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Assessing Graduate Teaching Development Programs for Impact on Future Faculty

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1. Executive Summary

1.1 Context

Teaching assistants (TAs) make an important contribution to undergraduate education at Ontario universities. The majority of teaching assistants begin their assignment with little or no previous teaching experience. In order to help TAs prepare for their role in the classroom, universities offer teaching development programs that vary greatly in length, intensity and content. While there is a growing body of research showing that teaching development programs have a positive impact on the teaching effectiveness of new TAs, little is known about the variation in the impact of different types of TA programs on the teaching practice of new instructors. Additionally, the call for increased development is occurring in a period of limited financial resources. The Centre for Teaching and Learning at the University of Windsor and the Teaching Support Centre at Western University offer a wide range of teaching assistant training programs. Both universities organize short, orientation-style conferences for TAs in the early fall, as well as longer, intensive workshops throughout the year.

1.2 Research Question

The goals of this study were to assess and compare the impact of several TA development programs at Western University and the University of Windsor, and to link specific types of programming to measurable outcomes. We wanted to compare the impact of programs of varying duration and examine how teaching assistants apply what they learn in short and long programs when they teach in their disciplines. In pursuing these goals, our research questions were as follows:

- ***Research Question 1.*** *How does participation in teaching development programs impact teaching assistants' (1) approaches to teaching, (2) teaching self-efficacy, and (3) teaching practice?*
- ***Research Question 2.*** *How does the impact of participation in short orientation-style programs differ from the impact of participation in longer, more intensive teaching development programs?*

1.3 Methods

The study employed a multi-method design, involving self-reported measures of participants' attitudes to teaching (Trigwell, Prosser & Ginns, 2005) and teaching self-efficacy (Boman, 2008) before and after each program, combined with focus group interviews four months after program completion. Focus group interviews explored long-term changes in participants' approach to teaching, teaching self-efficacy and teaching practice.

1.4 Summary of Findings

The findings provide evidence that teaching development programs help improve the teaching effectiveness of new teaching assistants in a variety of ways. TAs felt better prepared for their role as instructors after participating in training. Both short and long programs contributed to increased teaching self-efficacy and to an increase in student-focused approaches to teaching. Based on the examples described in the focus groups, we found that when TAs began to teach on their own, they were able to apply the teaching techniques, course design principles and student-focused approaches to teaching that they learn in TA training programs.

When describing what they learned in the program during focus group interviews, short program (one-day events) participants emphasized concrete teaching techniques for facilitating discussions, marking, asking effective questions and becoming more familiar with expectations for the teaching assistant role. Participants in longer programs demonstrated greater confidence in using principles of course design and alignment, articulating learning outcomes and demonstrated a greater depth of reflection on teaching.

The impact of long programs (20 to 40 hours) on teaching and learning went beyond the teaching practices of participants. Long programs created communities of TAs from a variety of disciplines, in which dialogue about teaching continued beyond the end of the program. They inspired teaching innovation beyond the course, when participants returned to their departments and shared innovative teaching techniques or course design strategies with their peers and with faculty members. Long programs also made a substantial contribution to the preparation of future faculty, as many of the participants chose to engage in teaching development as strategic preparation for an academic career.

2. Background

Graduate and undergraduate teaching assistants (TAs) make a significant contribution to undergraduate learning at Ontario universities. TAs facilitate tutorials in the social sciences, support learning in science and engineering labs, and teach their own sections of language and literature courses in many disciplines in the arts and humanities. TAs have an important role in assessing student learning, since marking exams, essays and lab reports is often a central component of their duties. TAs are often the first point of contact for undergraduate students in office hours, where they answer questions, give feedback on student progress and provide direction to students as they choose essay and project topics. The teaching effectiveness of TAs influences the quality of undergraduate experience in many ways. TAs have the potential to inspire and engage future scholars in their discipline, articulate the real-world applications of theory in tutorials and promote inquiry-based learning in labs. Despite the importance of their role, the majority of TAs begin their assignment with little or no teaching experience or training at the university level.

The vast majority of teaching assistants at Ontario universities are graduate students who teach while pursuing a master's or doctoral degree. At some Ontario institutions[1], however, senior undergraduates also work as teaching assistants. At the University of Windsor, "graduate assistant" (GA) refers to a graduate student instructor, while "teaching assistant" (TA) refers to an undergraduate student instructor. At Western, "TA" refers to graduate student instructors only, because no undergraduates work as teaching assistants. For the purposes of the paper, we will use the term "teaching assistant" (TA) to include both graduate and undergraduate student instructors, and "teaching assistant programs" to refer to teaching development programs for all student instructors.

Over the past ten years, there has been a growing call for the development of teaching skills for teaching assistants. The need for TA training has been raised by educational developers and educational policy makers across Canada and in the United States (Palmer, 2011; Shannon, Twale & Moore, 1998; Austin & Wulff, 2004; Golde & Dore, 2001; CAGS, 2008). In Ontario, a recent Ontario University Students' Association (OUSA) policy report on student success stressed the need for teaching assistant training and to provide more support for new faculty as they prepare for their teaching roles at Canadian universities (Martin & Guinlock, 2010). In response to the growing need for training, teaching and learning centres across Ontario have developed and expanded programs at their institutions to prepare teaching assistants for their roles in the classroom. Yet universities are in a period of financial pressure, so the choice of which programs to fund to achieve the greatest impact is critical.

TA training programs at Canadian universities vary widely, from single workshops to longer, systematic programs such as teaching certificates or extended courses that allow TAs to engage with course design, gain hands on teaching practice, receive mentorship or participate in TA learning communities (Korpan, 2011; Border & Hoene, 2010). While there is great variation in length and design, most institutions create teaching assistant development programs with two goals in mind: (1) to enhance the quality of undergraduate education by introducing new TAs to principles of effective teaching, and (2) to contribute to the development of future faculty by promoting student-centered teaching approaches among graduate students who will go on to academic careers (Britnell et al., 2010; Smith, 2001). In order to explore the types of training that will contribute most to the quality of higher education in Ontario, we draw on research about the outcomes of both TA and faculty development programs because these programs are part of a similar teaching development continuum.

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[1] At the University of Windsor and Brock University, for example.

The results of a recent HEQCO project (Britnell et al., 2010) indicate that the effects of professional development programs are already being felt in academic institutions, as more and more newly hired faculty report having had some form of pedagogical training while pursuing their graduate degree. While increasing numbers of faculty report having engaged in such programs as graduate students, the concrete impacts of specific interventions on teaching behaviours, perceptions of instructor self-efficacy and student learning are not well documented.

Another variable that has not been investigated comprehensively is the effect of program duration. Some evidence suggests that longer programs result in greater change in perceptions, attitudes and behaviour related to effective teaching among new teaching assistants (Gibbs & Coffey, 2004; Shannon, Twale & Moore, 1998), but we know little about how the impact of short and long programs differ, and to what extent TAs are able to use the knowledge they gain in each program type when they work with undergraduate students.

In this research, we seek to assess the impact of select short and long programs designed to enhance the instructional skills of teaching assistants and prepare them for future academic practice in Ontario and beyond. The assessment of specific skills gained through participation in a selection of teaching-related programs at Western and Windsor will be used to develop general recommendations for the creation or refinement of graduate student development programs. These concrete insights will be transferable to other graduate degree-granting institutions across the province seeking to revise, enhance or establish programs for the preparation of future faculty.

2.1 Research on the Outcomes of Teaching Development Programs

Instructional skills development programs for graduate students tend to fall into two main categories. Shorter, orientation-type TA training programs often take a behavioural approach and focus on providing new instructors with concrete teaching skills that help them resolve immediate classroom problems (Boyd, 1989), prepare them for effective classroom management and provide basic tools for lecturing and marking (Schönwetter, Ellis, Taylor & Koop, 2008). Longer programs and programs designed for TAs with some previous teaching experience tend to shift from an emphasis on changing teaching behaviours towards developing reflective practice and changing teachers' "conceptions of teaching" by encouraging a transition from a teacher-focused to a student-focused approach (Trigwell & Prosser, 1996; Shannon, Twale & Moore, 1998). Teachers who engage in critical reflection on their teaching are believed to increase student learning (Biggs & Tang, 2007; McAlpine & Weston, 2000; Nolan & Huber, 1989; Potter & Kustra, 2012). The category of longer programs includes extended certificate programs such as those offered at the University of Windsor, Waterloo, Western and Manitoba (Taylor, Schönwetter, Ellis & Roberts, 2008) and at a number of large U.S. research universities (Robinson, 2011).

Previous research on the impact of training for TAs and novice instructors identified a variety of positive outcomes. Evidence suggests that training can improve instructor confidence (Salinas, Kozuh & Seraphine, 1999), increase instructor self-efficacy (Dawson, Dimitrov, Meadows & Olsen, 2013; Boman, 2008; Komarraju, 2008), decrease anxiety and speech anxiety (Dawson et al., 2013; Williams, 1991), and increase the frequency of effective teaching behaviours (LeGros, 2010; Boman, 2013; D'Eon, 2004). Common outcomes of TA training programs also include knowledge of and ability to use teaching techniques (lecturing, discussion, group work), assessment and feedback, use of technology, classroom management, and course and curriculum planning (Taylor, Schnöwetter, Ellis & Roberts, 2008).

The impact of teaching development programs, however, is influenced by many variables. Prior teaching experience, for example, influences the way programs may impact participants' self-efficacy. Postareff et al. (2008) suggest that "pedagogical training is more likely to strengthen the self-efficacy beliefs of teachers who have less teaching experience than those who have more teaching experience" (p. 43). Program length is another intervening variable – longer, extended programs tend to have more positive outcomes than one-time interventions (McAlpine, 2003, cited in Stes, Min-Leliveld, Gijbels & Van Petegem, 2010; Steinert et al., 2006; Chism, Holley & Harris, 2012). Postareff (2007) suggests that approaches to teaching change slowly and are more likely to be measurable after two- to three-semester-long programs.

At the same time, the study of a one-day, intensive workshop for clinical instructors by Notzer and Abramovitz (2008) found significant impact among 149 instructors based on student ratings one year after the intervention. The brief workshop included some of the features of advanced (i.e., not orientation-like) training programs by its reliance on microteaching (simulated instructional scenarios) and its focus on student-centered and self-directed learning. The study found significant changes in teachers' overall effectiveness as well as in a variety of specific ratings such as "tutor availability to students" and "contribution to clinical training."

3. Research Questions and Assessment Plan

Given the diversity of findings in the existing literature, we wanted to explore the differential impact of short and long TA development programs at our institutions and understand how TAs apply what they learn in these programs when they return to teach in their home departments. The study's main research questions are the following:

- *Research Question 1.* How does participation in teaching development programs impact teaching assistants' (1) approaches to teaching, (2) teaching self-efficacy and (3) teaching practice?
- *Research Question 2.* How does the impact of participation in short, orientation-style programs differ from the impact of participation in longer, more intensive teaching development programs?

In assessing the impact of programs, we chose to focus on changes in teaching assistants' *approaches to teaching* (Trigwell, Prosser & Ginns, 2005) and *teaching self-efficacy* (Boman, 2008). Changes in teachers' approaches to teaching as measured by the revised *Approaches to Teaching Inventory* (ATI-R; Trigwell, Prosser & Ginns, 2005) were used in the study because these changes may provide insight into an important stage in teacher development. The ATI-R captures the transition from an information transfer/teacher-focused approach to teaching to a conceptual change/student-focused approach to teaching and learning that is central to teacher development. Conceptual change/student-focused approaches to learning have been associated with deep learning as opposed to surface learning among students (Gibbs & Coffey, 2004) as well as with higher student ratings of teaching. The ATI-R is one of the most widely used and validated scales available in the literature (Hanbury et al., 2008; Cassidy & Ahmad, forthcoming; Prosser & Trigwell, 2006; Meyer & Eley, 2006).

In addition, we wanted to examine changes in participants' teaching self-efficacy. Teaching self-efficacy is the belief that one can successfully master the teaching behaviours necessary to achieve a variety of learning and teaching outcomes (Prieto & Meyers, 1999). Teachers with high self-efficacy have been shown to use effective teacher behaviours more frequently than teachers with low self-efficacy (Gordon & Debus, 2002; Boman, 2008). Longer periods of training have been found to lead to greater increases in teacher self-efficacy than shorter training periods (Postareff, Lindblom-Ylänne & Nevgi, 2007).

In the design of the research, we draw on the approaches used in several multi-method studies on the impact of teaching development programs. These studies have addressed the methodological limitations of the previous literature and have pilot tested both quantitative and qualitative measures of program impact. Stes et al. (2010) provide a review of the methodological approaches used by 36 studies on the outcomes of instructional development programs for both faculty and graduate student instructors. Among these, we draw on the design of the following studies:

The use of the *Approaches to Teaching Inventory* (Trigwell, Prosser & Ginns, 2005*)* as the main instrument for measuring change in teaching approach was informed by longitudinal research by Stes (2008) on the impact of faculty development programs in the Netherlands. Stes's study relied on a multi-method design, using pre- and post-assessments of participant approaches to teaching measured by the ATI-R. A demographically similar group of faculty (identified by study participants) was used as a control group. In another study using the ATI-R, Gibbs and Coffey (2004) were able to demonstrate significant changes in instructors' approach to teaching, as rated by students, as much as one year after training. Postareff, Lindblom-Ylänne and Nevgi (2008) combined the ATI-R with a short self-efficacy measure in a longitudinal study of faculty members who took part in varying forms of pedagogical training. Their research suggests that new instructors' self-efficacy may initially decrease after a brief period of training as they become aware of teaching issues, but that it increases a year after the training and exceeds the self-efficacy of instructors who did not take part in training.

In addition to the quantitative results, qualitative data were also collected to provide a richer description of how TAs use what they learn in teaching development programs. This approach has been utilized in several other similar studies. A combination of the ATI-R, focus group discussions and interviews was used in a study by Hanbury et al. (2008) across 32 U.K. higher education institutions in order to evaluate long teaching programs (one to two years). Results demonstrated a higher student-focused approach after the program. Focus groups supported these findings and suggested that the programs have a positive impact on their confidence in teaching and their practices. In the Canadian context, Taylor, Schönwetter, Ellis and Roberts (2008) conducted a mixed method study assessing the effectiveness of two certificate programs for graduate students at the University of Manitoba and the University of Waterloo. The study showed significant changes among program participants on a number of factors from Time 1 to Time 2, including changes in participant preparedness to teach, importance of teaching and knowledge of conceptual issues related to teaching. We drew on the themes and areas of improvement identified in this study and further explored them both in the focus groups and on the Time 1 and 2 surveys.

We adopted the self-efficacy measure from a study conducted on Western University's Teaching Assistant Training Program in 2006-2008 (Boman, 2008; Boman, 2013). The study assessed the outcomes of a 20-hour intensive TA training course using both self- and observer-rated measures of change. Results indicated that graduate students made significant gains in self-efficacy, pedagogical knowledge and observer-rated teaching effectiveness. They also experienced a reduction in public speaking apprehension between Time 1 and Time 2 measures even though the elapsed time was only two days. The TA self-efficacy measure was most recently used in a study on the outcomes of Western's TA and ITA training programs (Dawson et al., 2013). This latest study combined self-report measures of self-efficacy and communication apprehension with observer ratings of effective teacher behaviours to demonstrate that TA training programs help to increase the teaching self-efficacy of both Canadian and international TAs, decrease their communication apprehension and increase the frequency of effective teacher behaviours. Survey data were combined with focus group interviews in order to obtain rich examples of how TAs apply newly learned teaching approaches in their classrooms. Similar focus group questions were used in the current study to explore the application of knowledge among short and long program participants.

4. Description of Programs Assessed

4.1 Western University

Western University's Teaching Support Centre has offered TA training programs for over 20 years. There are 5,000 students in Western's graduate student body. International graduate students make up approximately 26% of the doctoral students and 18% of the master's students on campus. During the study period, 40% (just over 2,000) of the 5,000 graduate students held a teaching assistantship on campus. The 2,000 TAs were distributed relatively evenly among the faculties: 377 in social sciences, 412 in arts and humanities, 676 in the biological sciences, and 548 in the physical sciences and engineering. Each year during the study period, over 3,000 registrants (1,200 individuals participating in multiple programs) took part in graduate development programs offered through the Teaching Support Centre. TA development programs allow graduate students to practice presentation and group facilitation skills while developing other instructional competencies including student-centered course design and authentic assessment of learning. The majority of programs assessed in the study are well established. TA Day has been offered for over 20 years, while the Winter Conference on Teaching and Advanced Teaching Program (ATP) were developed six to eight years ago. In addition to the descriptions below, Appendix A provides additional details on each program.

4.1.1 Short Workshops (one-day events)

The Graduate Student Conference on Teaching (TA Day) is a one-day event for new teaching assistants at Western. During the day, TAs attend a keynote speech by an award-winning professor (specific topics vary but the broad focus is on effective teaching) and then choose three out of nine concurrent sessions on a variety of teaching approaches. Concurrent sessions are 60 minutes long and focus on leading effective discussions, leading science labs/demonstrations, teaching first-year undergraduate students, interpersonal communication, ethics and fairness in teaching, dealing with difficult students/classroom management, starting a teaching dossier, incorporating information literacy into teaching (collaboration with librarians), and time management strategies. The objectives of the day are to (1) introduce new TAs to a few effective teaching techniques, (2) communicate the value of teaching and inspire teaching excellence, (3) increase TAs teaching self-efficacy, and (4) encourage graduate students to participate in further teaching development.

