs may serve as mentors for undergraduates. Literature emphasizes the need for consistent feedback from faculty mentors (Austin, 2002; Calonge et al., 2013; Cho, Kim, Svinicki, & Decker, 2011). Teaching assistants benefit most when they meet regularly with mentors, as they become aware of which aspects of their teaching they need to improve and they receive advice on how to strengthen their teaching abilities (Austin, 2002; Ca-

halan, 2013; Calonge et al., 2013; Chadha, 2013; Cho et al., 2011). The mentoring relationship has also proven beneficial to graduate students in professional development by helping them to become independent thinkers and researchers, and strengthening their presentation skills for conferences (Lechuga, 2011).

Also, senior graduate students can serve effectively as junior mentors and offer valuable advice to graduate students with no prior teaching assistant experience (Wise, 2011). At Concordia University, for example, the GradProSkills development program employs up to 14 graduate students per academic year as "workshop assistants, language group leaders, web maintenance personnel, and program development team members" (Venkatesh, Rabah, Lamoreux-Scholes, Pelczer, Urbaniak, & Martin, 2014, p. 42). Research has shown that the mentor relationship between graduate students is mutually beneficial; specifically, graduate students provide each other with advice on teaching, and other aspects of graduate school, such as time management and personal issues (Wise, 2011). Relational demography may also help graduate student mentors and their undergraduate mentees overcome initial difficulties, finding the common ground needed to form close relationships (Tsui & O'Reilly, 1989). According to the research literature, at times, graduate students can be more effective mentors to undergraduates than faculty in areas of professional development, networking, and project collaboration (Johnson, 2007; Lopatto, 2010; Pfund, Pribbenow, Branchaw, Lauffer, & Handelsman, 2006).

Observation of teaching. Teaching assistants can strengthen their teaching abilities through observation. Some techniques used are reviewing their own teaching via video recording (Cahalan, 2013; Calonge et al., 2013), having faculty members and other teaching assistants observe their teaching, and viewing faculty teacher-scholars in the classroom (Chadha, 2013; Gaia et al., 2003). Video recording is extremely beneficial for providing feedback on teaching assistants' performance because "approximately 82% of teachers' communications are nonverbal" (Cahalan, 2013, p. 45). Thus, video recording provides optimal performance enhancement because mentors can reference specific behaviours when providing feedback and students become aware of problematic body language (Cahalan, 2013; Calonge et al., 2013). Teaching assistants benefit from having their teaching observed by both faculty members and other graduate students because multiple observers at different career stages can offer richer advice than a single observer or a single group. Furthermore, research has shown that teaching assistants benefit from exposure to teaching styles of faculty scholars; these experiences allow TAs to model faculty behaviour and develop additional teaching skills (Chadha, 2013; Gaia et al., 2003).

Pedagogical Training

Aspenlieder and Kloet (2014) examined 23 graduate courses on teaching offered by Canadian institutions and reported that most courses lasted more than one semester. Assessments included a teaching portfolio, teaching philosophy, class participation, and teaching a short lesson. Boman (2013) echoes these findings, and also speaks of microteaching sessions. In terms of learning outcomes for the 23 courses, the similarities included developing teaching skills, using research as a basis for teaching practices, and gaining motivation for inward reflection. Overarching themes involved putting a greater emphasis on practice rather than theory and developing pedagogical tools (Aspenlieder & Kloet, 2014). Meanwhile, Kenny et al. (2014) examined graduate teaching at 13 Cana-

dian universities from November 2012 to January 2013. The learning outcomes for these programs fell into one of two categories: "(i) practical aspects of teaching and (ii) practical aspects of teaching and the scholarship of teaching and learning" (p. 7). Regardless of learning outcomes, all programs emphasized at least three of the four major areas: (a) the fundamentals of teaching, (b) professional skills development, (c) applying newly learned concepts to one's teaching practice, and (d) engaging in the scholarship of teaching and learning if applicable.

Problem-based learning. Problem-based learning is defined as "a student centered approach to learning which enables the students to work co-operatively in small groups [in order] to seek solutions to situations/problems" (Kong, Qin, Zhou, Mou, & Gao, 2014, p. 459). Problem-based learning has been shown to be an effective alternative to the traditional classroom (Duschl, 2008; Kong et al., 2014; Lehrer & Schauble, 2006; Pease & Kuhn, 2010). Specifically, problem-based learning promotes critical thinking, communication skills, student motivation, and a lifelong desire to learn (Guerra & Kolmos, 2011; Jeager & Adair, 2013; Kong et al., 2014). For problem-based learning classrooms to be most effective, the problem situations must allow for student collaboration, while remaining adaptable to students' existing knowledge, and applicable to real-world problems (Jaeger & Adair, 2013; Savery, 2006; Schmidt, Rotgans, & Yew, 2011).

Flipped classrooms. In the flipped classroom, the lecture is recorded and posted online for students to peruse before class. In the classroom, students complete homework-type exercises and participate in-group activities that engage concepts at higher levels, with the professor available to answer questions and provide feedback (Baepler, Walker, & Driessen, 2014; Chen, Wang, Kinshuk, & Chen, 2014). Flipped classrooms are beneficial to students when combined with active learning classrooms (Baepler et al., 2014; McLaughlin et al., 2014; Roehl, Reddy, & Shannon, 2013) because active learning classrooms "typically feature tables with moveable seating that supports small group work" (Baepler et al., 2014, p. 228). Additionally, accountability features, such as quizzes, prompt students to prepare for class and enhance learning (Kim, Kim, Khera, & Getman, 2014; Mesmer-Magnus, 2014).