The Winter Conference on Teaching is a one-day event held in mid-January for TAs entering the second term of the year and involves three workshops. The specific topics of the first and second sessions vary from year to year but usually focus on concepts in teaching and learning, effective teaching strategies and academic survival skills for graduate students. Past topics included threshold concepts, effective use of technology, teaching critical thinking, and ethics for TAs. The final session of the day involves a panel presentation in which winners of the "Great Ideas for Teaching" contest (usually advanced TAs) present innovative teaching ideas. The contest invites teaching assistants to submit the description and rationale of an original learning activity that they have designed and used in their lab, tutorial or class. The winners usually represent a variety of disciplines and are selected based on the creativity and usefulness of their proposed teaching activity, assignment or strategy. The dataset from the Winter Conference was smaller than the TA day dataset, so it was included in some but not all of the analyses in the study.

4.1.2 Long Programs (20 to 40 hours)

The **Advanced Teaching Program (ATP)** at Western addresses the needs of experienced graduate students interested in transitioning into the role of independent instructors. Successful completion of ATP requires: 1)

attendance at a 20-hour workshop (five, four-hour sessions over five weeks) that highlights the development of learning outcomes, establishment and maintenance of classroom civility, and implementation of active learning techniques, 2) participation in two traditional microteaching sessions and one role-playing session based on challenging classroom situations (video-recorded, with small group feedback), and 3) preparation of a ninety-minute seminar about discipline-specific teaching innovations or research.

Graduate Studies 9500 (GS9500) Theory and Practice of University Teaching is a 40-hour graduate course offered once a year at Western. The goals of the course are to introduce advanced graduate students to the principles of university teaching, course design and assessment. The course includes three video-recorded microteaching sessions (ten minutes each) during which participants receive feedback on their teaching and give feedback to peers. Participants also gain experience designing and co-facilitating a thirty-minute learning activity in one of the class sessions. Course topics include learning and motivation, globalization of learning, forms and functions of assessment, curriculum theory, service learning, course design, student diversity and learning styles, learning and technology, and others. During the course, participants write and revise a teaching philosophy statement. The final assignment requires participants to create a new course in their discipline and to describe the rationale for their choice of learning activities and assessments.

4.2 University of Windsor

The University of Windsor has a relatively new teaching development unit within the Centre for Teaching and Learning, and all graduate assistant (GA) and teaching assistant (TA) teaching development programs were initiated between 2008 and 2011. Windsor has a graduate student body of approximately 2,000 students, 39% of whom are international students (of those, approximately 86% are master's students and 14% are PhD). The goal of the GA/TA Teaching Development Program is to develop teaching skills, knowledge and attitudes that will result in more effective teaching and learning. The GA/TA Program includes an orientation (full-day), half-courses (18 hours), graduate credit courses (normally 36 hours), a learning community (GATA Network is an volunteer community that provides distributed support and also offers workshops throughout the year), and the opportunity to engage in classroom observations, in addition to access to consultations. In 2012, there were 967 student registrations in events, made by 339 unique individuals – approximately 17% of the graduate student body.

4.2.1 Short Programs (one-day events)

GATAcademy is a one-day orientation with short workshops for current and prospective graduate and undergraduate teaching assistants. This one-day event focuses on developing the teaching skills required for teaching across disciplines. These interactive sessions are led by experienced teaching assistants, faculty and staff members and focus on topics such as: providing feedback, lecturing, leading discussions, conducting labs and tutorials, and grading and using technology in teaching. GATAcademy is usually offered the day before the start of classes during the fall semester.

4.2.2 Long Programs (18 to 25 hours)

Long programs include graduate credit courses (two courses, 36 hours each) that introduce concepts, trends and effective practices in university teaching and learning. These full-credit courses are titled, "Learning-Centered Teaching in Higher Education: Principles and Practices" and "Course Design for Constructive Alignment." Long programs also include half-courses (18 hours each) that explore a particular teaching method or style over a period of six weeks. Half-courses include "Leading Effective Discussions", "Lecturing", "Online Education" and "Authentic Assessment."

5. Method

5.1 Participants

5.1.1 Western Participants

Students enrolled in the following programs were invited to participate in the study: TA Day (September 2011 and 2012), Winter Conference on Teaching (Winter 2012), ATP (Fall 2011, Winter 2012, Summer 2012, Fall 2012), and GS9500 (Winter 2012, Fall 2012). Control group participants were invited to participate during the graduate student orientation prior to TA Day. Participants in the control group did not attend any educational development programs.

Students in the TA Day program and control group were invited by e-mail to participate in an online version of the pre-program (Time 1) survey the night before TA Day, and the post-program (Time 2) survey the next day. Paper copies of the Time 1 survey were also distributed on the morning of TA Day and the Time 2 survey at the end of the day.[2] For the other programs, paper copies of the Time 1 and 2 surveys were distributed at the beginning and end of the programs respectively.

Survey participants at both Western and Windsor were offered the opportunity to join a draw for a $100 gift certificate for participating in the survey, and they were offered individual gift certificates and food for participating in the focus groups.

The number of participants and response rates for the short program, long program and control group sessions are provided in Table 1. As can be seen in the Data Analyzed section in Table 1, there was a

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[2] A series of t-tests were performed to compare the TASE and ATI-R subscale scores of participants who completed the online and paper versions of the survey. No significant differences were found, so the online and paper survey data were merged for all subsequent analyses.

substantially larger number of participants from the short program (TA Day) sessions with matched Time 1 and 2 surveys than from the long programs. This is not surprising given that the two TA Day sessions had 687 registrants whereas the long programs had a total of 111 registrants over the six sessions. Unfortunately, this discrepancy in the number of matched participants, as well as the small number of matched participants for the long programs, posed analysis issues (addressed in the Results, Section 6.0). The data from the Winter Conference participants, which could have been used for subsequent analyses, were not used because more participants from a short program were deemed unnecessary given the large number of matched participants from TA Day. Also, there were only nine participants in the control group who had matched pre- and post-program data, which was too small a sample to use in subsequent analyses.

Table 1: Number of Participants and Response Rates in Each Data Collection Category – Western

	Program	Time 1 Survey	Time 2 Survey
Data Collected[1]			
	Short Programs		
	TA Day	498 (72%)	122 (18%)
	Winter Conference	41 (34%)	23 (21%)
	Long Programs		
	ATP	48 (71%)	28 (41%)
	GS9500	19 (44%)	14 (33%)
	Control[2]	26	26
	Total	630	171
Data Analyzed[3]			
	Short Programs		
	TA Day	109	109
	Long Programs		
	ATP	21	21
	GS9500	7	7
	Total	137	137

Note. [1]The numbers reported in a column in the Data Collected section are the number of participants who completed the survey and the percentage of the total number of possible participants this number represents (e.g., 498/687 = 72%). [2]The participation rate for the control group is not reported because the total number of possible participants is not known (i.e., the number of participants who attended the Graduate Student Orientation but not TA Day). [3]Only the data of those participants who completed both the Time 1 and 2 surveys were analyzed (i.e., those participants who completed either the Time 1 or the Time 2 survey but not both were dropped from the substantive analyses).

Key demographic characteristics are outlined in Table 2. It is important to note that the long program participants generally were older, more advanced in their studies, more evenly distributed across faculties, have more terms as a TA, and more likely to have taught undergraduates than their short program counterparts. As indicated in the description of the programs, these differences reflect the design of the programs. The short program, TA Day, is intended to address important issues for new TAs (e.g., "The First Day of Class" presentation) whereas the long programs, ATP and GS9500, delve more deeply into issues of teaching and learning (e.g., the purpose of a university) that are likely to be appealing to more experienced graduate students.

Table 2: Demographic Characteristics of Survey Participants in Percent – Western[1]

		Short Program	Long Program
Age[2]		25.64 (6.27)	28.39 (6.25)
Gender (%)	Female	62.3	64.3
	Male	37.7	35.7
Program Year	Master's 1	71.8	7.4
	Master's 2	5.8	18.5
	PhD 1	20.4	14.8
	PhD 2	1.9	11.1
	PhD 3	0.0	25.9
	PhD 4	0.0	22.2
Faculty	Arts & Humanities	26.7	10.7
	Dom Wright Faculty of Music	1.0	3.6
	Education	1.0	3.6
	Engineering	4.8	10.7
	Health Sciences	6.7	14.3
	Information & Media Studies	1.0	0.0
	Richard Ivey School of Business	0.0	3.6
	Schulich School of Medicine & Dentistry	5.7	10.7
	Science	29.5	17.9
	Social Science	23.8	25.0
Terms as a TA	0	73.1	15.4
	1-2	11.5	15.4
	3-4	11.5	15.4
	5-6	3.8	11.5
	7+	0.0	42.3
Training as a Teacher	Yes	14.4	17.9
	No	85.6	82.1
Taught Undergraduates	Yes	21.2	53.6
	No	78.8	46.4

Note: [1]Number of participants = 105 and 28 for the short and long programs, respectively;
[2]Indicates mean and standard deviation provided rather than percentage.

5.1.2. Windsor Participants

All graduate students and all third- and fourth-year undergraduates at Windsor were invited to participate in the study through an e-mail sent by a research assistant. Invitations were sent prior to the beginning of any graduate programming to participate in the Time 1 survey online, followed up by an e-mail to participate in the Time 2 survey online. In 2012, paper copies of the survey were made available in an attempt to increase response rates. Students enrolled in the following programs were specifically invited to participate in the study: GATAcademy (September 2011 and 2012), half-courses, and the two graduate credit courses, Learning-Centred Teaching in Higher Education and Course Design for Constructive Alignment. Control group participants were those who did not take part in any graduate development programs offered.

The number of participants and response rates for the Windsor short program, long program and control group sessions are provided in Table 3, and the demographic information is summarized in Table 4. Similar to Western, there were substantially more participants in the short program than in the long program. GATAcademy, the one-day short program, had approximately 170 participants in 2011 and 270 in 2012 (440 total including both undergraduate and graduate TAs), while the longer programs had caps on participation numbers, usually between 10 and 20 depending on the course. The long programs were open to graduate students as well as faculty and sessional instructors, for a total of approximately 200 participants in two years, of whom 84 were graduate students. As the Data Analyzed section in Table 3 shows, there were substantially fewer participants included in the analysis as only the data from graduate students were included. Additionally, the number of participants who completed both Time 1 and Time 2 surveys was not large enough to allow a matched comparison. Unfortunately, the discrepancy in the number of matched participants, as well as the small number of participants for the long programs, posed analysis issues, which are addressed in the Results section (Section 6.0).

Table 3: Number of Participants and Response Rates in Each Data Collection Category – Windsor

	Program	Time 1 Survey	Time 2 Survey
Data Collected[1]			
	Short Programs	63 (14%)	77 (18%)
	Long Programs	21 (25%)	26 (31%)
	Control	107	74
	Total	191	177
Data Analyzed[2]			
	Short Programs	59	70
	Long Programs	18	19
	Control	87	49
	Total	164	138

Note. [1]The numbers reported in a column in the Data Collected section are the number of participants who completed the survey and the percentage of the total number of possible participants this number represents (e.g., 63/440= 14%). [2]65 of the teaching assistants surveyed were third- or fourth-year undergraduate students. These participants were excluded from all subsequent analyses.

Table 4: Demographic Characteristics of Participants in the Short and Long Programs and the Control Group, by Time, in Percent – Windsor

	Short[1]		Long[2]		Control[3]	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Age[4]	27.1 (4.8)	28.2 (7.3)	26.6 (5.7)	35.6 (11.3)	26.9 (6.6)	27.6 (6.1)
Gender (%)						
Female	67.8	64.3	66.7	68.4	54.0	42.9
Male	30.5	34.3	33.3	26.3	46.0	57.1
Transgender	1.7	1.4	0.0	5.3	0.0	0.0
Program Year						
Master's 1	25.4	45.7	61.1	31.6	55.2	44.9
Master's 2	30.5	24.3	11.1	21.1	28.7	26.5
PhD 1	13.6	11.4	11.1	10.5	6.9	4.1
PhD 2	11.9	4.3	5.6	5.3	1.1	8.2
PhD 3	6.8	7.1	11.1	10.5	4.6	4.1
PhD 4	11.9	7.1	0.0	21.1	3.4	12.2
Faculty						
Arts & Social Science	42.4	31.9	16.7	47.4	39.1	21.3
Education	5.1	10.1	16.7	5.3	6.9	17.0
Engineering	32.2	21.7	27.8	10.5	26.4	25.5
Human Kinetics	3.4	7.2	5.6	0.0	6.9	2.1
Nursing	0.0	2.9	11.1	5.3	1.1	4.3
Business	1.7	5.8	11.1	5.3	1.1	10.6
Science	15.3	20.3	11.1	26.3	18.4	19.1
Terms as a TA						
0	20.3	28.6	50.0	31.6	48.8	43.8
1-2	23.7	35.7	22.2	31.6	27.9	29.2
3-4	25.4	15.7	5.6	21.1	11.6	8.3
5-6	13.6	10.0	11.1	5.3	3.5	4.2
7	16.9	10.0	11.1	10.5	8.1	14.6
Training as a Teacher						
Yes	23.7	7.1	33.3	10.5	14.9	6.1

Taught Undergraduates						
Yes	40.7	34.8	38.9	26.3	22.4	20.4
No	59.3	65.2	61.1	73.7	77.6	79.6

Note: [1]n's = 59 and 70 for Times 1 and 2, respectively. [2]n's = 18 and 19 for Times 1 and 2, respectively. [3]n's = 87 and 49 for Times 1 and 2, respectively. [4]Indicates mean and standard deviation provided rather than percentages.

5.2 Instruments

All versions of the survey included items assessing demographic characteristics and previous teaching experiences, as well as the *Teaching Assistant Self-Efficacy Scale* (TASE; Boman, 2008) and the *Approaches to Teaching Inventory Revised* (ATI-R; Trigwell, Prosser & Ginns, 2005). The Time 2 surveys also included an item asking if survey participants would be willing to participate in a follow-up focus group.

5.2.1 Demographic Information

Information about the participants' age, gender, degree and year, program, previous teaching experience, country of origin and other demographic information was collected using a short questionnaire (see Appendix B for these items).

5.2.2 Approaches to Teaching Inventory

To investigate possible changes in program participants' teacher-focused and student-focused approaches to teaching, they completed the revised *Approaches to Teaching Inventory* (ATI-R; Trigwell, Prosser & Ginns, 2005). The ATI-R is a 22-item standardized measure comprised of two scales: the Information Transfer/Teacher-Focused scale (ITTF; e.g., "In this subject, students should focus their study on what I provide them") and the Conceptual Change/Student-Focused scale (CCSF; e.g., "I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject").

Respondents rate the items on a five-point scale (i.e., 1 = *This item was **only rarely** true for me in this subject* to 5 = *This item was almost **always** true for me in this subject*), thinking of a typical course that they teach. A high mean score on the ITTF scale indicates that the respondent perceives her/his role as a teacher to transmit discipline-relevant information to her/his students. A high mean score on the CCSF scale reflects the respondent's focus on changing students' ways of thinking about the subject and recognizes the active role that students play in constructing their own knowledge. Trigwell, Prosser and Waterhouse (1999) have demonstrated that an ITTF approach to teaching corresponds with surface approaches to learning whereas the CCSF approach is associated with a deep approach to learning. The reliability and validity of the ATI-R have been supported in a number of studies (e.g., Prosser & Trigwell, 2006; Trigwell & Prosser, 2004; cf. Meyer & Eley, 2006), and a variety of studies on the impact of faculty development efforts have employed the ATI-R to document shifts in teaching approaches (Gibbs & Coffey, 2004; Light, Calkins, Luna & Drane, 2009; Postareff, Lindblom-Ylänne & Nevgi, 2007; Stes, Coertjens & Petegem, 2009). In this study, the ATI-R subscales demonstrated good internal consistency, a form of reliability (i.e., items designed to measure the same construct, such as a teacher-focused approach to teaching, were highly correlated). Specifically, the Cronbach's alphas for the Western and Windsor ATI-R subscales ranged from .80 to .90 for this study (see Table E1, Appendix E).

5.2.3 TA Self-Efficacy

Teaching assistant self-efficacy, the confidence teaching assistants feel in enacting a variety of teaching behaviours, was measured with Boman's (2008) *Teaching Assistant Self-Efficacy* (TASE) scale. The TASE was creating by adapting Streveler's (1993) confidence scale for TAs and Tollerud's (1990) *Self-Efficacy towards Teaching Inventory*. Participants rate their confidence in performing a variety of TA duties on a five-point scale (1= *Not confident* to 5 = *Completely confident*). The 26 items reflect teaching tasks such as giving a lecture, teaching students from different cultural backgrounds and motivating students' interest in a lecture (Boman, 2008). Boman performed a principal components analysis and found a three-component solution best fit the data. The first component consisted of four items reflecting confidence in improving one's own teaching (e.g., "use video feedback to improve your teaching"). The second component included 15 items and assessed TAs' confidence in lecturing and interacting with students (e.g., "motivating student interest in a class," and "encouraging class participation"). The third component (twelve items) measured TAs' confidence in doing written tasks for teaching (e.g., "writing learning objectives" and "planning an organized lecture"). For each of the three components, the mean item score is used for the substantive analyses. The final item on the survey assesses teaching assistants' overall confidence and is analyzed separately from the self-efficacy subscales. The reliability and validity of the inventories by Tollerud (1990) and Streveler (1993) have been supported in studies by Prieto and Altmaier (1994), Prieto and Meyers (1999), and Nugent, Bradshaw and Kito (1999). In this study, the TASE subscales demonstrated adequate to excellent internal consistency. Specifically, the Cronbach's alphas for the Western and Windsor TASE subscales ranged from .75 to .93 (see Table E1, Appendix E).