Applied learning. The Association of American Colleges and Universities [AAC&U] (2010) defines applied learning as "an understanding and a disposition that a student builds across the curriculum and co-curriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus" (p. 1). Previous studies indicate that students are significantly more likely to retain and apply information they have learned in the innovative classroom compared to traditional methods of teaching (Freeman et al., 2014; Prince, 2004).

In response to an increasing need for quality graduate teaching experiences, some institutions have focused on teaching skills that can be applied in the workplace (Jollands, Jolly & Molyneaux, 2012; Lester & Costley, 2010). For instance, according to Weeks and Harbor (2014), graduate students at Purdue University enrolled in a student teaching course with the goal of enhancing their communication skills with students from different ethnic, cultural, socioeconomic status, and age backgrounds. Nineteen students were placed at a local middle school where they taught alongside the teacher and then independently. At the end of their applied learning experience, students indicated that the course not only strengthened their communication abilities, but also taught them how to explain

complex material in a variety of ways and to adapt their lesson plans to their students' needs. Moreover, students with an interest in a career in academia indicated that the student teaching solidified their desires to teach in higher education (Weeks & Harbor, 2014).

At Iowa State University, Linenberger and colleagues (2014) developed a two-semester training program for students from the science, technology, engineering and mathematics (STEM) disciplines where they were trained on how to implement an applied learning lesson plan within the classroom or laboratory. For example, graduate students might be shown how to guide undergraduates in designing an experiment related to a topic in the lab. Through biweekly meetings, teaching assistants learned about a specific topic and discussed related articles assigned in the previous week. To further facilitate learning, teaching assistants were divided into small groups of three to four and discussed the topics. The results indicated that the 11 TAs who participated in the program over both semesters scored significantly higher on "inquiry-based instruction" over time (Linenberger et al., 2014, p.102). These results suggest that teaching assistant training programs with an applied learning focus increase TAs' knowledge of designing applied learning lesson plans (Calonge et al., 2013; Linenberger et al., 2014).

The gains cited above, combined with the acknowledgement that student-centred modalities such as problem-based learning, flipped classrooms, and applied learning require greater classroom management skills than traditional lectures, coincide with Roehrig et al.'s (2003) recommendation that TAs ought to be taught more about *how* to help students learn best rather than simply *what* to teach. This sentiment is likewise validated by the evaluation results of Pentecost et al.'s (2012) student-centred training model that taught TAs how they were expected to teach in their classes and labs.

The literature on TA training has emphasized the importance of small discussion groups or small group workshops in addition to university-wide programs (Austin, 2002; Gaia et al., 2003; Kember, 2009). Generally, scholars have indicated that successful graduate teaching assistant training programs offer multiple workshops or classes throughout the program that focus on topics of importance to the teaching assistant (Calonge et al., 2013; Linenberger et al., 2014; Marbach-Ad et al., 2012; Mena et al., 2013). The literature also indicates that it is important to have skills workshops that seek to ". . . increase effective teaching behaviours through instructional interventions" (Boman, 2013, p. 102). Accordingly, Boman (2013) and Hoessler and Godden (2015) advocate that TA training programs should be flexible in order to meet the needs of their student population.

TA Institute at University of North Carolina Wilmington (UNCW)

In the last few years, UNCW has incorporated best practices in the literature on graduate student development by creating a university-wide Teaching Assistant Institute. In addition, UNCW is now in the second year of its Quality Enhancement Plan (QEP), which focuses on improving the quality of applied learning across campus and broadening participation across units, schools, departments, and disciplines. The plan is known on campus as Experiencing Transformative Education through Applied Learning (ETEAL). UNCW has adopted applied learning as a model, based on the premise that strong engagement in applied learning enhances students' academic performance in critical thinking, thoughtful communication, and knowledge application. ETEAL aims to improve the quality of teaching and learning for all students and faculty by using research-based instructional strategies.

In accordance with this goal, UNCW established infrastructure support for faculty and staff in applied learning through ETEAL and informs faculty and staff about high-impact teaching methods through the Center for Teaching Excellence (CTE). In partnership with the Graduate School, CTE expanded graduate teaching preparation institution-wide to complement any departmental programming offered to TAs. In consideration of the roles that applied learning and mentoring play in student development, UNCW secured additional funding through an AAC&U *Bringing Theory to Practice* grant to strengthen and expand the applied learning components of the TA Institute after its successful first year. The AAC&U's *Bringing Theory to Practice* program supports initiatives to expand experiential learning, psychosocial well-being, and civic engagement (Barkley, 2009; Braxton, Jones, Hirschy, Hartley, 2008; Harward 2007; National Survey of Student Engagement [NSSE], 2015; Swaner & Finley as cited in Checkoway, 2007).

Each year, out of a population of 1,500 graduate students, UNCW's Graduate School employs 275 graduate students as teaching assistants. These graduate teachers work side-by-side in classrooms, in labs, and in the field with undergraduate students. Each year, graduate students are invited to the voluntary university-wide teaching assistant orientation—whether or not departmental training is offered—with the goal of providing them with a baseline understanding of campus resources and support structures (e.g., counselling services, the registrar's office), and best practices for teaching and learning.

Teaching Assistant Seminar

Having established programming around infrastructure and student support services through an information sharing process, UNCW then turned its attention to maximizing teaching effectiveness. While the initial TA Institute included a teaching-focused segment with small group discussions on pedagogical topics, the authors who developed and facilitated the institute sought a more deliberate incorporation of the University's QEP-related goals within this program, taking the opportunity to enhance overall teaching capacity through the intentional inclusion and training of graduate students in applied learning pedagogies. To accomplish this objective, an additional one-day seminar for graduate assistants was held in August as an extension of our original teaching assistant orientation. The program learning outcomes were to (1) increase the quality of applied learning opportunities available to all UNCW students by expanding training in high-impact methodology to teaching assistants, (2) increase the quantity and visibility of high-impact applied learning opportunities by offering applied learning in additional classes, (3) increase knowledge of best practices in applied learning experiences through the use of intention and critical reflection among graduate students, and (4) increase the civic engagement and psychosocial well-being of teaching assistants through greater engagement with the learning process and greater interaction with the Applied Learning and Teaching Community (a formal group at our institution).

Forty-eight UNCW teaching assistants participated in the voluntary seminar, which lasted four hours. In this seminar, we posed the specific question, "What is applied learning and what foundational knowledge do you need to fully understand and implement it?" This in turn led to our direct engagement with graduate assistants in topic-centred group discussions covering issues such as psychosocial mindfulness, service learning, civic engagement, innovations in pedagogy, best practices in applied learning, and TA imple-

mentation of applied teaching practices. Graduate students could choose from among six breakout sessions in the first seminar, including one session on flipped classrooms, and all students were able to attend two breakout sessions each.

Based on evaluation data, from pre- and post-surveys, and drawing on experience from the first seminar, we honed the focus of the second event, which occurred one month later. We placed greater emphasis on applied learning, new pedagogical techniques, faculty mentoring for graduate students, and familiarizing graduate students with syllabus formation and best teaching practices. Additionally, we provided time for attendees to discuss topics of their choosing with faculty members and to work through new pedagogical techniques from their own disciplinary perspectives. In the second seminar, we focused more specifically on the question, "What does applied learning look like, and how can it help you both now and in the future?" In order to address this complex question, graduate students engaged in an applied learning exercise and later reflected upon it, both individually and collectively, in an exchange with faculty mentors. Participants also had the option of receiving any or all of the following books on effective teaching practices at no cost to them:

- *Student Engagement Techniques: A Handbook For College Faculty* by Elizabeth Barkley,
- *Teaching What You Don't Know* by Therese Hudson,
- *The Art of Being a Scientist: A Guide For Graduate Students and Their Mentors* by Roel Sneider and Ken Larner, and
- *What They Didn't Teach You in Graduate School* by Paul Gray and David Drew.

Materials from the seminar and related resources were also made available to all participants on university webspace.

Methods

At the start of the teaching assistant seminar, we asked attendees to complete a ten-item questionnaire comprised of (a) nine Likert scale questions designed to gauge their understanding of applied learning and related teaching techniques, and (b) one open-ended question eliciting their goals and expectations for training. At the close of the seminar, graduate teaching assistants completed a second corresponding questionnaire and their responses were compared using a paired-sample t-test to assess the change in their attitudes toward, and confidence in, their understanding of applied learning. We received a 94% response rate for this survey (31 of 33 questionnaires were returned), and the demographic characteristics of respondents were representative of the university-level graduate student population. Specifically, (a) 75.9% of attendees identified as female (compared to 68.8% of the graduate student population at UNCW); (b) 88.9% of attendees identified as White (compared to 81.9% of the graduate student population at UNCW); and (c) fewer than 4% of attendees identified as African American, Asian or Pacific Islander, Hispanic, and Multiracial, across each of the designations respectively, (compared to the UNCW graduate student body where 8.3% identify as African American, 3.9% identify as Hispanic, 0.97% identify as Asian or Pacific Islander, and 1.3% identify as Multiracial (University of North Carolina at Wilmington, n.d.).

Pre- and post-test questionnaires were employed as we were unable to carry out a true or quasi-experimental design. Because of (a) the conditions of the AAC&U grant we

received, and (b) the understanding that conveying teaching techniques to teaching assistants would bring clear benefit to attendees and their students, it was deemed inappropriate to withhold the applied learning component of the seminar from any control group. Currently, we are preparing for long-term focus group research to gather information from graduate students who attended and those who did not, in an attempt to establish a comparison group.

Table 1.
Changes in Participants' Attitudes, Opinions and Understanding of Applied Learning After Second Seminar

Survey Questions[a]	*n*[b]	Pre-Mean	Post-Mean	Difference in Means
Q1. I feel that I know how to design an Applied Learning experience	23	2.96	4.00	1.04**
Q2. I have a clear understanding of how Applied Learning impacts students and instructors	26	3.41	4.15	0.74**
Q3. I feel that Applied Learning activities can provide me with skills and experience that are directly relevant to my future	26	4.52	4.70	0.18
Q4. To what extent do you think Applied Learning experiences can enhance student learning?	21	4.41	4.64	0.23
Q5. I feel that I know how to guide students through an Applied Learning experience as the primary instructor or facilitator	23	2.54	4.17	1.63**
Q6. I have all of the resources and information I need to carry out an Applied Learning experience within the next year	22	2.04	3.35	1.30**
Q7. How likely do you think you are to take part in an Applied Learning experience as a student within the next year?	22	4.04	4.35	0.30**
Q8. How likely do you think you are to take part in an Applied Learning experience as an instructor within the next year?	22	3.52	4.00	0.48*

Note. Difference in Means calculated using Paired T-Tests, cases with missing data excluded.
[a]Pre-test and Post-test questions were identical. Response categories fell on a 5-point Likert scale with 'Strongly Agree' (Q1, 2, 3, 5, and 6), 'Greatly Enhanced' (Q4), and 'Very Likely' (Q7, 8) coded as 5.
[b]"I don't know" coded as missing data in the pre-test questionnaire, resulting in lower n value for some questions.
*p <0.05 **p<0.01

Budget

Actual costs for the program were covered by several offices within the university (including the Graduate School, the Center for Teaching Excellence, and ETEAL) and by our AAC&U *Bringing Theory to Practice* grant. Significant expenses included books on effective teaching for each participant, food for each event, a stipend for one faculty facilitator, facilities and technology fees, and instructional materials. The greatest resource expenditure in the institute, however, was the time that the faculty and staff facilitators put into the planning and execution of each event. As expressed in the literature and at other institutions, time is a common limiting factor in TA orientation and training programs.