5.2.4 Preparedness for Teaching

Participants also indicated how prepared they feel for teaching by rating a single item, "Using the scale below, please tell us how prepared you feel for teaching, on a 5-point scale" (1 = *Not at all prepared* to 5 = *Very prepared*).

5.3 Focus Group Interviews

Focus group interviews took place approximately four to six months after the completion of each program. See Appendix C for the complete list of questions used. Appendix D provides focus group demographic information.

Focus group data were interpreted using thematic analysis (Rubin & Rubin, 1995; Miles & Huberman, 1994). At Western, interviews were partially transcribed using notes taken by a research assistant during the interviews, combined with selected quotes that were transcribed word for word. At Windsor, interviews were recorded and then fully transcribed. During the analysis, key themes related to learning and application of knowledge were identified in the text and were then grouped into larger theme clusters. Focus group data from short and long programs were first analyzed separately at each institution, then patterns were compared between institutions.

It is important to note a procedural difference between focus group discussions with short and long program participants at Western. During the first half of the focus group discussion, TA Day (short program) participants often had difficulty recalling the sessions they attended and found it challenging to think of examples of what they learned. When this was the case, the researchers at both institutions made the program agenda (list of sessions) available during the second half of the focus group discussion. Being

reminded of the session titles often helped participants remember concrete strategies they learned and share examples of how they used it in their class. Participants in long programs (ATP and GS9500), on the other hand, had no difficulty recalling key components of the program or thinking of ways in which they applied these in their own practice. In focus groups with long program participants there were few pauses in conversation; participants related their comments to the examples of others in the group and acted much more like a teaching community than a group of separate individuals.

At Windsor, most focus group participants who took part in long programs had also participated in the short programs. All participants were shown the GATAcademy handbook resources (short program).

6. Results

6.1 Quantitative Findings

6.1.1 Western Findings

6.1.1.1 Analysis Plan

A series of split plot Analyses of Variance (ANOVAs) were performed on the three dependent variables (Approaches to Teaching, Teaching Assistant Self-Efficacy and Preparedness for Teaching). The independent variables for these analyses are Program and Timing. The Program variable reflects whether the participants completed the Short Program, TA Day, or one of the two Long Programs, the Advanced Teaching Program or Graduate Studies 9500. The Timing variable reflects the timing of survey administration, whether at the "beginning" (Time 1) or "end" (Time 2) of the program. We are predicting that for participants in the Long Program, their scores on the ATI-R and TASE subscales and the preparedness for teaching item will change significantly from Time 1 to Time 2, but we do not expect the same effect for the Short Program, reflecting a significant Program by Timing interaction. If the predicted interaction is significant, further analyses are performed, termed tests of simple main effects, to determine which specific cell means are significantly different (Gardner, 2001). To continue the example above, a test of simple main effects would be calculated to determine if Long Program participants differed significantly from Time 1 to Time 2 on a variable of interest (e.g., preparedness for teaching). A similar test would be used to examine the same comparison for Short Program participants.

If a predicted interaction is not significant, we then consider the possible effects of each of the independent variable (Program *or* Timing) on a dependent variable, irrespective of the other independent variable. If significant, this finding would be referred to as a significant main effect. When an interaction is significant, it is not meaningful to consider the main effects (Gardner, 2001).

Due to the large inequality in the number of participants who completed the surveys in the two types of programs, the ANOVAs were susceptible to violations of the assumption of homogeneity of variance. Where violations of this assumption were evident, separate independent and paired t-tests were performed for Program and Timing, respectively, for the relevant dependent variables.

Also, because of the small sample size for the long program, exacerbated by the use of listwise deletion to address missing data, it is possible that we may not have adequate power to determine small but meaningful program differences. Further, the impact of the small sample size may be compounded by the fact that a Bonferroni correction was used to address the inflation of type 1 error that may result from multiple comparisons. Therefore, we have included apparent trends in our results; findings that meet the non-

corrected standard of significance (i.e., $p < .05$) but not the conservative corrected standard we have adopted. The inclusion of trends is intended to point out relationships that may be meaningful and deserve to be examined with larger samples.

6.1.1.2 Approaches to Teaching

Consistent with our predictions, there was a significant interaction between Program and Timing for the Information Transmission/Teacher-Focused (ITTF) subscale of the ATI-R [$F(1, 117) = 5.14$, $p = .025$] but the interaction was not in the expected direction. Interestingly, based on tests of simple main effects, participants in the Short Program demonstrated a significant increase in their teacher focus over the course of the program [$F(1, 117) = 6.51$, $p = .012$], whereas their Long Program counterparts did not change significantly over the course of their program [$F(1,117) = 1.48$, $ns.$; see Figure 1 and Table 5].

Figure 1: Mean Teacher-Focused Approach to Teaching for the Short and Long Programs at Time 1 and Time 2
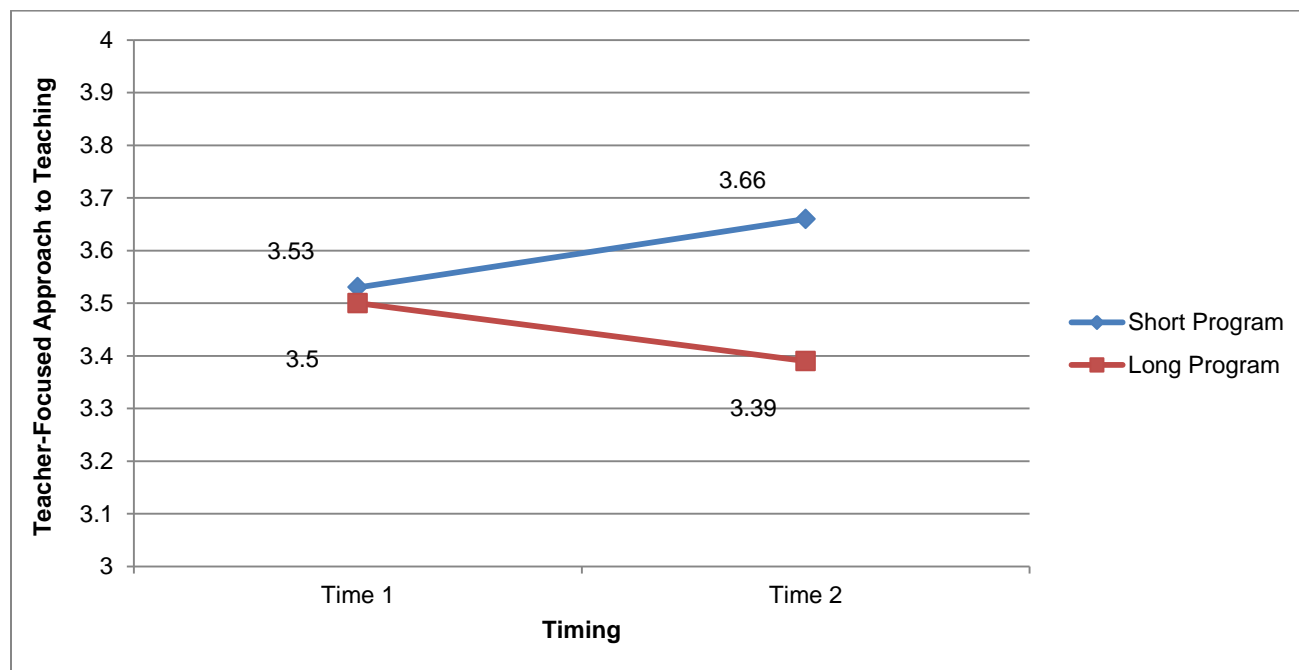
Table 5: Means and Standard Deviations for the Long and Short Programs at Time 1 and Time 2 for the Two ATI-R Subscales

ATI-R Subscale	Time 1		Time 2	
	M	SD	M	SD
ITTF[1]				
Short Program	3.53	.50	3.66	.54
Long Program	3.50	.56	3.39	.71

CCSF[2]				
Short Program	3.70	.61	3.90	.63
Long Program	3.43	.45	3.60	.65

Note. [1]*n*'s = 93 and 26 for the long and short programs, respectively. [2]*n*'s = 94 and 24 for the long and short programs, respectively.

For the Conceptual Change/Student-Focused (CCSF) subscale of the ATI-R, there was a violation of the assumption of homogeneity of variance [as evidenced by Levene's Test of Equality of Error Variances, $F(1, 116) = 7.10$, $p = .009$] for the Time 1 surveys. To address this issue, a paired t-test was performed to examine possible Timing effects and an independent *t*-test to explore possible Program effects. Regardless of Program, participants significantly increased in their student-focused approach to teaching over the course of their programs [$t(117) = -4.32$, $p < .001$; see Figure 2 and Table 6][3].

Figure 2: Mean Student-Focused Approach to Teaching at Time 1 and Time 2 (Short and Long Programs Combined)
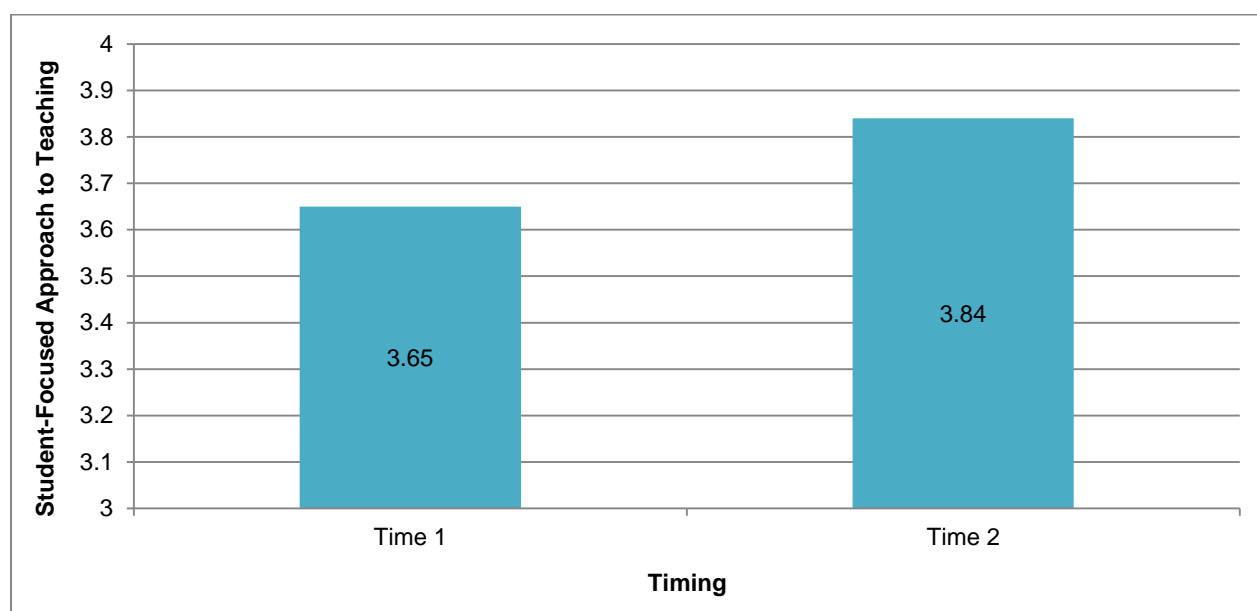
Table 6: Means and Standard Deviations for the Two Approaches to Teaching Subscales at Time 1 and Time 2 (Short and Long Programs Combined)

ATI-R Subscale	Time 1		Time 2	
	M	*SD*	*M*	*SD*
ITTF[1]	3.53	.51	3.60	.58

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[3] For this analysis, we combined the data for the short and long programs.

CCSF[2]	3.65	.59	3.84	.65

Note. [1]*n* = 119 for Times 1 and 2. [2]*n* = 118 for Times 1 and 2.

Participants in the short program, regardless of the Timing of the surveys, were significantly more student-focused in their approach to teaching than participants in the long program [$t(116)$ = 2.25, p = .026; see Figure 3 and Table 7].

Figure 3: Mean Student-Focused Approach to Teaching for the Long and Short Programs
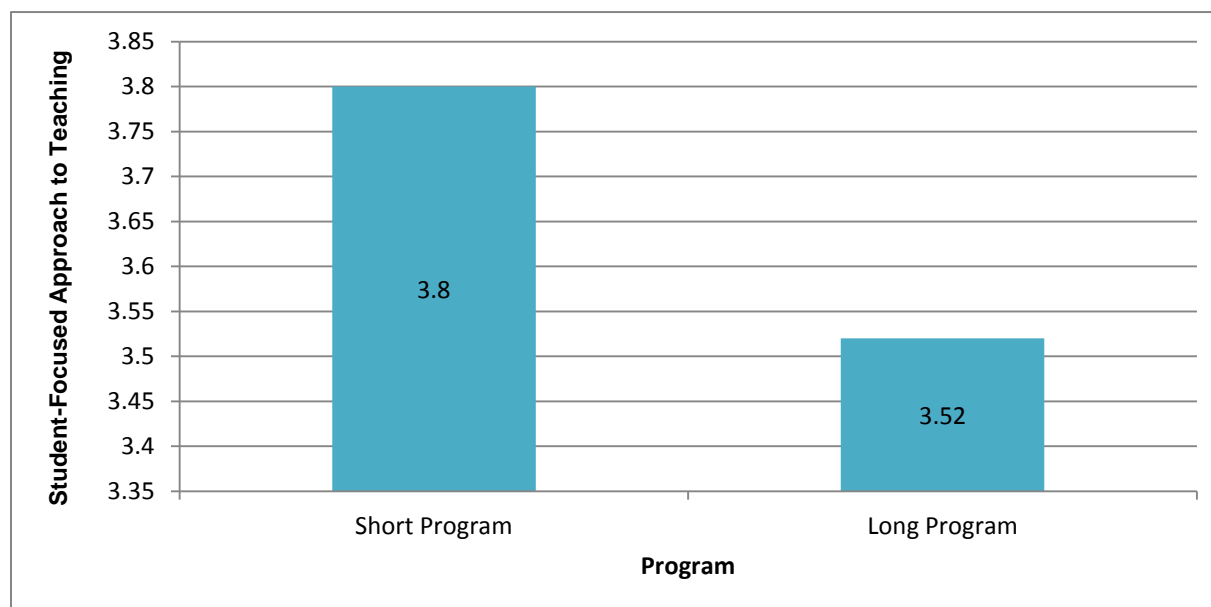
Table 7: Means and Standard Deviations Test for the Two Approaches to Teaching Subscales for the Short and Long Programs (Times 1 and 2 Combined)

	Short Program		Long Program	
ATI-R Subscale	*M*	*SD*	*M*	*SD*
ITTF[1]	3.60	.46	3.45	.60
CCSF[2]	3.80	.57	3.52	.49

Note. [1]*n*'s = 93 and 26 for the Long and Short Programs, respectively. [2]*n*'s = 94 and 24 for the Long and Short Programs, respectively.

6.1.1.3 Teaching Assistant Self-Efficacy

Consistent with our prediction, there was a significant interaction between Program and Timing for the Writing subscale of the Teaching Assistant Self-Efficacy Scale [TASE; $F(1, 132)$ = 13.86, $p < .001$]. Participants in both the Long and Short Programs significantly increased in self-efficacy for writing teaching-related materials over the course of the program [$F(1, 132)$ = 30.64, p < .001 and $F(1, 132)$ = 6.90, p < .01, respectively] but the

increase in the Long Program was larger in absolute value than that of the Short Program (see Figure 4 and Table 8). This was the only significant interaction for the TASE subscales and overall self-efficacy item [$F(1, 132) = 1.77$, *ns.* and $F(1, 135) = 2.14$, *ns.*, for the Interaction subscale and the overall self-efficacy item, respectively]. However, although the Improvement subscale did not meet the conservative level of significance employed in this analysis, it did evidence a trend [$F(1, 134) = 4.17$, $p = .043$]. Participants in both programs increased in their perceived self-efficacy for improving their own teaching over the course of their programs [$F(1, 134) = 21.91$, $p < .001$ and $F(1, 134) = 21.85$, $p < .001$, respectively] but the increase in the Long Program was larger than that of the Short Program (see Figure 5 and Table 8).