Feedback and Continuous Improvement

The feedback and evaluation data we received from teaching assistants became a critical element in our planning process for both events, and our final results have further informed our future plans. To improve future iterations of our Teaching Assistant Institute and Seminar, we plan to conduct a survey of all graduate departments to determine the needs of their graduate students and graduate assistants so that we can more effectively target upcoming events. Additionally, we are collecting data on best practices in applied learning training programs here at UNCW that will inform future opportunities for graduate teaching assistants. We have already gathered data on graduate experiences of the second seminar and found that after attending the seminar, graduate students were on average substantially more confident in their ability to lead, design, and carry out an applied learning experience (see Table 1 for details).

Using the feedback we received, we plan to further refine our seminar in order to reach more of the teaching assistants not already served by their own departments, and to provide supplemental teaching skills and experiences to all teaching assistants. Moreover, due to high demand, we are planning future workshops to offer more targeted, specific teaching skills development that focuses on providing teaching assistants with transferrable teaching skills, techniques, and tools. One change we made between the two sessions, for example, was to develop more discipline-specific applied learning activities that graduate teaching assistants could immediately implement in their lab or classroom.

Limitations and Future Research

We acknowledge that our data is from a cross-sectional survey of student's perceptions, which is a criticism of existing research on the efficacy of TA training programs (Boman, 2013). To address such critiques, we plan to collect longitudinal data (e.g., Venkatesh et al., 2014) on how students are using the material gleaned from the TA Institute at our university through focus groups and document analysis of instructional materials. Expansion of the TA Institute may include collaboration through in-person and online networks specifically designed for TAs (Caines, Lye, & Hossain, 2014). The efficacy and impact of these approaches can also be studied longitudinally.

Conclusion

From the array of published research on best practices in preparing graduate students for college-level teaching, and from our own experiences in developing our university's

first institution-wide graduate assistant teacher training program, we found that our campus' goal of enriching and expanding applied learning experiences translates beautifully to the TA training context. While local culture and context must allow for such institution-wide efforts to go forward, the resources necessary for success are simple ones: sufficient funding to supply the program and feed participants, enough cooperation among units to organize and promote—even, ideally, to require—the program, and the support of key faculty to support such initiatives. Faced with multiple constraints, from institutional culture to funding and facilities shortfalls to simple inertia, focusing instead upon the measurable and high-impact outcomes can invigorate efforts to create an institution-wide graduate assistant teacher training program—or imbue an existing one with a robust measure of applied learning pedagogy (Austin, 2002).

Beyond the obvious value for the graduate student participants and the students they will teach, training graduate assistants in pedagogy generates benefits for entire departments, as those nascent faculty members return to their home disciplines and act as ambassadors for the ideas and techniques they have just learned, spreading high-impact practices throughout their own cohort and the larger units in which they teach and study. It is well established through the studies cited here and elsewhere that graduate assistant training programs offer sustained benefits for multiple stakeholders in the university and, taking a career-long view, throughout academia. The addition of the likewise well-supported benefits of applied learning pedagogies and practices to graduate assistant training programs brought measurable improvements for our university and can offer similar outcomes for other institutions as well.

References

Aspenlieder, E., & Kloet, M. V. (2014). Listen up! Be responsible! What graduate students hear about university teaching, graduate education and employment. *Canadian Journal of Higher Education, 44*(3), 20–38.

Association of American Colleges and Universities [AAC&U]. (2010). *Integrative and applied learning VALUE rubric* [preview]. Retrieved from http://www.aacu.org/sites/default/files/files/VALUE/IntegrativeLearning.pdf

Austin, A. E. (2002). Preparing the next generation of faculty: Graduate school as socialization to the academic career. *Journal of Higher Education, 73*, 94–122. doi:10.1353/jhe.2002. 0001

Baepler, P., Walker, J. D., & Driessen, M. (2014). It's not about seat time: Blending, flipping, and efficiency in active learning classrooms. *Computers & Education, 78*(1), 277–236.

Barkley, E. F. (2009). *Student engagement techniques: A handbook for college faculty*. San Francisco, CA: John Wiley.

Bartlett, T. (2003, September 26). The first thing about teaching. *The Chronicle of Higher Education*, *50*(5), p. A10. Retrieved from http://chronicle.com/article/The-First-Thing-About-Teaching/30437/

Blouin, D. D., & Moss, A. R. (2015). Graduate student training still relevant (and missing?) 20 years later. *Teaching Sociology, 43*, 126–136. doi:10.1177/0092055X14565516

Boman, J. S. (2013). Graduate student teaching development: Evaluating the effectiveness of training in relation to graduate student characteristics. *Canadian Journal of Higher Education, 43*(1), 100–114.

Border, C. B., & Barba, W. C. (1998, November). *Graduate student support and the graduate education experience*. Paper presented at the Annual Meeting of the Association for the Study of Higher Education, Miami, FL.

Boyer, E. L. (1991). Preparing tomorrow's professoriate. In J. D. Nyquist, R. D. Abbott, D. H. Wulff, & J. Sprague (Eds.), *Preparing the professoriate of tomorrow to teach* (pp. 3–11). Dubuque, IA: Kendallmunt.

Boyle, P., & Boice, B. (1998). Systematic mentoring for new faculty teachers and graduate teaching assistants. *Innovative Higher Education, 22*(3), 157–179.

Braxton, J. M., Jones, W. A., Hirschy, A. S., & Hartley, H. V., III. (2008). The role of active learning in college student persistence. *New Directions for Teaching and Learning, 2008*(115), 71–83.

Busteed, B. (2014, October 7). *The biggest blown opportunity in higher ed history*. Retrieved from http://www.gallup.com/businessjournal/178082/biggest-blown-opportunity-higher-history.aspx

Cahalan, J. M. (2013). Teaching classroom videorecording analysis to graduate students: Strategies for observation and improvement. *College Teaching, 61*(2), 44–50.

Caines, S., Lye, L., & Hossain, M. R. (2014, June). *Teaching assistant training to enhance graduate engineering education*. Paper presented at the Proceedings of the Canadian Engineering Education Association, Canmore, Alberta. Retrieved from http://library.queensu.ca/ojs/index.php/PCEEA/article/view/5858/5581

Calonge, D. S., Mark, K-P., Chiu, P. H. P., Thandani, D. R., & Pun, C. F. K. (2013). Extreme-Teaching-2 (XT^2): Evaluation of an innovative semester-long intensive GTA training program based on microteaching. *International Journal of Teaching and Learning in Higher Education, 25*(1), 129–143.

Carleton University. (n.d). *TA support*. Retrieved from http://carleton.ca/tasupport/

Carnegie Mellon. (n.d.). *Support for Graduate Students*. Retrieved from http://www.eberly.cmu.edu/services/graduate-students

Carnegie Mellon University. (n.d.). *Enrollment facts—institutional research and analysis*. Retrieved from https://www.cmu.edu/ira/EnrollmentFacts/

Chadha, D. (2013). Reconceptualizing and reframing graduate teaching assistant (GTA) provision for a research-intensive institution. *Teaching in Higher Education, 18*, 205–217. doi:10.1080/13562517.2012.696537

Checkoway, B. N. (2007). Engaged learning, student mental health, and civic development: Can we demonstrate the relationship? *Peer Review*, *9*(3). Retrieved from https://www.aacu.org/publications-research/periodicals/engaged-learning-student-mental-health-and-civic-development-can

Chen, Y., Wang, Y., Kinshuk, & Chen, N. S. (2014). Is FLIP enough? Or should we use the FLIPPED model instead? *Computers & Education, 79*, 16–27.

Cho, Y., Kim, M., Svinicki, M. D., & Decker, M. L. (2011). Exploring teaching concerns and characteristics of graduate teaching assistants. *Teaching in Higher Education, 16*, 267–279. doi:10.1080/13562517.2010.524920

City University of Hong Kong. (2015, February 9). *CityU facts & figures*. Retrieved from http://www.cityu.edu.hk/fnf/student.htm/

Crisp, G., & Cruz, I. (2009). Mentoring college students: A critical review of the literature between 1990 and 2007. *Research in Higher Education, 50*(6), 525–545.

DeNeef, A. L. (2002). *The Preparing Future Faculty program: What difference does it make?* PFF Occasional Paper Series No. 8. Washington, DC: Association of American Colleges and Universities.

Diamond, R. M., & Gray, P. (1987). *National study of teaching assistants*. Paper presented at the meeting of Association for the Study of Higher Education Baltimore, MD. Retrieved from http://files.eric.ed.gov/fulltext/ED292360.pdf

Dudley, M. G. (2009). Jumping out of an airplane: A TA's perspective on teaching effectiveness. *Eastern Education Journal, 38*(1), 1–10.

Duschl, R. (2008). Science education in three-part harmony: Balancing conceptual, epistemic, and social learning goals. *Review of Research in Education, 32,* 268–291.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences of the United States of America, 111*(23), 8410–8415.

Gaia, A. C., Corts, D. P., Tatum, H. E., & Allen, J. (2003). The GTA mentoring program: An interdisciplinary approach to developing future faculty as teacher-scholars. *College Teaching, 51*(2), 61–65.

Guerra, A., & Kolmos, A. (2011). Comparing problem based learning models: Suggestions for their implementation. In J. Davies, E. de Graaff, & A. Kolmos (Eds.), *PBL across the disciplines: Research into best practice* (pp. 3–16). Aalborg, Denmark: Aalborg University. Retrieved from http://vbn.aau.dk/ws/files/57931848/PBL_across_the_disciplines_research_into_the_best_practice.pdf#page=11

Harward, D. W. (2007). Engaged learning and the core purposes of liberal education. *Liberal Education, 93*(1). Retrieved from https://www.aacu.org/publications-research/periodicals/engaged-learning-and-core-purposes-liberal-education

Hoessler, C., & Godden, L. (2015). The visioning of policy and the hope of implementation: Support for graduate students' teaching at a Canadian institution. *Canadian Journal of Higher Education, 45*(1), 83–101.

Jaeger, M., & Adair, D. (2013). The influence of students' interest, ability and personal situation on students' perception of a problem-based learning environment. *European Journal of Engineering Education, 39*(1), 84–96.

Johnson, B. W. (2007). *On being a mentor: A guide for higher education faculty*. Mahwah, NJ: Lawrence Erlbaum.