Figure 4: Mean Self-Efficacy for Writing Teaching-Related Materials for the Short and Long Programs at Time 1 and Time 2
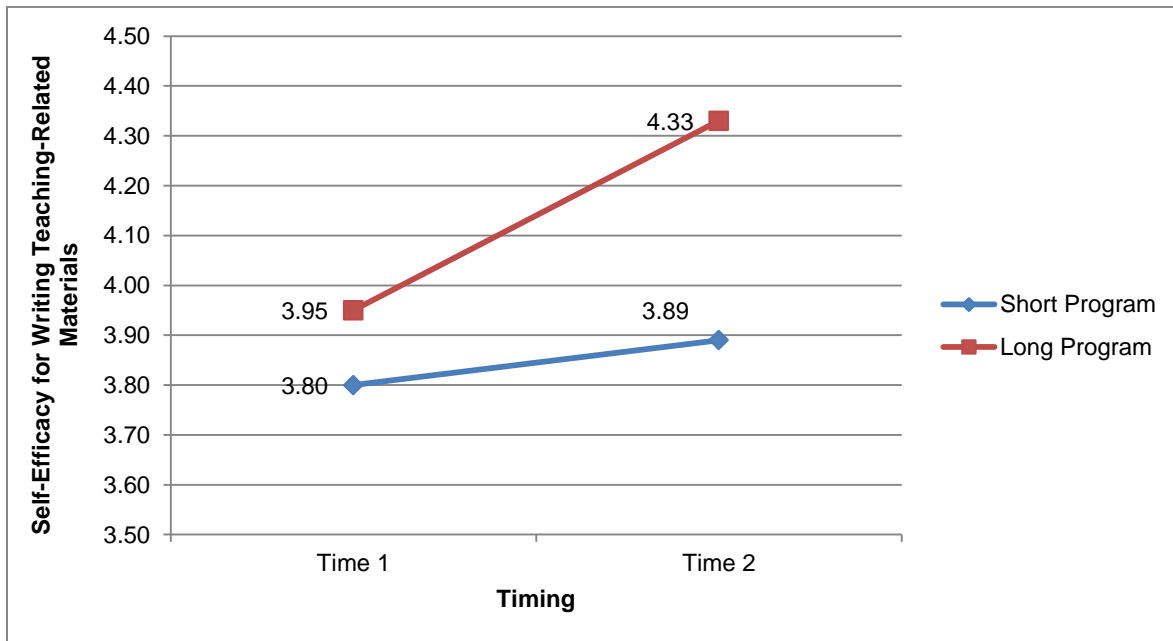
Table 8: Means and Standard Deviations for the Long and Short Programs at Time 1 and Time 2 for the TA Self-Efficacy Subscales and Overall Confidence Item

Self-Efficacy Subscale	Time 1		Time 2	
	M	SD	M	SD
Written[1]				
Short Program	3.80	.54	3.89	.53
Long Program	3.95	.49	4.33	.38
Interaction[2]				
Short Program	3.51	.60	3.84	.58
Long Program	3.56	.57	4.00	.51
Improvement[3]				
Short Program	3.57	.73	3.84	.70
Long Program	3.56	.70	4.10	.64
Overall Confidence Item[4]				
Short Program	3.78	.88	3.94	.77
Long Program	4.04	.69	4.39	.57

Note. [1]n's = 106 and 28 for the long and short programs, respectively. [2]n's = 106 and 28 for the long and short programs, respectively. [3]n's = 108 and 28 for the long and short programs, respectively. [4]n's = 109 and 28 for the long and short programs, respectively.

Figure 5: Mean Self-Efficacy for Improvement of Teaching for the Short and Long Programs at Time 1 and Time 2
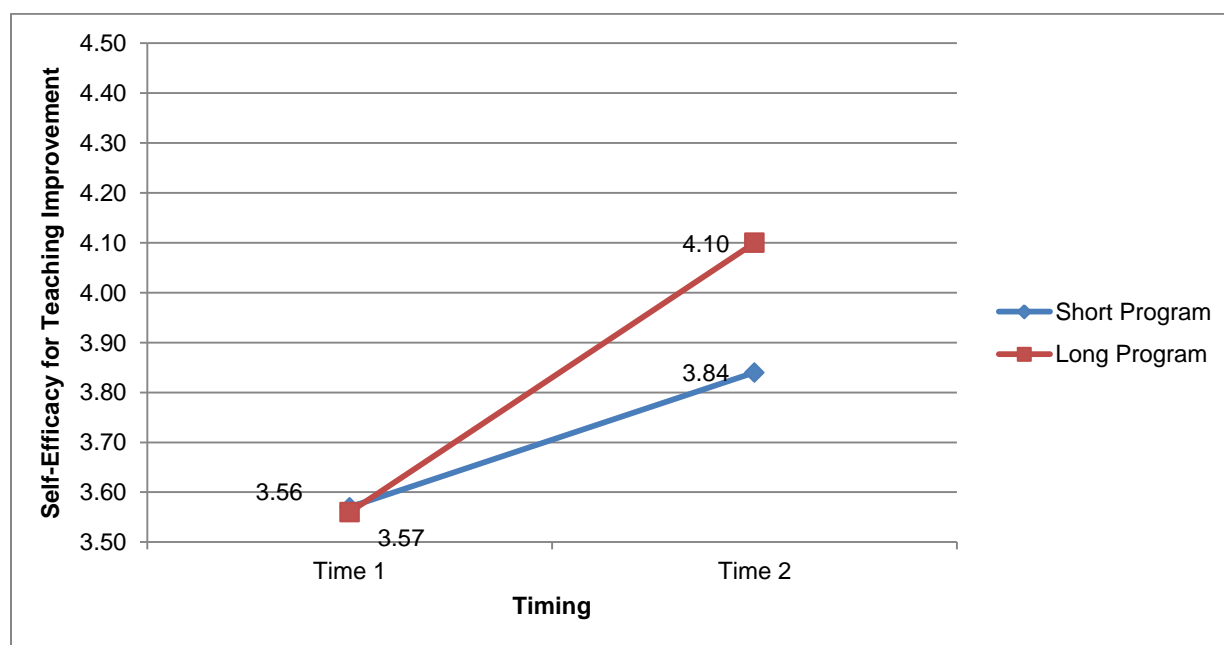
The Interaction subscale as well as the overall confidence item[4] of the TASE evidenced significant main effects for Timing (see Figure 6 and Table 9.). For both the Short and Long Programs, participants were significantly higher on Interaction and overall self-efficacy after their respective programs than before.

Figure 6: Mean TA Self-Efficacy for the Interaction Subscale and Overall Confidence Item at Time 1 and Time 2

Table 9: Means, Standard Deviations and Significance Tests for the Three Self-Efficacy Subscales and Overall Confidence Item at Time 1 and Time 2

	Time 1		Time 2		
Self-Efficacy Subscale	M	SD	M	SD	Significance Test
Written[1]	3.83	.53	3.98	.53	N/A[5]
Interaction[2]	3.52	.59	3.87	.57	$F(1, 132) = 95.24$, $p < .001$
Improvement[3]	3.57	.72	3.90	.69	N/A[5]
Overall Confidence Item[4]	3.83	.85	4.03	.76	$t(136) = -3.54$, $p = .001$.

Note. [1]$n = 134$. [2]$n = 134$. [3]$n = 136$. [4]$n = 137$. [5]When an interaction is significant, it is not meaningful to examine the main effects (Gardner, 2001).

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[4] For the overall confidence item on the TASE there was a violation of the assumption of homogeneity of variance [as evidenced by Levene's Test of Equality of Error Variances, $F(1, 135) = 3.917$, $p = .05$] for the Time 1 surveys. To address this issue, a paired t-test was performed to examine possible Timing effects and an independent t-test to explore possible Program effects.

There were no significant main effects for Program for the Interaction subscale or the overall confidence item but there was a trend for the overall confidence item (see Figure 7 and Table 10). Participants in the Long Program tended to be more confident in their overall ability to perform their TA duties than their colleagues in the Short Program, whereas they were equally confident in their ability to interact with their students.

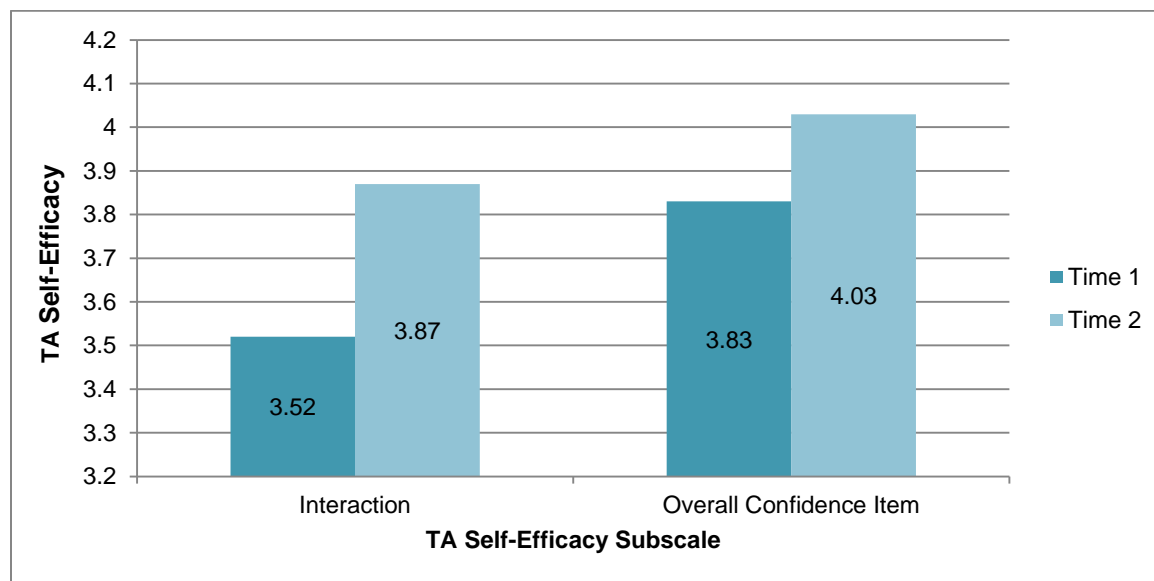**Figure 7: Mean Overall Confidence for the Short and Long Programs**
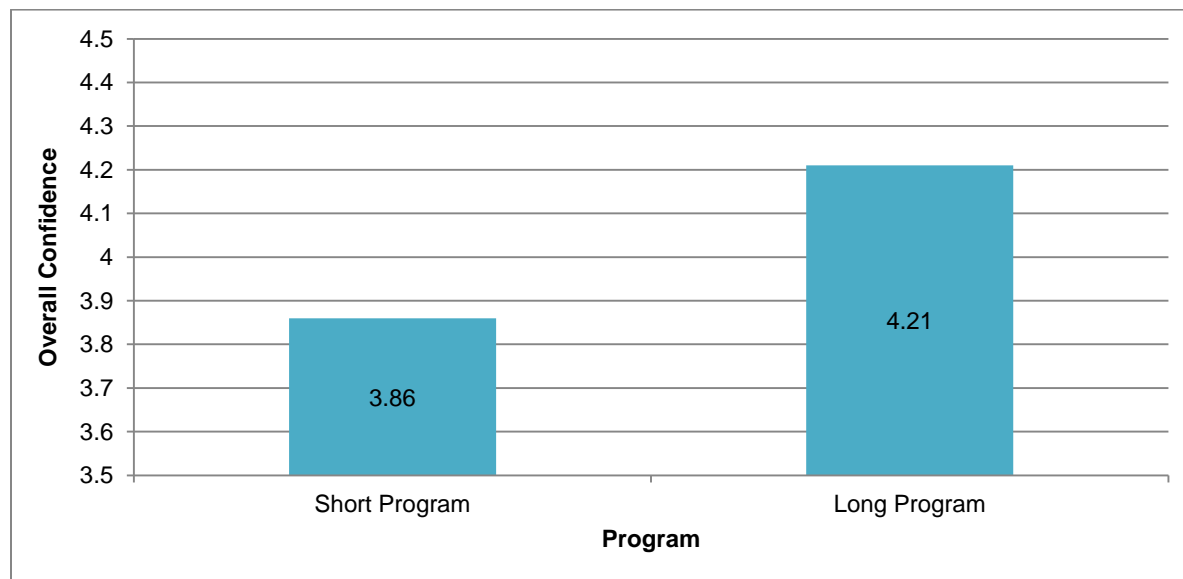
Table 10: Means, Standard Deviations and Significance Tests for the Three Self-Efficacy Subscales and Overall Confidence Item for the Short and Long Programs

	Short Program		Long Program		
Self-Efficacy	M	SD	M	SD	Significance Test
Written[1]	3.84	.50	4.14	.38	N/A
Interaction[2]	3.68	.57	3.78	.49	$F(1, 132) = 0.81$, *ns.*
Improvement[3]	3.71	.66	3.83	.57	N/A
Overall Confidence Item[4]	3.86	.76	4.21	.57	$t(135) = -2.33$, $p = .021$.

Note. [1]*n*'s = 106 and 28 for the long and short programs, respectively. [2]*n*'s = 106 and 28 for the long and short programs, respectively. [3]*n*'s = 108 and 28 for the long and short programs, respectively. [4]*n*'s = 109 and 28 for the long and short programs, respectively.

6.1.1.4 Preparedness for Teaching

There were significant main effects for both Timing and Program for the Preparedness for Teaching item. For both the Long and Short Programs, participants' preparedness for teaching increased significantly from the beginning to the end of their programs [$M = 3.06$, $SD = .893$, and M = 3.58, SD = .822 for Time 1 and 2 respectively; $F(1, 120) = 51.80$, $p < .001$; see Figure 8].

Figure 8: Mean Preparedness for Teaching at Time 1 and Time 2
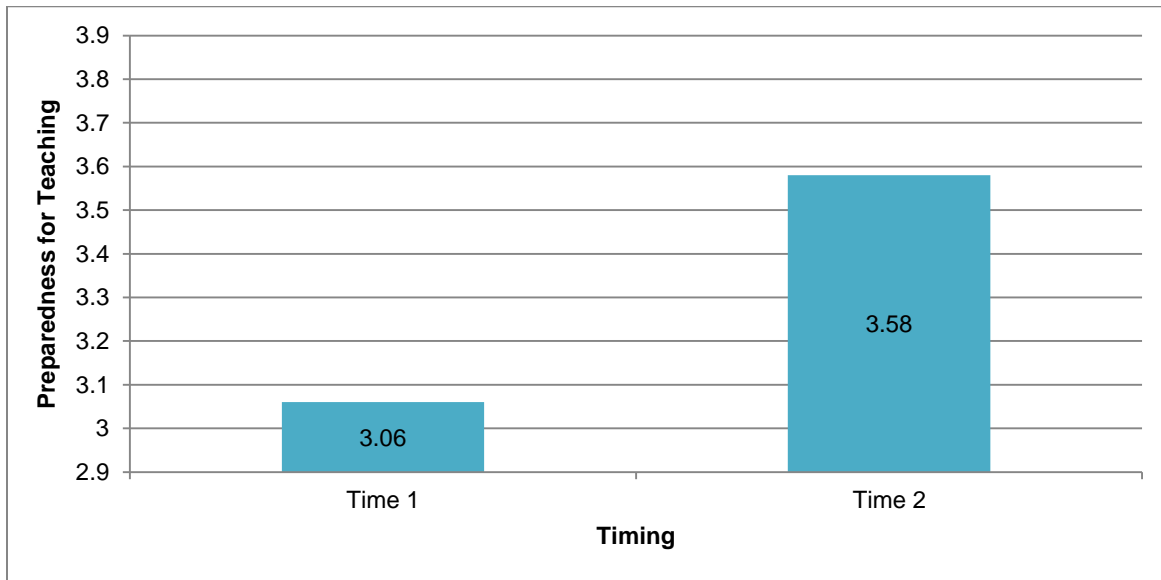
Overall, participants in the long program felt significantly better prepared for teaching than the short program participants [M = 3.67, SD = .761, n = 26 and M = 3.22, SD = .781, n = 96 for the long and short programs respectively; $F(1, 120)$ = 8.25, p = .01; see Figure 9].

Figure 9: Mean Preparedness for Teaching for the Short and Long Programs
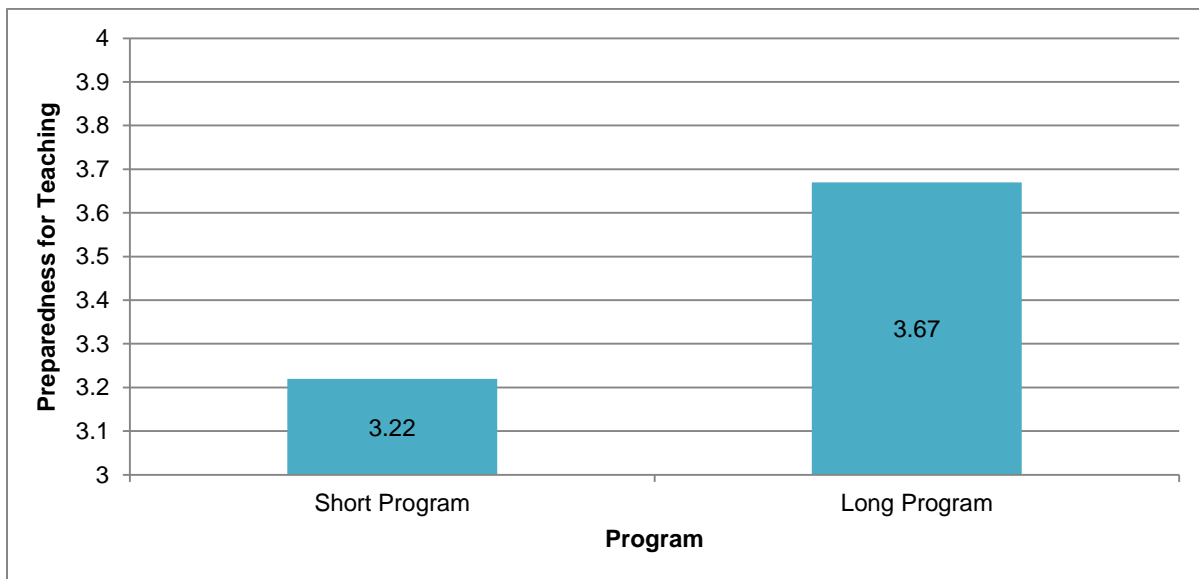
The interaction between Timing and Program was not significant [$F(1, 120)$ = 0.048, ns.; see Table E2, Appendix E].