Jollands, M., Jolly, L., & Molyneaux, T. (2012). Project based learning as a contributing factor to graduates' work readiness. *European Journal of Engineering Education, 37*, 143–154. doi:10.2307/256368

Kember, D. (2009). Promoting student-centered forms of learning across an entire university. *Journal of Higher Education, 58,* 1–13. doi:10.1007/s10734-008-9177-6

Kenny, N., Watson, G. P. L., & Watton, C. (2014). Exploring the context of Canadian graduate student teaching certificates in university teaching. *Canadian Journal of Higher Education, 44*(3), 1–19.

Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: An exploration of design principles. *The Internet and Higher Education, 22*(1), 37–50.

King's College London. (2015). *King's by numbers*. Retrieved from http://www.kcl.ac.uk/aboutkings/facts/kingsbynumbers.aspx/

Kniola, D., Chang, M., & Olsen, D. (2012). Transformative graduate education programs: An analysis of impact on STEM and non-STEM Ph.D. completion. *Journal of Higher Education, 63*, 473–495. doi:10.1007/s10734-011-9453-8

Komarraju, M., Musulkin, S., & Bhattacharya, G. (2010). Role of student-faculty interactions in developing college students; academic self-concept, motivation, and achievement. *Journal of College Student Development, 51*(3), 332–342.

Kong, L. N., Qin, B., Zhou, Y. Q., Mou, S. Y., & Gao, H. M. (2014). The effectiveness of problem-based learning on development of nursing students' critical thinking: A systematic review and meta-analysis. *International Journal of Nursing Studies, 51*(1), 458–469.

Korpan, C. J. (2014). The apprenticeship of teaching assistants: Time to change? *Transformative Dialogues: Teaching & Learning Journal,* 7(3), 1–7.

Korpan, C., Sheffield, S. L. M., & Verwoord, R. (2015). Teaching assistant competencies in Canada: Building a framework for practice together. *Collected Essays on Learning and Teaching, 8*, 219–230.

Lechuga, V. M. (2011). Faculty-graduate student mentoring relationships: Mentors' perceived roles and responsibilities. *Journal of Higher Education, 62,* 757–771. doi:10.1007/s1073 4-011-9416-0

Lehrer, R., & Schauble, L. (2006). Scientific thinking and scientific literacy: Supporting development in learning contexts. In W. Damon & R. M. Lerner (Series Eds.), & K. A. Renninger & I. E. Sigel (Volume Eds.), *Handbook of child psychology* (Vol. 4, 6th ed., pp. 153–196). Hoboken, NJ: Wiley.

Lester, S., & Costley, C. (2010). Work-based learning at higher education level: Value, practice and critique. *Studies in Higher Education, 35,* 561–575. doi:10.1080/030750709032166 35

Linenberger, K., Slade, M. C., Addis, E. A., Elliott, E. R., Mynhardt, G., & Raker, J. R. (2014). Training the foot soldiers of inquiry: Development and evaluation of a graduate teaching assistant learning community. *Journal of College Science Teaching, 44*(1), 97–107.

Lopatto, D. (2010). Undergraduate research as a high-impact student experience. *Peer Review, 12*(2), 27–30.

Marbach-Ad, G., Schaefer, K. L., Kumi, B. C., Friedman, L. A., Thompson, K. V., & Doyle, M. P. (2012). Development and evaluation of a prep course for chemistry graduate teaching assistants at a research university. *Journal of Chemical Education, 89,* 865–872. doi:10.1 021/ed200563b

McGoldrick, K., Hoyt, G., & Colander, D. (2010). The professional development of graduate students for teaching activities: The students' perspective. *The Journal of Economic Education, 41*, 194–201. doi:10.1080/00220481003613862

McLaughlin, J. E., Roth, M. T., Glatt, D. M., Gharkholonarehe, N., Davidson, C. A., Griffin, L. M., & Mumper, R. J. (2014). The flipped classroom: A course redesign to foster learning and engagement in a health professions school. *Academic Medicine, 89*(2), 236–243.

Mena, I. B., Diefes-Dux, H. A., & Capobianco, B. M. (2013). Socialization experiences resulting from doctoral engineering teaching assistantships. *Journal of Higher Education, 84*(2), 189–212.

Mesmer-Magnus, J. R. (2014). 'Flipping' the college classroom. In D. Ashe & C. Clements (Eds.), *Best practices in university teaching: Essays by award-winning faculty at the University of North Carolina Wilmington* (2nd ed., pp. 173–182). Wilmington, NC: Center for Teaching Excellence.

National Survey of Student Engagement [NSSE]. (2015). *About NSSE*. Retrieved from http://nsse.indiana.edu/html/about.cfm

Nick, J. M., Delahoyde, T. M., Prato, D. D., Mitchell, C., Ortiz, J., Ottley, C., Siktberg, L. (2012). Best practices in academic mentoring: A model for excellence. *Nursing Research and Practice, 2012*(1), 1–9.

Park, C. (2004). The graduate teaching assistant (GTA): Lessons from North American experience. *Teaching in Higher Education*, *9*, 349–361. doi:10.1080/1356251042000216660

Pease, M. A., & Kuhn, D. (2010). Experimental analysis of effective components of problem-based learning. *Science Education, 95*(1), 57–86.

Pentecost, T. C., Langdon, L. S., Asirvatham, M., Robus, H., & Parson, R. (2012). Graduate teaching assistant training that fosters student-centered instruction and professional development. *Journal of College Science Teaching, 41*(6), 68–75.

Pfund, C., Pribbenow, C. M., Branchaw, J., Lauffer, S. M., & Handelsman, J. (2006). The merits of training mentors. *Science, 311*(5760), 473–474.

Pratasavitskaya, H., & Stensaker, B. (2010). Quality management in higher education: Towards a

better understanding of an emerging field. *Quality in Higher Education, 16(1),* 37–50, doi:10.1080/13538321003679465

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education, 93*, 223–231. doi:10.1002/j.2168-9830.2004.tb00809.x

Richards, K. A., Velasquez, J. D., & Payne, L. B. (2012). The influence of a college teaching workshop series on teaching assistant perceptions of preparedness and self-efficacy. *Proceedings of the ASEE Annual Conference* (Session 4433). Washington, DC: ASEE.

Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family & Consumer Sciences, 105*(2), 44–49.

Roehrig, G., Luft, J., Kurdziel, J., & Turner, J. (2003). Graduate teaching assistants and inquiry-based instruction: Implications for graduate teaching assistant training. *Journal of Chemical Education*, *80*(10), 1206–1210.

Ronfeldt, M., & Reininger, M. (2012). More or better student teaching? *Teaching and Teacher Education, 28*(6), 1091–1106.

Savery, J. R. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem-Based Learning*, *1*(1), 8–20.

Schmidt, H. G., Rotgans, J. I., & Yew, E. H. J. (2011). The process of problem-based learning: What works and why. *Medical Education, 45*(8), 792–806.

Shannon, D. M., Twale, D. J., & Moore, M. S. (1998). TA teaching effectiveness: The impact of training and teacher experience. *Journal of Higher Education, 69*(4), 440–466.

Stewart, D. W. (2013, December 10). Programs help prepare graduate students for a range of careers. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com/blogs/letters/programs-help-prepare-graduate-students-for-a-range-of-careers/

Tsui, A. S., & O'Reilly, C. A. (1989). Beyond simple demographic effects: The importance of relational demography in superior-subordinate dyads. *Academy of Management, 32*, 402–423. doi:10.2307/256368

University of Hong Kong. (2014, November). *Quick stats*. Retrieved from http://www.cpao.hku.hk/qstats/student-profiles/

University of North Carolina Wilmington (n.d.). *Enrollment demographics spring 2015*. Retrieved from http://www.uncw.edu/oira/documents/FactSheets/Enrollment-Demographics/enrollment_current_Fall2008.htm

University of Tennessee, Knoxville. (n.d.). *Quick facts*. Retrieved from http://www.utk.edu/aboutut/numbers/

Vanderbilt University. (n.d.). *The Vanderbilt profile*. Retrieved from http://admissions.vanderbilt.edu/profile/#enrollmentfall2012

Vanderbilt University's Center for Teaching (n.d.). *Graduate student offerings*. Retrieved from https://cft.vanderbilt.edu/docs/graduate-student-programs/

Venkatesh, V., Rabah, J., Lamoureux-Scholes, L., Pelczer, I., Urbaniak, K., & Martin, F. (2014). Development, implementation, and evaluation of a professional skills development program: The case of Concordia University's gradproskills. *Canadian Journal of Higher Education, 44*(3), 39–53.

Weeks, F., & Harbor, J. (2014). Assessing the impact of a K-12 engagement program on graduate learning outcomes for communicating with diverse audiences. *International Journal for the Scholarship of Teaching and Learning, 8*(2), 1–24.

Weidert, J. M., Wendorf, A. R., Gurung, R. A. R., & Filz, T. (2012). A survey of graduate and undergraduate teaching assistants. *College Teaching, 60,* 95–103. doi: 10.1080/8756755 5. 2011.637250

Wise, A. (2011). Supporting future faculty in developing their teaching practices: An exploration of communication networks among graduate teaching assistants. *International Journal of Teaching and Learning in Higher Education, 23*(2), 135–149.

Wurgler, E., VanHeuvelen, J. S., Rohrman, S., Loehr, A., & Grace, M. K. (2013). The perceived benefits of a preparing future faculty program and its effect on job satisfaction, confidence, and competence. *Teaching Sociology, 42*, 50–60. doi: 10.1177/0092055X135 07782

Contact Information

Michele A. Parker
Watson College of Education
The University of North Carolina at Wilmington
parkerma@uncw.edu

Michele Parker is an associate professor in the Department of Educational Leadership at the University of North Carolina Wilmington (UNCW). From 2014–2015, she served as the interim associate director for the Center for Teaching Excellence and Center for Faculty Leadership at UNCW. Michele earned her PhD in research, statistics, and evaluation at the University of Virginia. At UNCW, her responsibilities include teaching Introduction to Educational Research for master's level students and research and evaluation courses for the doctorate program in educational leadership. She co-developed the graduate certificate in college teaching at UNCW.

Diana Ashe is an associate professor in the Department of English and the director of the Center for Teaching Excellence and Center for Faculty Leadership at UNCW. She is the recipient of the 2011 Board of Trustees Award for Teaching Excellence, a 2011 Distinguished Teaching Professorship, and a 2010 Chancellor's Award for Teaching Excellence. She balances her work in faculty development with teaching courses in rhetoric and professional writing.

Jess Boersma is the director of ETEAL, UNCW's Applied Learning Program, and the director of the team for Interdisciplinary Global Research. He earned his BS from the University of Wisconsin at Madison and his PhD from Emory University. An associate professor in Spanish at UNCW, he is also the editor of two volumes on literature and society. He has been the principal investigator on several external grants including an Association of American Colleges and Universities grant on applied learning and US government grants concerning language, regional expertise, culture, and pedagogical development.