6.1.2 Windsor Findings

6.1.2.1 Analysis Plan

A series of factorial Analyses of Variance (ANOVAs) were performed on the three dependent variables (i.e., Approaches to Teaching, Teaching Assistant Self-Efficacy and Preparedness for Teaching). With the Windsor research, there were three Program groups: the Short and Long Programs as well as a Control group (i.e., a group which completed neither short nor long programs). As outlined above, Timing reflects the timing of survey administration, whether at the beginning (Time 1) or end (Time 2) of the program. Due to the small number of participants, it was not possible to match individual participants' Time 1 survey with their Time 2 survey. Thus, the Time 1 and Time 2 surveys are largely completed by different participants. This introduces the possibility that any Timing effects may be the result of differences between the Time 1 and Time 2 participants and not the programs (or simple passage of time). Differences between the Time 1 and 2 participants on the major demographic variables were examined and substantive differences between the two Timing groups were found. For example, a higher percentage of Time 1 participants in all Program groups had received teacher training and had previously taught undergraduate students (except for the Control group) than their Time 2 counterparts (see Table 4). Given these differences, any effects involving Timing (i.e., a Timing X Program interaction or Timing main effect) will be interpreted with caution.

6.1.2.2 Approaches to Teaching

Contrary to prediction, there was not a significant interaction between Program and Timing for either the Information Transmission/Teacher-Focused (ITTF) or Conceptual Change/Student- Focused (CCSF) subscales of the ATI-R [$F(2, 210) = 1.243$, *ns.* and $F(2, 207) = 1.696$, *ns.*], respectively (see Table E3, Appendix E). Nor were there any significant main effects for Program or Timing (see Table 11 below and Table E4 in Appendix E, respectively). There was a trend for Program for CCSF such that Control group participants were less student-focused than their Long Program counterparts [$t(111) = -2.03$, $p = .045$; the Short Program participants were not appreciably different than their Long Program or Control Group participants; $t(127) = -1.968$, *ns.* and $t(182) = 0.286$, *ns.*, respectively]. Overall, regardless of the program in which the participants were enrolled or when they completed the ATI-R, they were equally as teacher-focused and student-focused as their counterparts. That said the suggestion that the Long Program participants are more student-centred than Control group participants deserves further investigation with larger samples of Long Program participants (see Figure 10).

Table 11: Means and Standard Deviations for the Long and Short Programs and Control Group with Significance Test (Times 1 and 2 Combined – Windsor)

ATI-R	Short Program			Long Program			Control			Significance Test
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	
ITTF	3.50	.68	99	3.55	.72	30	3.52	.68	*87*	$F(2, 210) = .033$, *ns.*
CCSF	3.54	.76	100	3.85	.70	29	3.51	.81	84	$F(2, 207) = 3.136$, $p = .046$

Figure 10: Mean Student-Focused Approach to Teaching for Short and Long Programs and Control Group (Times 1 and 2 Combined)
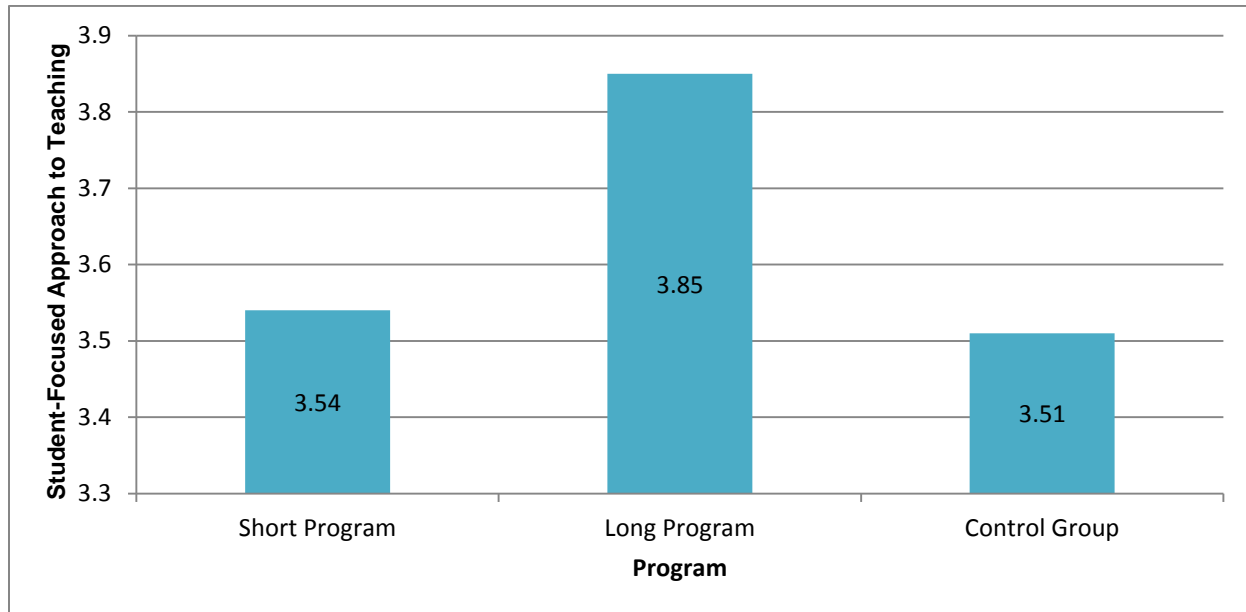
6.1.2.3. Teaching Assistant Self-Efficacy

Contrary to predictions, there were no significant interactions between Program and Timing for any of the three subscales of the Teaching Assistant Self-Efficacy Scale or the Overall Confidence item [$F(2, 282)$ = .555, ns.; $F(2, 284)$ = .981, ns.; $F(2, 292)$ = .172, ns.; $F(2, 292)$ = .386, ns.; for the Written, Interaction, and Improvement Subscales and the Overall Confidence Item, respectively]. Nor were there main effects for Program or Timing for any of the subscales or the overall confidence item of the TASE (see Tables E5-7 in Appendix E, respectively). As with the ATI-R above, regardless of the program or when the participants completed the TASE, they were as confident in their teaching as their peers.

6.1.2.4. Preparedness for Teaching

Finally, there was no Program by Timing interaction for the Preparedness for Teaching item either [$F(2, 230)$ = .646, *ns.*]. Nor was there a main effect for Timing [$F(1, 230)$ = 1.982, *ns.*] but there was a significant main effect for Program [$F(2, 230)$ = 5.018, p = .007], such that the Long Program participants felt significantly more prepared for teaching than their counterparts in the Control group, regardless of the Timing of the survey administration [$t(127)$ = 3.164, p = .002]. Although not significant at the conservative level employed, there was a trend such that the Long Program participants felt more prepared for teaching than participants in the Short Program [$t(135)$ = -2.155, $p < .03$]. Participants in the Short Program did not differ significantly from their colleagues in the Control group [$t(204)$ = 1.823, *ns.*] and therefore felt as prepared for teaching as their Control group peers (see Table 12 and Figure 11).

Table 12: Means and Standard Deviations for the Short and Long Programs and Control Group at Time 1 and Time 2 for the Preparation Item

	Time 1			Time 2			Total[1]		
	M	*SD*	*N*	*M*	*SD*	*n*	*M*	*SD*	*n*
Preparation Item									
Short Program	3.45	1.01	53	3.54	.97	54	3.50	.99	107
Long Program	3.67	1.05	15	4.20	.86	15	3.93	.98	30
Control	3.21	1.10	70	3.28	1.07	29	3.23	1.09	99
Total[2]	3.36	1.07	138	3.56	.97	98	-	-	-

Notes. [1]Means and standard deviations for the main effect for Program. [2]Means and standard deviations for the main effect for Timing.

Figure 11: Mean Preparedness for Teaching for the Short and Long Program and Control Group
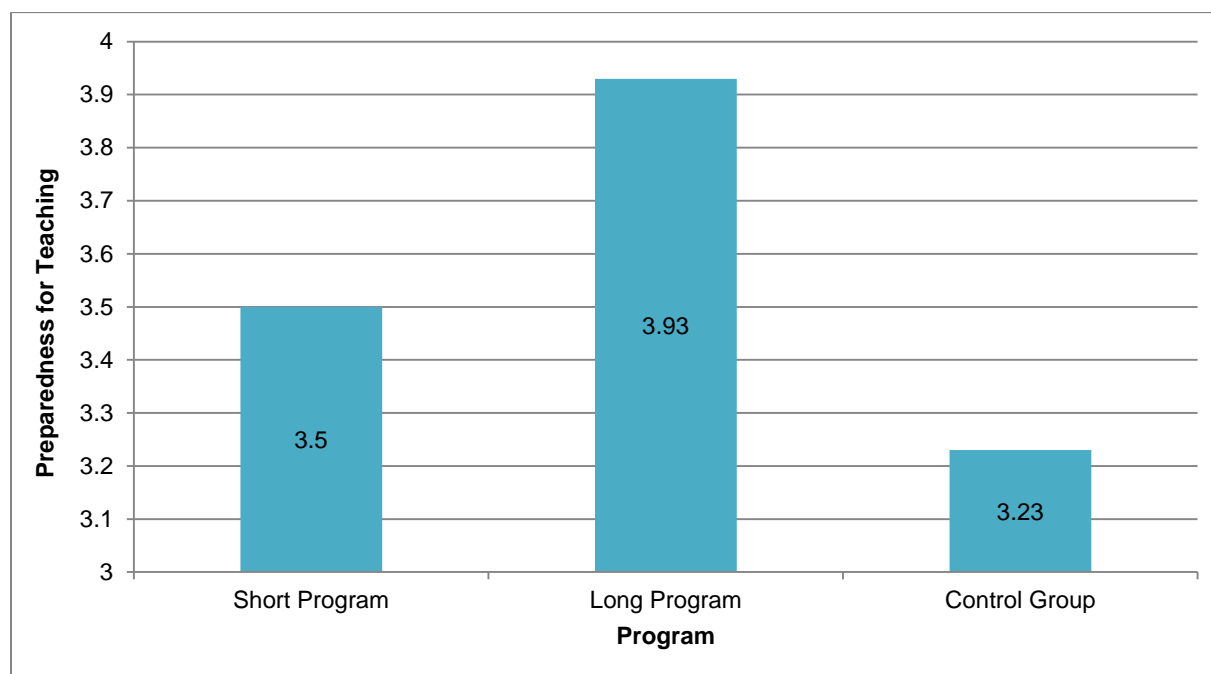
6.2 Qualitative Findings

6.2.1 Western Focus Group Findings

The goal of focus group interviews was to gain a more nuanced understanding of what participants learned in long and short programs, how they applied this knowledge in their own teaching practice and how their approaches to teaching changed as a result of training. Focus group participants were asked to describe (1) their reasons for participating in training, (2) the components of the program that were most beneficial to them, and (3) how the programs impacted their approach to teaching – that is, of the teaching strategies and

approaches they learned, which ones they have used in their own teaching. See Figure 12 for a summary of the main themes.

6.2.1.1. Motivation for Enrolling in Teaching Development Programs

TAs enrolled in short and long programs for different reasons. As TA Day (short program) is offered at the beginning of the academic year and is intended as an orientation to teaching at each university, participants in these programs enrolled to (1) learn about expectations for TAs and get information about teaching at the institution, (2) reduce their own anxiety about teaching, (3) find out what expectations for the TA role were in Canada (international participants), (4) fulfill a requirement in their department, or (5) improve their teaching (i.e., for the handful of TAs who had taught before). Very few, if any, TAs saw the program as a form of career development or as an opportunity to build their CV.

> *So I come to TA Day because I actually just finished my undergrad this July and August… so I realized that what separates me and the students I'm going to be TAing is just a year and a half by age. And I'm not sure… what knowledge I can give them, or I don't feel like I'm ready yet so that's why I decide to go to TA day and just to get myself prepared… to actually offer some knowledge and make them feel comfortable but also trying to avoid any conflicts between me and the students and anything.*
>
> *(TA Day, master's student, health sciences)*

> *I was actually terrified to TA. I worked for a couple of years after finishing my undergrad degree so I was kind of removed from the whole university classroom experience. I didn't really have TAs in my undergrad because I went to [a small university] so it was smaller classes so I had no idea what to do as a TA. So I thought it was a good opportunity to get some information on strategies to… integrate into my TA style. But I also thought it would be a good opportunity to meet other individuals who maybe are previous TAs or first TAs who are looking to learn because then you can create like a network of support.*
>
> *(TA Day, master's student, social science)*

Figure 12: Main Themes Identified in Western Focus Group Interviews

SHORT PROGRAM	LONG PROGRAM
Motivation to enrol in teaching development programs	
• to learn about expectations and institutional context • to reduce anxiety about teaching • to understand expectations for TA role in Canada (international participants) • because it was required • to improve teaching • to network with peers across disciplines/build community	• career development (build CV) • gain hands-on teaching experience • self-development • professional development as a teacher • improve presentation skills • network with peers across disciplines
Most beneficial components of teaching development programs	
• concrete teaching strategies (e.g., facilitating discussions) • testimonials: personal experiences of peers and faculty	• course design/backward design • role-play microteach • capstone project • readings on pedagogy • opportunity to reflect on university teaching as a profession
Application of knowledge – What TAs use in their own classroom after training	
• student engagement strategies & strategies for facilitating discussions • marking and time management strategies • classroom management/handling conflict • clarifying expectations for undergraduates and understanding undergraduate expectations for TAs • evaluating teaching/seeking feedback on teaching	• increased use of student engagement techniques / greater student focus • course design • seeking/receiving student feedback • sense of confidence in teaching ability and teaching style • self-reflection

A number of TAs talked about TA Day as an opportunity to connect with others from different departments and start creating a social network at a new institution, and they discussed how getting oriented to teaching helped reduce their anxiety about taking on a new role with which they were completely unfamiliar. The main motivations of long program participants, on the other hand, were career development, self-development, as well as professional development as a teacher. Long programs are typically attended by more experienced

graduate students (years two to four of doctoral programs, or year two of master's programs). These graduate students wanted to develop their teaching skills either because they had taught before and wanted to get better or because they had not had an opportunity to teach in their discipline during graduate school, but anticipated applying for teaching positions and felt that the hands-on teaching experience in the program would give them an advantage in the job search. Some participants expressed a desire for more pedagogical knowledge because they received little direction in their home department. Many were working towards the Western Certificate in University Teaching and completed the long program as one of the requirements towards the certificate. A few also wanted to improve their presentation skills and wanted to meet colleagues from across the university in order to experience a variety of disciplinary perspectives. A few international graduate students who had taught in their home cultures wanted to gain Canadian teaching experience by enrolling in the program, again to increase their chances of getting a job after graduation.

> *One of the things that's very exciting about the PhD in women's studies is that we develop our own courses and then we have the opportunity to teach one. And so [participating in the ATP program] was very kind of strategic for me, and then I wanted to get the experience, you know, both theory and practice before I taught my fourth-year course.*
>
> *(ATP, doctoral student, arts & humanities)*

> *I've noticed that in quite a few calls for sessional applicants they look for a "demonstrated commitment to teaching." [One way to] demonstrate your commitment to teaching [is to] run a sessional course within your department and you'd get evaluations. But if that is not something you have access to, then [participating in a workshop like ATP] is probably a really good thing... it indicates that you're willing to go outside of the normative career path that is usually imagined for you.*
>
> *(ATP, doctoral student, science)*

> *Aside from making me feel more confident, it also does make you marketable in an increasingly competitive academic environment.*
>
> *(ATP, doctoral student, engineering)*

Long program participants, therefore, were much more strategic in their choice of the program and reflected on how the program would contribute to their career plans, while the short program participants primarily sought concrete, practical information about teaching, wanted role clarification and looked for advice on how to get started in a new role.

6.2.1.2. Most Beneficial Components of Training – Short Programs

Short Program. During the focus groups, we asked participants which sessions were the most beneficial to them during the day-long program. Almost all participants emphasized that the most useful sessions were (1) those in which they walked away with concrete teaching strategies that they could directly apply in their own classroom (such as the session on facilitating discussions, the first day of class, or *Demonstrology*), and (2) those in which they heard about the personal experiences of other TAs and faculty, because these sessions helped reduce their anxiety about stepping into the TA role. In the latter, participants noticed the way presenters modeled good teaching or demonstrated how to connect with an interdisciplinary audience through humour and were inspired by these examples before taking on teaching on their own.

The best thing for me it was the presentation by [the keynote speaker at TA day] – that guy was awesome!… Even though I know nothing about chemistry, he got my attention because he was presenting in a way that makes the class very relaxed, that you laugh. I believe that if you make people laugh, people will listen to you.

(TA Day, doctoral student, arts & humanities)

A doctoral student in science spoke eloquently about a "light-bulb moment" in a session on effective science demonstrations with a faculty member who taught his first-year biology class during his undergraduate degree. The learning activities in which he participated as an undergraduate suddenly made sense and he understood how they all fit together to promote student learning. The new TA could now appreciate the careful design and thoughtful planning that resulted in the learning activities he experienced as an undergraduate. Understanding why the learning activities were effective helped encourage him to try some of the demonstrations in his class.

I had [the instructor of the Demonstrology workshop] in first-year biology about five years ago – I never really understood why he did the things he did in lecture – it's like a mystery to me. But then after attending that session, I realized how effective he actually is as a university professor, like the things that he does to get his point across or to communicate the information to all the students is really amazing…. I had the opportunity to guest lecture in my second term and I used a lot of the same techniques that he was suggesting. We had student evaluations at the end of them, and I think that was one of my stronger areas and I think that's at least partially due to hearing the strategies he uses while teaching.

(TA Day, master's student, science)

6.2.1.3. Application of Knowledge – Short Programs

Focus group participants were asked to describe teaching strategies they learned during the program and that they adopted in their own teaching. Participants used their newly found knowledge in five main areas: engagement and discussions, marking and time management, classroom management and handling conflict, expectations for undergraduates and evaluating teaching.

Theme 1: Engagement/discussions

The session on facilitating discussions was nominated as the most beneficial component of TA Day by the majority of focus group interviewees, and discussion strategies were some of the most frequently applied pieces of learning. Several tutorial TAs in social science tried out all of the active learning strategies, going through them systematically week by week until they found what worked best. Others chose two or three favourites and used them throughout the term.

I found the session on facilitating discussions probably saved my life, especially at the beginning of the year when a lot of the students are very uncomfortable being involved in classroom discussions… I will come in to the classroom with this great idea that's going to get discussion going and then it bombs… so you have to think very quickly of alternative strategies to get them talking. I have all these discussion methods in the back of my head all the time… so I can kind of rearrange how I'm structuring that particular discussion.

(TA Day, doctoral student, social science)

TA Day participants reflected on how to engage undergraduates and how to make learning relevant to them. TAs who watched a session in which the presenter used clickers and talked about promoting engagement in their class by asking questions that are similar to clicker questions. They reflected on the use of humour by presenters and thought about creating a supportive, relaxed learning climate in their class. Others used a variety of media such as film clips and news footage to spark discussion in their class and hook students' attention.

> *Although we didn't have clickers in my classes when I was guest lecturing… there were only about 30 students, so it was small enough that I could ask questions and so they're not just sitting there passively taking notes... I was teaching about taxonomy in arthropods, which are insects and other related creatures… I would show them a picture and ask 'what group do you think this belongs to?' and some of them were really surprising… I would try to use interesting examples and get them engaged and then they would all chatter away after I'd asked the question. I feel like if I'd just said 'this is an arthropod' they would have been like 'okay, that's nice.'*
>
> *(TA Day, master's student, science)*

> *I try to make people laugh. I think it's important, especially for a language professor, to create a relaxing environment because if you are learning a language and you feel very stressed, you're not going to say anything, because for sure you are going to make a mistake. It's a new grammar, new vocabulary, of course you are going to make a mistake. But it's okay, you're learning... that's what we're here for, to learn together.*
>
> *(TA Day, doctoral student, arts & humanities)*

Theme 2: Marking and time management

The majority of focus group participants reported that they used time management strategies learned during TA Day when they had to mark a large number of assignments. Many TAs had never thought of having to develop a strategy for managing their teaching time, so TA Day sessions (both the keynote, a session on time management and the panel of veteran TAs) alerted them to the fact that they needed to develop a plan.

> *When I went to TA Day, it was like opening my eyes that there may be some problems with managing my time, so there were some good hints – how to organize your time between like your course and TA and projects. I used some of them… because from before that I didn't expect I would have such difficulty.*
>
> *(TA Day, master's student, science)*

The program also helped them become more mindful about consistency in marking and prepare for answering questions from students regarding marking. While there is no specific session on marking during TA Day, the panel of veteran TAs addressed marking strategies.

Theme 3: Classroom management/handling conflict

A session on "Managing Difficult Classroom Situations" is one of the sessions of TA Day attended by the largest number of TAs besides the keynote speech. Approximately 50% of all participants experience the session in which trainers disrupt the class and demonstrate a variety of ways to respond to difficult students.

Classroom management strategies were one of the main pieces of learning that TAs took away from the program, mainly because many of them simply have not thought about any classroom conflicts before

attending this workshop. The session clearly identified a gap in their knowledge and highlighted the need to prepare for and expect challenging conversations with students.

> *I hadn't ever really thought about [conflict resolution] before… what I would do in those sort of situations. Having some previous knowledge in what I could do in those situations to help diffuse the situation, and help so the whole class doesn't get out of control, I think is really important. [For] example… not to single them out… because then it's still putting that pressure, but trying to do everything in a really discreet way.*
>
> *(TA Day, master's student, science)*

Theme 4: Expectations for undergraduates

TAs emphasized that learning about teaching helped them reflect on their own expectations for undergraduates and to consider undergraduates' expectations for them as instructors. They tried to put themselves in the students' shoes again and again during the term in order to make learning relevant to their students. They learned and applied strategies for conducting a pre-assessment of student knowledge at the beginning of the term, discussed the rules of engagement in class and worked with their students to create rapport among class members. They took the time to clarify their expectations for undergraduates at the beginning of the term and spent time explaining and promoting academic integrity among their students.

> *The session I used most was the preparation for the first class. Sharing, discussing ground rules, clarifying what expectations are, and I felt that was very helpful, just going through in my own mind, preparing what the rules of engagement would be.*
>
> *(TA Day, master's student, social science)*

Theme 5: Evaluating teaching

A number of focus group participants took the initiative to seek feedback from their students during the term in order to improve their teaching on their own initiative. The university does not have an official teaching evaluation process in place for TAs who facilitate labs and tutorials. End-of-term teaching evaluations are only available to TAs who are the instructor of record for a course. While some departments conduct informal end-of-term evaluations or provide feedback to TAs through their supervisors, many graduate students expressed a need for both formative and summative evaluations that they could use to improve their teaching and/or use as evidence of teaching effectiveness when they develop their teaching dossiers. The participants who took the initiative to ask their class for feedback used an informal "stop, start, continue" method in class or asked students to suggest three things they liked about the class and three things that could be improved. All feedback they solicited from their students was confidential and anonymous.

> *I had them fill out an evaluation because I was only teaching one class and… I had some criteria for them to evaluate me on, and then also write down three things they thought I did very well and three things I could improve on, and almost every student talked about how I was engaging…. and I think that's definitely as a result of some of the things that I learned during TA Day, especially in Demonstrology.... I figure if I go in and do it and don't ask for any feedback, I don't really learn very much.*
>
> *(TA Day, doctoral student, science)*

6.2.1.4. Most Beneficial Components of Training – Long Programs

Participants in long programs listed the modules on course design, role-play microteaching, capstone projects, readings on pedagogy, and the opportunities to discuss and think about university teaching as a profession as the most beneficial components of their teaching development. Long programs included the Advanced Teaching Program (ATP) and the Graduate Studies 9500: Theory and Practice of University Teaching course (GS9500). In addition to benefitting from concrete learning approaches and learning activities, many of the long program TAs felt that training increased their confidence and preparedness for teaching.

In the course design module of ATP, participants felt they benefitted most from discussions of backward design (Wiggins & Tighe, 2006), opportunities to have interdisciplinary conversations with peers about writing effective learning outcomes and designing learning activities that help achieve these outcomes. They gained confidence in constructing effective lectures that included clear learning outcomes and focused on developing students' skills rather than just on delivering content. A doctoral student whose department requires candidates to design a new course as part of the comprehensive exams found the resources from the program so useful that she decided to share them with other graduate students in her department.

> *Because I'm in women's studies – we spend a lot of time talking about feminist pedagogy, whether that's formally or informally. I think it was a couple of years ago, but there was a whole day on feminist pedagogy… The information that those of us who were in ATP learned, then we share it. So there's a lot of informal knowledge transfer going on.*
>
> *(ATP, doctoral student, arts & humanities)*

Microteaching is a central component of both long programs in the study. It was identified as one of the most beneficial components of TA training by every focus group participant. Graduate students complete three ten-minute microteaching sessions or mini-lessons, working with small groups of four to five peers who act as their learners and give feedback on their teaching. Microteaching presentations are video-recorded, so participants have an opportunity to review their teaching after each session. Participants emphasized that the microteaching sessions allowed them to put theory into practice and incorporate active learning techniques in their lessons, try out student centered teaching approaches or experiment with new technologies in a safe learning environment.

In addition, ATP features a unique role-play microteaching session that invites participants to develop effective communication strategies for handling challenging classroom management scenarios and other difficult dialogues. The role play was the highlight of the program for the majority of ATP participants. In the role play, they were asked to speak to students who answer their cell phone in class, support students in crisis, deal with grade revision requests from students and facilitate a conversation between the department chair and students who have concerns about safety in their lab. A number of TAs reported facing conversations that were similar to the role play scenarios after the program and talked about feeling more confident in their ability to respond appropriately. A doctoral student in science said that the session was useful because participants did not realize *"how bad and how fast things can go wrong"* during difficult conversations with students and colleagues. One participant even used his role play experience in a successful faculty interview – he was asked to give an example of a classroom management challenge and he was able to impress the hiring committee with the strategies he used during the role play in ATP.

The capstone projects in ATP and the course design projects in GS9500 also stood out as beneficial components of teaching development. These assignments allowed participants to take risks and experiment

with new course design elements, such as including group projects and presentations in their courses and making these assignments a significant part of the grade in the course.

A key difference between short and long programs at Western is that no readings are assigned in short programs, while long program participants engage with the scholarly literature on teaching and learn about motivation, curriculum design principles, the goals of higher education, assessment, student diversity, civility and other current teaching issues through current publications on teaching. Several TAs returned to the readings regularly to get ideas for active learning activities or applied the principles they learned through the readings on developing effective exam questions or creating authentic assessments.

> *The discussions, combined with the readings, gave me a rich sense of the possibilities of university level teaching that I carry around with me and draw upon on a daily basis.*
>
> *(GS9500, doctoral student, education)*

Long program participants also reported that they benefitted from discussions of teaching as a profession and valued the opportunity to reflect on the complexity of the teaching role in higher education. They also learned from the differences between teaching approaches in various disciplines.

> *I really appreciate the way that GS9500 treated teaching as a complex, context-specific, and socially situated endeavour. This perspective fostered a lot of rich discussion that helped me think about the different purposes that teaching serves in different disciplines or programs.*
>
> *(GS9500, doctoral student, education – written comments)*

> *Coming to ATP, and actually taking the sessions with people from other disciplines, really assisted me in thinking through how I actually form my arguments in a way that is accessible to people from all disciplines, which was really important and something I couldn't have gotten from hanging out in my department.*
>
> *(ATP, doctoral student, arts & humanities)*

6.2.1.5. Application of Knowledge – Long Programs

When asked for examples of how they applied learning from the long programs in their own teaching, participants described a shift towards student-centered and inquiry-based teaching approaches. They gave examples of how they used the principles of course design to align learning activities with assessments and learning outcomes and how they engaged in frequent reflection on their teaching. The five main themes that emerged from their narratives are detailed below.

Theme 1: Increased use of student engagement techniques/student focus

Almost all of the long program participants gave vivid examples of using active learning techniques in their teaching. They tried out *dotmocracy* (Diceman, 2010), an active learning activity that involves voting with colour dots, used a snowball activity to engage a large class in decision making, incorporated a debate in class or started class with a brainstorm activity with images to engage visual learners. One TA asked her students to create their own survey to explore issues in the course.

What was different from the active learning examples of short program participants was that long program participants reflected on the learning outcomes they were promoting through the use of learning activities and modified active learning techniques to match the needs of a variety of learners with different learning styles.

When we talked about active learning activities, when I researched it for the capstone, learning the reasons why they are effective, like that there's different kinds of learners, that it's good to break [lectures] up, especially in a discipline where it's a lot of chalk and talk. What's the actual value? It's not just you're throwing it in there, it's because you want to get them [to engage with the material] hands on, get them thinking in different ways, get them engaged on a different level. Knowing the reasons for why that's really useful to do.

(ATP, doctoral student, science)

Long program participants also talked about using active learning activities as pre-assessment of prior student knowledge or as a way of assessing whether students had mastered the material. One of the graduates of the GS9500 course experimented with letting her class choose some class topics and giving greater freedom to students to guide discussion.

Long program participants also commented on the challenges of moving towards more student-centered teaching approaches. Occasionally they encountered resistance from students who just wanted to get the "right answer" or did not want to be involved in discussions. As a science TA said, *"I feel like there is a bit of anxiety when I don't lecture at them."* Graduates of the GS9500 course in science also emphasized the need to articulate the value of active learning to students and helping students understand what they can expect to get out of class discussions and experiential learning activities.

Long program participants described a clear conceptual change in their approach to teaching in the focus groups when they talked about designing new courses from the students' perspective, and making decisions about assessment and evaluation with student learning outcomes in mind. In the following quote, a student in arts and humanities talks about designing a new course as part of her comprehensive exams during the PhD.

But specifically relating to the ATP, what I found really amazing was to think about it from the student point of view. And I think that this is almost like a light bulb – so obvious and yet it isn't. And when one sees most people's syallbuses [sic], that's not the way that they are. And so for me, that was a fabulous way of learning how to put together my syllabus. I've taught in the past... and I've put together a syllabus… but this was different, because I was totally thinking about what I think the students will get out of it, and having that dialogue with myself. And when I came to teach the course… it makes it so much easier because I knew what the evaluation was going to be, I knew why I was having that evaluation. So it actually took off some of the pressure. And I got very good course evaluations.

(ATP, doctoral student, arts & humanities)

Theme 2: Course design

Most long program participants were not familiar with formal course design principles before attending the workshops, and identified backward design and course design as one of the biggest areas of learning from the program. The majority of participants talked about revising their courses or tutorial plans after the program to create better alignment between learning outcomes and learning activities. Several TAs took the initiative to work with faculty in their department to update courses using the principles they learned in ATP or GS9500.

I'm giving a guest lecture in a couple of weeks on the Industrial Revolution... I will be utilizing many of the tools from ATP in order to structure that lecture in a way that conveys information appropriate to the learning objectives of the course and not necessarily trying to pound their heads full of content.

(ATP, doctoral student, social science)

> *One of my goals in teaching is to teach the idea and make sure the students are able to apply the idea to the real world, instead of some theories they have in their heads. So I was able to state that clearly in the objective – you should learn this idea, you should be able to understand how it relates to what's happening in the world. And I was able to get them to use some of the ideas we learned... we talk about how government policy affects exchange rates, how it affects the trade balance. And so they had to look at – some of them were from China, the US, Hong Kong – whatever government policy they wanted they could take and analyze it and so we discuss how some of these things relate to each other.*
>
> *(GS9500, doctoral student, social science)*

A graduate student in electrical engineering designed a course in which her students worked in teams throughout the semester to create an app (application software) for mobile phone devices. She talked about the value of encouraging the students to deal with a messy, real-world problem and articulating the value of this difficult experience to students. While introducing a new assignment in the course was risky, she felt that she learned from supporting the students during the inquiry and design process that was at times really frustrating for them. At the end of the course, she invited faculty members from her department to serve as a panel of judges and listen to presentations by each of the student teams – resulting in a highly engaging, relevant learning experience for the students.

Theme 3: Asking for/receiving student feedback

Many of the long program participants took the initiative to ask for feedback on their teaching from students. They constructed their own midterm formative feedback questions or simply asked their students what helped and hindered their learning. Upon receiving feedback, they reflected on what worked and what did not, and made changes to support student learning better. Several TAs also reported receiving better teaching evaluations from their students after the course. The undergraduate students in the tutorial section of one of the participants commented on the course evaluations that he taught "better than the professor."

Theme 4: Sense of confidence in teaching ability and teaching style

The majority of long program participants talked about gaining greater confidence in their ability to teach and present as a result of the program, and using this newfound confidence in more independent teaching assignments. One student was offered an opportunity to teach her own class and asked the department to defer her teaching until after she completed the GS9500: Theory and Practice of University Teaching course and felt more confident in her teaching skills.

> *You can always go in feeling confident about what you are going to teach, that you have some level of control. Gives you so much more freedom. You have a specific aim and you are going to assess it in a certain way. I'm more relaxed in the classroom.*
>
> *(ATP, doctoral student, social science)*

Participants' sense of confidence resulted from positive feedback during microteaching sessions, from the opportunity to see other teachers from a variety of disciplines teach using a variety of teaching approaches, and from the opportunity to put theory into practice and try out student engagement techniques in a safe learning environment.

Theme 5: Self-reflection

Long program participants demonstrated a high level of reflection on their teaching after the program. Many of them talked about continuously revising their learning activities and materials to accommodate students with a variety of learning styles and levels of prior knowledge. They talked about asking for feedback in order to find out what was hindering student learning and how they could explain concepts more clearly.

> *It positioned me better to reflect critically about those issues I usually worry about. For example, when you are grading and you just kind of realize that every student seems to be getting it wrong all the time. And I go 'Okay, this is not what I thought I was teaching.' So what could be responsible? Does it have to do with delivery?*
>
> *(GS9500, master's student, engineering)*

Long program participants also talked about the opportunities they had within the course to reflect on teaching as a profession, to understand the complexity of the university professor's role and to reflect on all the planning and design that makes good teaching possible. They also reflected on their approach to teaching while watching their microteaching videos and talked about how they experimented with the student-centered approach.