Robert Hicks serves as the social research assistant for UNCW's Applied Learning Program, conducting and managing research on applied learning at UNCW. Holding an MA in Criminology from UNCW with a background in both qualitative and quantitative research design, Robert is currently engaged in the monitoring, evaluation, and continuous improvement of UNCW's QEP. Other research interests include accessibility issues in higher education, victimology and conceptions of police role, and select topics in multimedia content analysis.

Victoria Bennett is in her second year of the psychology MA program at UNCW and works as a graduate research assistant for the Center for Teaching Excellence. Her master's thesis examines how different types of intimate partner violence perpetrators respond to perceived provocation by a partner. After earning her MA, Victoria plans to earn her PhD in clinical psychology.

Appendix

Institution-Wide Examples of Graduate Student Training in the Literature

University	# of Graduate Students	Length of TA Program	Information about TA Program	Applied Learning Component?	Author
King's College of London	10,600 (King's College London, 2015)	Two Years	The King's Learning Institute at King's College London offered a two-year program in which TAs took a number of courses. • Focused on three key features: teaching component, observation of teaching, and a final assessment via a teaching portfolio. • Program length was two years; in the first year students took six classes, four of which they selected from eight possible classes. In the second year, everyone took the same five classes. • Offered courses such as: small group teaching, introduction to e-learning and e-tutoring, and student learning in higher education. • Provided feedback following classroom observation (once in the first year and twice in the second year).	Yes, students' teaching was observed three times during the two-year program.	Chadha (2013)

University	# of Graduate Students	Length of TA Program	Information about TA Program	Applied Learning Component?	Author
University of Hong Kong	8,914 (University of Hong Kong, 2014)	Two Semesters	The training program at the University of Hong Kong was geared towards active learning, and based on interviews from 18 award-winning faculty. • Emphasized an issue-based approach: TAs identified classroom problems and the program leaders offered strategies to help address such issues. • Program length was two semesters. • Focused on topics such as, disengaged students, role-playing and student–teacher interactions. • Evaluated TAs using a group project, in which TAs taught about a specific teaching technique via active participation and role play. Feedback was provided continuously throughout the two semesters following role play.	Yes, the group project was not permitted to be a lecture.	Kember (2009)

University	# of Graduate Students	Length of TA Program	Information about TA Program	Applied Learning Component?	Author
Carnegie Mellon University	6,918 (Carnegie Mellon University, n.d.)	Continuous	The Eberly Center for Teaching Excellence at Carnegie Mellon University continuously offered a number of services and resources for all graduate students to enhance their teaching skills. • Offered multiple workshops, seminars, consultation, resources, and a future faculty program each semester • Seminars generally lasted 2 hours • Included topics such as incorporating technology into the classroom and addressing disruptive classroom behavior. • Provided feedback on teaching through one-on-one meetings, classroom observation, focus groups, and microteaching workshops.	Yes, teaching was observed with the provision of feedback. Workshops could also have applied learning components.	Carnegie Mellon (n.d.)

University	# of Graduate Students	Length of TA Program	Information about TA Program	Applied Learning Component?	Author
University of Tennessee, Knoxville	5,982 (University of Tennessee, Knoxville, n.d.)	Continuous	Jan Allen and Schuyler Huck developed the University of Tennessee, Knoxville's Graduate Teaching Assistant Mentoring Program, which was designed to emphasize teaching and provide TAs with the tools necessary to be outstanding teachers. • Comprised of large, university-wide workshops and small discussion groups consisting of 5–7 TAs and a faculty advisor with an outstanding teaching award. • Small groups met either weekly or biweekly, depending on the group. • University-wide workshops were offered throughout the semester. • Included topics such as: strengthening teaching skills, professional development, student problems (e.g., plagiarism). • Provided feedback following observation of teaching.	Yes, practices gleaned from university-wide workshops were implemented.	Gaia et al. (2003)

University	# of Graduate Students	Length of TA Program	Information about TA Program	Applied Learning Component?	Author
Vanderbilt University	5,684 (Vanderbilt University, n.d.)	Continuous	The Center for Teaching at Vanderbilt University continuously offered a number of workshops, services, and programs, such as the Graduate Teaching Fellows program. Additionally, the Center for Teaching hosted the all-day TA orientation each August. • Graduate teaching assistants were given mentors from the Graduate teaching fellows program. Graduate teaching fellows program hired students who desire a career in academia and helped them develop their teaching skills. • Workshops generally lasted an hour and a half. • Included workshop topics such as: inclusive teaching, crafting effective teaching statements, and improvisation for the millennial learner. • Provided feedback to TAs via small group analysis, observation of teaching, and video consultation.	Yes, graduate teaching fellows consulted with other graduate students in the design and facilitation of workshops.	Vanderbilt University's Center for Teaching (n.d.)

University	# of Graduate Students	Length of TA Program	Information about TA Program	Applied Learning Component?	Author
City University of Hong Kong	5,224 (City University of Hong Kong, 2015)	Ten Months	The TA training course at the City University of Hong Kong emphasized microteaching. • Focused on two cycles. The first consisted of information briefing, teaching observation, and feedback. The second cycle was comprised of training, teaching observation, and feedback. • Course was taught at the end of the summer semester through the end of June. • Included topics such as: active learning strategies, course development, and professional development skills. • Provided feedback continuously using recordings of TAs that were posted online for feedback from other TAs and faculty members.	Yes, teaching was recorded and multiple sources of feedback were provided.	Calonge et al. (2013)