6.2.2 Windsor Focus Group Findings

The Windsor focus groups used the same process and had the same goals as those at Western, which were to gain a more nuanced understanding of what participants learned in long and short programs, how they applied this knowledge in their own teaching practice, and how their approaches to teaching changed as a result of training. See Figure 13 for a summary of the main themes. Focus group participants were asked to describe (1) their reasons for participating in training, (2) the components of the program that were most beneficial to them, and (3) how the programs impacted their approach to teaching – that is, of the teaching strategies and approaches they learned, what they have used in their own teaching. The comments were transcribed directly from the audio recording. When reviewing the focus group data for themes, the Windsor research team of six people individually reviewed the transcripts and then met as a group to reach consensus around identifying 96 sub-themes. These sub-themes were then combined into seven major themes. There was clear overlap in the comments between why the participants chose to attend and what they gained from participation, and so the two answers are combined.

One major difference from the Western data was that the majority of participants in the focus groups were from the short program, GATAcademy. The comments from two participants are not included in the analysis. One person attended GATAcademy but was not a graduate student or a TA, and another person did not attend GATAcademy but received the handbook resources.

Overall, each participant identified benefits, and many comments indicated appreciation for the interactive methods modelled in the workshops. A few participants mentioned having difficulty remembering what they learned during short workshops or having trouble implementing what they learned in their own classrooms, particularly those who only attended the short event, GATAcademy.

6.2.2.1 Theme 1: Concrete strategies/practical reasons

The greatest number of comments was about concrete strategies and practical reasons for attending events. A few participants thought that it was mandatory to attend GATAcademy, but most were aware that it is a voluntary event. The reasons for attending and what they gained from the event were often discussed at the

same time, suggesting a match between expectations and experience. As a result, both sets of comments were addressed together and categorized by sub-theme.

Figure 13: Main Themes Identified in Windsor Focus Group Interviews

TA MOTIVATION TO ENROL IN TEACHING DEVELOPMENT AND WHAT TAs GAINED FROM PARTICIPATING
Theme 1: Concrete teaching strategies/practical reasons
- Work experience   - Knowledge of being a TA   - Understanding the institution's context   - Feeling of competence and confidence   - Time management and efficiency   - Teaching skills (general)   - Technology   - Student engagement   - Facilitating activities, discussions and labs   - Advising students on writing papers and essays   - Marking   - Plagiarism   - Planning and Design   - Resources
Theme 2: Relationship/communication with instructor
Theme 3: Peer network
Theme 4: Intrinsic motivation
Theme 5: Professionalism

Work experience
TAs from a variety of disciplines and levels saw their involvement in both short and long programs as important for their future careers, in addition to providing practical work skills for their current job as TAs.

> …I want to be a professor so I want to make sure my CV looks good so I need to develop my professional development section and doing things like the GATAcademy and all these workshops will help me in that area… when I graduate I guess it will help me to find a job easily.
> (GATAcademy and other programs, master's student, arts and social science)

Knowledge of being a TA
Learning about the basics of being a TA was raised in many focus groups both as a reason to attend and as an outcome from GATAcademy.

…if you are anxious about well what does being a GA mean, how does it work, who are these people, what is expected.
(GATAcademy and other programs, master's student, arts and social science)

They talked about… certain situations that you don't want to put yourself in or avoid, or how to do [deal] with plagiarism. All of these situations that I wouldn't have even known to ask or think about had they not brought it up so, I knew that doing that for a day would kind of open my eyes to things.
(GATAcademy, master's student, arts and social science)

Understanding the institution's context

International TAs indicated that a major reason for participating in GATAcademy was to find out more about being a TA in Canada. In several cases, the universities in their home countries did not have the TA position or role. However, graduate students who had attended Canadian universities, including those within Ontario, were also interested to see if the role of the TA was different in a new institution.

…it is a whole new system here in Canada. We don't have GA or TA back in China, so I think many of the work that GA and TA do here is done by the teacher itself in China.
(GATAcademy, master's student, engineering)

Yeah, you know, because it is a new university I don't know the new protocols they have here, I wanted to know. Sure, I have been a TA at X (Ontario University) but what does being a TA at Windsor look like, because I don't know it.
(GATAcademy, master's student, arts and social science)

Feeling of competence and confidence

TAs spoke at length of changes in how competent or confident they felt, as well as a decrease in anxiety post-program. The greatest detail about competence came from participants who had attended the long programs in addition to GATAcademy.

I do a tutorial, so I am up in front of the class. Nobody likes to speak in public. But the [Workshop Leaders] were good at what they did and what they were showing us… they were demonstrating just by the way they were presenting their seminar. So you know, I kind of incorporated some of those things in the way I operate in front of the class and it actually made me a lot more calm, like I am not nervous or anything at all.
(GATAcademy, master's student, arts and social science)

I actually felt way more confident on how to explain and how to teach and seeing others and learning from everyone else, that was amazing.
(GATAcademy and long courses, doctoral student, arts and social science)

…the CTL gave you an opportunity to practice some of the skills that you were learning too in a safe environment. So instead of going out there and the first time you are doing it you are doing it in front of your students, you are doing it in front of your peers so everybody was on the same boat so it just made you feel a little bit more comfortable and confident to try that out in the future.
(Long course participant, master's student, nursing)

I think I am more confident using various active learning techniques that I maybe wouldn't have known about, let alone felt confident bringing in into my teaching. As well, I am much more conscious of the feedback I am giving and if it is constructive then giving the students an opportunity to better

themselves rather than you know, just being negative. So I think I just reflect I little bit more on what I am doing and is that the best use of our time.

(Long course participant, master's student, nursing)

Time management and efficiency
TAs with previous experience in teaching raised issues related to time management and efficiency. Learning to balance all of the responsibilities and roles as a student and TA and manage the workload was raised as a particular importance. It is possible that new TAs would not yet have had the experience of trying to balance the workload and so rarely raised the issue.

…in my previous TA experience, I had issues with spending copious amounts of time doing my best, but then my own school work you know, was put to the side and I was spending too much time on this. So I was personally also interested in increasing efficiency whereas I am trying to still maintain that high level, I personally felt I needed to put in…. I am a graduate student, this is my job, except that I have a job to do with my own studies as well, and I think I have achieved more balance.

(GATAcademy, master's student, arts and social science)

I never miss those kinds of events because I know that just by attending you will get something. Like, something related to your work, to learn how to do things better, to optimize your job and be more efficient...

(GATAcademy, doctoral student, engineering)

Teaching skills (general)
Interest in a number of practical general skills for teaching were raised by students, both as a reason for attending GATAcademy and as a result of them discovering skills and methods through participation in the event.

Yes, in the effective explanations, there was a good activity that was done where the facilitator asked everyone to draw a picture of something and to see if everyone drew it much differently… just to be very open minded with the students, not to judge… to be open minded with their understanding of concepts. Not everyone understands things in the same ways, so just to make sure that I am giving examples and allowing the floor to be open to other people in the class, also to comment on the same sorts of issues that are arising in class.

(GATAcademy, master's student, arts and social science)

Technology
Learning to use the technology in the classroom, including the basics of running the classroom audiovisual equipment, was raised by a number of participants as a practical skill they gained from participating. Learning about technology allowed them to mentor other TAs as well as instructors. Several felt that learning basic skills such as these should be mandatory.

Practical things, like how to use the control panel you know to turn on the projector, the lights… if I didn't take that workshop I wouldn't know… that should be mandatory for everyone…. Because I am constantly helping people do it – so that's how useful that is.

(GATAcademy, master's student, arts and social science)

Student engagement

A strong sub-theme raised by TAs was engaging the students in their learning. A number of participants in the focus groups mentioned the style of workshop during GATAcademy as being engaging, which acted as a model for them to use in their future teaching.

> *The people who came to teach all these programs they taught me in a very nice way, like they keep on doing some activities… and then you are really interested…. So even for next time I can go just to see how they behave when they are teaching, that would help me a lot.*
>
> *(GATAcademy, master's student, science)*

> *I learned a number of things about how to give interesting lessons and presentations outside of GA/TA and the workshops that I have taken, like making a presentation that actually presents questions for them to discuss and think about… Rather than just dictating all the information but actually producing questions. And that works really well in terms of engaging students in what you are presenting and getting them to talk and offer their own feedback…*
>
> *(GATAcademy, master's student, arts and social science)*

Facilitating activities, discussions and labs

Further detail about engaging students was related to the role of facilitator including facilitating activities, discussions and labs. TAs felt that they learned important skills and were more prepared to facilitate their teaching activities after taking the programs.

> *So, having that discussion about how to interpret students' questions and students' approach to you. Is not so cut and dry… every time a student comes and interacts with me… I always remind myself to rethink what it is they are actually asking me, rather than just immediately assuming that I know.*
>
> *(GATAcademy, master's student, arts and social science)*

> *I got more than what I expected to get actually… In terms of facilitating discussion in lab, … it was very helpful and the two instructors were very thorough in giving many examples in how to facilitate discussion and I just, I didn't expect to be as involved. They really involved the group a lot and it wasn't just a standing and giving a short seminar on how to do it, it was actually a group involvement. It was actually helpful.*
>
> *(GATAcademy, master's student, arts and social science)*

> *In my lab, we have more like an open discussion with everyone, and I haven't yet used the idea to put them in their own groups, but I think I'll do it in their last lab to see some review sheets. So I am looking forward to, and I am sort of nervous about that, so we'll see how it goes. But maybe next year in the tutorials I'll utilize that method of teaching and learning more.*
>
> *(GATAcademy, master's student, arts and social science)*

Advising students on writing papers and essays

A few students, primarily those in the humanities, indicated that the resources for guiding students in writing papers and essays were an important set of knowledge they gained. TAs commented that the program opened their eyes to the information and support available to students of which they were not previously aware, and which they could use to help their students.

> *I think in general, I found with trying to help my students with writing… that it's impressive the amount of support that is available on campus, but generally students don't know about it.*
>
> *(GATAcademy, master's student, arts and social science)*

Marking

Marking or grading work was also mentioned frequently by focus group participants. It was an area of anxiety for new TAs and it was also one of the main areas that participants from GATAcademy took away practical advice and techniques.

> *I was really nervous about marking papers for the first time, so that's why I went…and learned a lot from it actually.*
>
> *(GATAcademy, master's student, arts and social science)*

> *…what you expect from professor during marking, how to discuss with professor things about the marking, these things helped a lot.*
>
> *(GATAcademy, master's student, science)*

> *I think for me [the most useful piece of learning was]… how to do your marking scheme so that you are consistent throughout,… so students can exactly tell ahead of time what is expected of them and afterwards they can tell 'Oh okay I lost points on this and I can see where I rank among the criteria', I think that is probably a really good tool for me given that I am a hard marker.*
>
> *(GATAcademy and other programs, master's student, arts and social science*)

> *Well there were some good tips regarding marking techniques, especially in my discipline marking papers is usually not just " answer this question yes or no", it's argumentative, interpret stuff so marking can be very difficult. [So the suggestion was to] take the first so many papers that you marked out of your batch, set them aside and go back to them later because you get in the groove of marking and you figure out the base, baseline, median grade and you mark off that once you get going, so the first ones are often not on the same scale that you were marking at later, so that's a really good point that they pointed out. I remember that one, hopefully other people do.*
>
> *(GATAcademy, master's student, arts and social science)*

> *[The sessions] that have been very helpful are marking, learning that you should make a rubric and you should check this with the professor before you grade all of it so you don't waste the time, and have to re-grade and if other people are grading you should also grade the first couple with them to make sure that you guys are being consistent. Strategies to make the grading process much more efficient and prevent unfair grading.*
>
> *(GATAcademy, master's student, arts and social science)*

Plagiarism

Plagiarism was raised as part of a list of issues about which TAs were concerned. A session on plagiarism helped TAs to identify and respond appropriately.

> *…this will be my sixth semester doing it but I still know that there is so much that I can learn in terms of explaining things to people. I took the plagiarism [workshop] and plagiarism may not always be easy to detect but, just taking these sessions just helps.*
>
> *(GATAcademy, doctoral student, arts and social science)*

Planning and design

Some of the workshops in GATAcademy introduced ways to plan for teaching in advance. However, the greatest detail about planning was mentioned by participants who undertook the longer programs, including a graduate course on *Course Design for Constructive Alignment*.

It is better to prepare ahead of time rather than have a problem and have to fix it later. I mean like, I know this is a different situation, but I also went to the CLEW [Learning Management System] seminar because I am new to this university, I don't know how to use this at all and I don't want to have a huge problem the night before I am trying to upload all these grades. I rather go and deal with it before, so you know, preventive.

(GATAcademy and other programs, master's student, arts and social science)

…in the second course that I took, we actually created a whole course that you would teach… it's based on making sure that everything is properly aligned, so your learning outcomes are aligned with your syllabus, and the techniques that you are using and that everything is properly aligned. And then you would actually have everything very objective so, your rubrics, we made sample rubrics, we made sample multiple choice questions which of course is not ideal but in many courses that's what you have to do. And you made sure that everything supported the next, so you scaffolded, so you started with lower level learning and built them up from there, instead of expecting at the beginning of the course that they understand….

(GATAcademy and other programs, master's student, nursing)

Resources

Several participants mentioned that one of the valuable things they took away from GATAcademy and other events was knowing who to go to for future help and having resources to refer back to as they need to. This was in addition to the resources they learned about for helping students be successful.

I took away having a place I can go to, to get help. I found that was very useful… you got to see some of the faces of the people who could help you, I found that very useful.

(GATAcademy, master's student)

6.2.2.2 Theme 2: Relationship/communication with instructor

Understanding how to establish an effective relationship with an instructor was an area raised by several TAs. On one level, understanding how to communicate by email professionally was an issue. For more experienced TAs, understanding how to deal with difficult situations and resolve conflicts raised considerable discussion.

There are a number of issues that came up, I mentioned the plagiarism one, another one was knowing the limitations that the teachers who you are working for has with you like, that they can't sort of pile on like a bunch of work that would take 20 hours a week when you are only getting paid like nine hours… so knowing you have that institutional backing to you so you couldn't become like the teacher's slave.

(GATAcademy, master's student, arts and social science)

In a situation where a professor maybe asking you to do a lot and is way above the job of a GA, normally I have just said, okay I will figure it out you know? But if I perhaps had better skills at being able to do, deal with conflict, I might be able to have more of a discussion with that professor and being able to say, you know, this is a little bit too much or I am going to need some extra help…

(GATAcademy and long events, doctoral student, engineering)

6.2.2.3 Theme 3: Peer network

Connecting with and learning from peers was mentioned throughout the focus groups. It was one of the most identified reasons for attending and one of the greatest benefits. Additionally, several TAs mentioned that they then took the information back to their peer network in the department for those who did not attend. It created an opportunity for support for those who did not have departmental support for teaching.

> *The highlight of my experience was more related to the feeling, like to that environment being a very safe environment to ask questions and participate and just connect with other people who could be having the same difficulties.*
>
> *(GATAcademy and long courses, doctoral student, arts and social science)*

> *Yeah, and I think too, there weren't many people from my department that came, maybe one, so it's nice to be with people who are interested in learning this too when you come from a department that maybe does not have a lot of people who are participating in this kind of thing so, I like that kind of community aspect to it as well.*
>
> *(GATAcademy and long events, doctoral student, engineering)*

> *And also like I felt, there was me and another grad from my department, but it was like we were able to filter the information to the other people who didn't come.*
>
> *(GATAcademy, master's student, arts and social science)*

6.2.2.4 Theme 4: Intrinsic motivation

The intrinsic desire to be the best TA and to help students learn was also a frequent theme. Participants expressed a sense of duty, the desire to help and the goal of self-improvement. There was a clear sense of responsibility for the learning of students as well.

> *I personally felt that by going I could optimize my teaching so that I could be the best teacher I could be for my students. I feel like is my duty to them to do my best.*
>
> *(GATAcademy, master's student, arts and social science)*

> *I think just wanting to be a good GA, being able to help students effectively.*
>
> *(GATAcademy and long courses, doctoral student, engineering)*

> *…an opportunity to better themselves…. A lot of us teach so you know there are always areas for improvement, there's things that I probably do very well there is things that I can definitely improve on.*
>
> *(GATAcademy and long courses, master's student, nursing)*

6.2.2.5 Theme 5: Professionalism, communication and relationships with students

A number of issues were raised related to communicating effectively with students, including face-to-face and virtual communications. Further, understanding and negotiating the boundaries of relationships between TAs and students was an area of discussion.

> *Oh, I really liked the cyber communication. About how you are supposed to address the students I think in emails, and what to expect in return from the students themselves.*
>
> *(GATAcademy, doctoral student, arts and social science)*

There was also another discussion [that] brought up the social interaction that we have with undergrads… where I have never been in this situation where there is some kind of a power dynamic you know? So, it made me conscious of that…. and for me I just interact with people like people, I don't see that kind of hierarchy. But there is a power dynamic in terms of like grading and the legitimacy and all that kind of stuff and you don't want to be giving A's to your friends and… it really made me open my eyes to that and made me more aware.

(GATAcademy, master's student, arts and social science)

For me, like specifically the GATAcademy it was that they emphasized a lot the respect for the students as people and to not judge them if they did something that's not that bright.

(GATAcademy and long courses, doctoral student, arts and social science)

Rules and regulations

Other areas of interest were the rules and regulations that govern interactions with students.

But if you are a new GA and you don't know that you know, there are certain rules and regulations, you could be taken advantage of, or, the professor might not be following protocol for the class and then the students suffer.

(GATAcademy, master's student, arts and social science)

7. Discussion

7.1 Summary of Findings

The goal of the study was to compare the impact of short and long teaching development programs and examine how participants use what they learn in each type of program. During the analysis, interesting patterns of program impact emerged, with some commonalities and a few differences between the two institutions.

The findings provide evidence that teaching development programs help improve the teaching effectiveness of new teaching assistants in a variety of ways. TAs felt better prepared for their role as instructors after participating in training. Both short and long programs contributed to increased teaching self-efficacy and to an increase in student-focused approaches to teaching. Based on the examples described in the focus groups, we found that when TAs began to teach on their own, they were able to apply the teaching techniques, course design principles and student-focused approaches to teaching that they learned in TA training programs. There was variation in how learning from these programs was used by TAs and we address these patterns below.

At Western, the teaching self-efficacy of TAs increased for all participants from the beginning to the end of the programs on most of the self-efficacy domains we explored. Specifically, TAs, regardless of program, felt more confident in their ability to interact with students after the program than before. Also, both short and long program participants improved in their confidence writing teaching-related materials (e.g., exam questions, course syllabi) and a trend suggests a similar impact on their confidence in engaging in teaching improvement. In both domains, the long program participants felt more confident than their colleagues in the short programs. This increase in teaching self-efficacy is supported by the focus group interviews, in which TAs gave concrete examples of the ways in which they asked for and incorporated feedback on their teaching, and adjusted their teaching approach to accommodate student needs mid-class. The patterns of

increased teaching self-efficacy observed here are consistent with previous research on intensive TA training programs (Boman, 2008; Komarraju, 2008). An increase in self-efficacy after TA training was observed both with Canadian and international TAs in this study, and in previous research (Boman, 2013; Dawson et al., 2013). Similarly, both the short and long programs appeared to increase TAs' overall confidence in their ability to perform their TA duties and increased their preparedness for teaching. Perhaps not surprisingly given their level of previous teaching experience, the long program participants felt more prepared for teaching than their short program peers.

At Windsor, there was no quantitative evidence of the programs having an impact on TA self-efficacy, although in focus interviews, short program participants talked about feeling more confident and more prepared for their TA roles. The fact that the increase in confidence that TAs discussed in the focus groups was not apparent in the survey data is most likely because we were not able to conduct within-person analysis of survey data on the Windsor sample. Overall, the long program participants felt more prepared for teaching than their control group colleagues, and there was a trend suggesting they may also have felt more prepared than the participants in the short program. This may be the result of the previous teaching experience that long program participants had compared to the other two groups (as outlined in Table 4 in Section 5.2.2).

The findings for TAs' self-reported approaches to teaching were markedly different for the two institutions. At Western, the short program participants' teacher-focused approach to teaching increased, whereas the long program participants' teacher-focused approach did not change from the beginning to the end of the program. An increase in teacher focus as a result of training in the short program may at first seem surprising, but this pattern is consistent with developmental models of teaching assistant development (e.g., Nyquist & Sprague, 1992) and with the Stages of Concern Model of TA development (Ferzli, Morant, Honeycutt, Warren, Fenn & Burns-Williams, 2012). Both of these models suggest that at the beginning of their teaching careers new TAs are first concerned with content delivery and are task- and self-focused, before gradually shifting to a stage where they demonstrate a greater degree of concern for the impact of their teaching strategies on students and student learning. The focus on delivery and classroom management that new TAs in our study observed in the short, one-day conference on teaching may have contributed to an emphasis on teacher-focus, as many of the topics addressed in the program emphasize the role of the teacher in the classroom. As a result, participants may have entered the program with an undifferentiated conception of teaching (Cassidy & Ahmad, forthcoming), and then during the course of the program they developed an initial, teacher-focused approach that is characteristic of early-career instructors.

On the ATI-R, the Teacher-Focused/Information Transmission and Conceptual Change/Student-Focused scales are independent from each other, and an increase in scores on one scale does not necessarily lead to a decrease in scores on the other. The questionnaire asks survey respondents to think about a concrete teaching context (i.e., specific course) and describe their approach to teaching in that context. Before they gain teaching experience or participate in training, new teachers may initially describe themselves as very student-focused, but after participating in training, learning about a variety of teaching approaches and, importantly, trying them out in their own classroom, they are likely to develop a more realistic perception of their own teaching approach that is perhaps lower on student focus. This pattern was observed in a study with faculty members, in which Postareff, Lindblom-Ylänne and Nevgi (2007) found that new faculty with no training rated themselves higher on student focus than new faculty who participated in some training, but less than a year of training. That the ITTF and CCSF scales are independent also means that the early phases of teacher development training may result in an increase in teachers' ITTF and CCSF scores at the same time. We observed this pattern in the Western sample here.

In the Western sample, participants' student-focused approach to teaching increased over the course of both programs but, overall, the short program participants were more student-focused than their long program peers. Short program participants, in general, were younger and had less teaching experience than long program participants. The fact that most have very recently completed their undergraduate education is likely to make them acutely aware of student needs and focus them on those needs.

The increase in student-focused teaching approaches among Western TAs was mirrored by the focus group findings as well. TAs cited a number of concrete examples of the ways in which they worked to make learning relevant to students, to accommodate students with a variety of learning styles, to engage undergraduates using a variety of discussion techniques and to seek feedback on whether students learned what the TAs intended to teach.

At Windsor, there were no substantive differences in the TAs' approaches to teaching that might be attributed to the programs. Long program participants tended to be more student-focused in their teaching than the control group participants, but further research with more participants with matched scores is needed. The discrepancy in the findings between the two institutions may be the result of the differences between the two samples. At Western, we had an adequate number of participants in the long and short programs complete both the Time 1 and 2 surveys that we were able to compare each participant's responses across the two times to determine the individual impact of the program. Unfortunately, at Windsor we did not have a large enough number of participants who completed both surveys to allow these within-participant comparisons. This introduced the possibility that differences between the Time 1 and 2 survey responses may be the results of differences between the two groups and not the programs. It may also be possible that the individual differences may have suppressed possible effects.

In the focus group interviews, there was great similarity between the themes and examples of learning cited by TAs at the two institutions, indicating that the learning outcomes of the various programs are likely to be similar. The majority of Windsor focus group participants were short program participants, while Western had a similar number of short and long program participants in the focus group, and so were able to compare the impact of long and short programs in greater detail.

The motivations of TAs to attend the programs were very similar, including practical and concrete knowledge and skills such as finding out about the roles of being a TA, finding out about institutional context and using different ways to engage students. A number of TAs at both institutions were interested in opportunities for social interaction and developing peer networks. One difference was that TAs from Windsor who attended the short program as well as long programs were interested in career development, while TAs from Western's short programs did not identify this as a motivator, only those in the long program.

Based on the focus group interviews, several key differences emerged between the types of learning that participants took with them from short and long programs. When describing what they learned in the program, short program participants emphasized concrete teaching techniques for facilitating discussions, marking, asking effective questions and becoming more familiar with expectations for the teaching assistant role. Long program participants demonstrated greater confidence in using principles of course design and alignment, articulating learning outcomes and demonstrated a greater depth of reflection on teaching. At both institutions, participants appreciated that the facilitators and leaders modeled engaging methods. Also, there was an increase in confidence and a sense of competence as a result of having methods, knowing they were not alone and having opportunities to practice.

Long programs had a greater impact on teaching and learning at both universities. First, long programs had a wide impact on teaching and learning at the university that went beyond the teaching practice of the

individuals who participated. Long programs created communities of TAs from a variety of disciplines, in which dialogue about teaching continued beyond the end of the program. Second, long programs inspired teaching innovation beyond the course, when participants returned to their departments and shared innovative teaching techniques or course design strategies with their peers and with faculty members. The impact widened when faculty encouraged and allowed long program participants to help re-design a course or incorporate a new, innovative assessment in their course. Third, long programs make a substantial contribution to the preparation of future faculty. The majority of long program participants were preparing for faculty careers. They chose to participate in teaching development strategically to prepare for the job search and prepare for the first few years of independent teaching as faculty members. The findings showing greater impact for long programs compared to short programs is consistent with recent findings (Rolheiser et al., 2013) and with previous studies that examined longer faculty development programs (such as Gibbs & Coffey, 2004) and looked at previous experience of TAs (Shannon, Twale & Moore, 1998).

7.2 Implications

Teaching development programs for graduate students have had a positive impact at both institutions in four main areas: (1) TA programs can enhance undergraduate learning through increasing the student-focused learning approaches TAs use in their teaching, (2) programs benefit participants in their broader role as graduate students, which could contribute to successful completion of their degrees by helping them to develop confidence in their presentation, interpersonal communication, and organizational skills, (3) longer teaching development programs make an important contribution to the development of future faculty by engaging graduate students in reflective practice and by encouraging them to seek feedback on their teaching performance from the very beginning of their teaching careers, and (4) teaching development programs provided opportunities for networking and for collaboration across departments that contributed to a dialogue about teaching innovation and teaching excellence across campus.

TAs in both short and long programs felt that participating in training was well worth the time, effort and cost involved, because teaching development programs contributed to their career development and allowed them to perform their TA duties "at their best." Institutions that consider implementing new teaching development programs for graduate students may ask whether short or long programs will have greater impact on the culture of teaching excellence at their institutions. Based on our findings, both programs make an important contribution – but do so in different ways. Short programs serve as a gateway to further teaching development and allow new graduate students to learn a few very practical teaching strategies and better understand what they may gain from further training. Longer programs allow participants to build community and strategically prepare for careers in teaching, whether inside or outside academia. Given current levels of funding at our institutions, shorter programs can reach larger numbers of new TAs, while longer programs can accommodate smaller numbers of graduate students because they are high-touch, small group-based workshops, but these long programs have greater impact on self-efficacy, approach to teaching and reported teaching practice.

New graduate students need to know what they will gain from each type of teaching development program in which they participate. Therefore, it is important for teaching centres and departments to articulate clearly the differences between the outcomes of orientation-style and more in-depth programs in program descriptions and advertising. Clearly articulated program outcomes will enable both participating students and their faculty supervisors to have a clear understanding of the substantial benefits that spending 20 or 40 hours on a teaching workshop may have for the TAs. A few centres have already begun to identify programs by their levels of impact (introductory, intermediate or advanced), or articulated the types of instructors a program benefits most, depending on the level of independence of their teaching role (i.e., marking TAs, tutorial leaders, or grad students teaching their own course).

During focus group discussions, participants emphasized how much they learned from observing facilitators during teaching development sessions. Educational developers, faculty members and senior graduate students who help facilitate TA training sessions need to ensure they model best practices in facilitation, feedback and active learning – and engage new TAs in a meta-level discussion of the facilitation strategies they use when they lead teaching development workshops. This may include incorporating time for reflection on how participants experienced learning activities in the workshop, or a discussion of how a workshop may be re-designed for participants with difference levels of prior knowledge. It is especially important to encourage modeling among guest presenters and faculty who contribute to TA orientation events but who may not be trained in facilitation.

7.3 Limitations

A potential limitation of the current research is that the graduate students in this research self-selected to take part in both of the programs under investigation (except for the control group participants) and the study. Their willingness to participate in these programs and the research project may be the result of characteristics that they possess which may not be common to graduate students more generally. This self-selection may limit the generalizability of our findings beyond these particular participants.

Another limitation of this research is the small number of participants from the long programs. Although the research response rates were reasonable for most of the programs under investigation, enrolment in the large programs was restricted to relatively small numbers, which is problematic for research of this nature. With such a small sample size it is possible that there was inadequate power to detect the statistical significance of any small but meaningful effects. Future research with a larger sample of large program participants is necessary to support these findings.

Similarly, the small numbers of participants who completed both the Time 1 and 2 surveys, particularly at Windsor, is a limitation of the current research. With the Windsor participants, the number of respondents who completed both Time 1 and 2 surveys was too small to allow comparisons of the same participants across the two surveys (i.e., within-participants comparisons). Thus, comparisons were made between largely different participants at Time 1 and 2 (i.e., between-participants comparisons), which confounds whether any effects might have been due to differences between the individuals in the two groups, the programs or the passage of time. It is also possible that the differences between participants may have suppressed possible effects of the programs.

7.4 Future Research

In this section we address (1) lessons learned from the study that may impact research design for future research on program impact, and (2) questions and directions for further research on program impact.

7.4.1 Lessons Learned for Future Research Design

Participant recruitment. Paper surveys received a much higher response rate than online surveys. Whenever possible, participants need to be invited to participate in research by someone they are familiar with, but who is not in a position of power over them. There was a substantial difference between the types of recruitment strategies at the two universities, and some of these limitations stifled recruitment and participation. A shift to paper surveys (with permission from our research ethics offices) helped increase the response rate, as well as the ability (at Western) to speak to several hundred new graduate students at a general graduate orientation session one day prior to TA Day.

Data collection and analysis. The differences between the types of analyses we were able to conduct at the two institutions clearly emphasize the need for conducting within-person analyses when we examine program impact. Several strategies may facilitate getting matched datasets from the same individuals before and after the program. (1) Using personal identifiers that remain constant. In this study, participants were identified by a personal code number that they selected, with two letters of their last name, two numbers from their birthdate and two digits of their phone number. In the Windsor sample, the identifiers changed for enough participants that this interfered with our ability to match their pre and post data. (2) Compare participants to a sufficiently large control group. In this study the number of control groups participating in both Time 1 and 2 surveys did not allow for a within-person analysis. The greatest challenge was recruiting control participants. It has been suggested that future studies may invite participants on waiting lists for TA development programs to fill out surveys as the control group. (3) Use survey instruments that capture the developmental starting point of novice teachers better and allow them to reflect on how they might teach without familiarity with the language of teaching. Because they cannot ground their responses in previous teaching experience, novice TAs find it difficult to articulate their approach to teaching. The ATI-R may be better suited to assess long program impact looking at change in approach, while in short programs the impact centers around skills, information, where to find information and how to use techniques. Information about what was learned in the short programs was better reflected in the focus group discussions and may also be captured better by a different survey instrument designed especially for novice teachers. Alternatively, a pre-then-post approach may be used to assess this developmental stage instead – see the Future Research section below for more information on this method.

7.4.2. Directions for Future Research

Future research needs to explore long-term changes in teaching assistants' approaches to teaching after training, as well as the impact of TA training on student learning. Assessing the impact of teaching development on the student experience has been challenging (Stes et al., 2010), but a few studies have begun to explore the connection between student-focused approaches to teaching and deep learning using with the ATI-R (Gibbs & Coffey, 2004; Trigwell, Prosser & Waterhouse, 1999). Future research may complement the self-report measures of teaching approaches used here with observer ratings of TA teaching in real classroom settings and with student ratings of TA teaching, as well as measure of student learning before and after training. The impact of teaching development programs is often long-term, particularly in long programs (Trigwell, Caballero Rodriguez & Han 2012; Stes, Clement & Van Petegem, 2007). TAs become reflective teachers whose teaching approaches continue to evolve over time. A longitudinal study may explore the impact of TA teaching development one to two years out, using video-recorded classroom observations of TA teaching. The developmental path of TA teaching could also be examined by theme analyzing TAs' changing teaching philosophies, or changes in their reflections on teaching through their teaching journals. In the case of doctoral students who participate in TA development during their first year, this approach may provide us with a four- to five-year sample of their evolution as teachers and may continue into the first few years of their development as new faculty.

A second approach to explore TAs' conceptions of teaching more accurately would be to replicate the study using a pre-post-then design. Cassidy and Ahmad (forthcoming) argue that in their early stages of teacher development, TAs may have an undifferentiated conception of teaching, and with no prior teaching experience, it is very difficult for them to describe their teaching practices on the ATI-R. A pre-post-then design would allow us draw on TAs' ability to reflect on their own development and ask them to rate their perception of the change (e.g., self-efficacy) that took place as a result of training. In a pre-post-then design, after the pre and post tests, participants are asked to fill out a third set of surveys in which they look back and rate, for example, what they think their self-efficacy was before the program, after the program and at a third

point in time after the program. Another alternative, which requires less participant time is a post-then-pre design. Participants answer only one survey at the end of the intervention or program, where they self-report their current understanding, and their original understanding. This method is effective in avoiding response-shift bias when the intervention changes the basis for answering the questions, and reduces the survey fatigue for participants, though it does have the limitations associated with self-report (Howard, 1980; Skeff, Stratos & Bergen, 1992).

8. Conclusions

The study provides concrete evidence that both short and long teaching development programs have a positive impact on teaching assistants' preparedness for teaching and their ability to promote student engagement and facilitate learning effectively. Short and long TA training programs address the varying needs of TAs at different stages of their development as teachers. Short programs address the needs of novice teachers with little or no previous teaching experience, whereas long programs tend to address the needs of TAs with some teaching experience at advanced stages of TA development (Nyquist & Sprague, 1992).

The role of short, concrete, teaching strategy-focused, orientation-style programs is to help clarify expectations for the TA role, alleviate TAs' initial anxiety about teaching and to provide a set of concrete tools that serve as survival skills for the first few months of the new teacher's assignment. These are the types of knowledge novice TAs seek and take away from orientation-style TA development programs. Short programs also serve as a gateway to further teaching development: they introduce new TAs to extended programs and resources, and encourage new TAs to reflect and seek feedback on their teaching and through role models (e.g., faculty, educational developers and peers presenting in these programs). They also introduce new TAs to the competencies they may develop if they continue to engage in teaching development throughout their careers. The majority of TAs participate in these short, early career programs on their own initiative, but a significant number are required to attend by their home departments (Robinson, 2011).

Longer programs tend to serve two groups of teaching assistants. The first group includes more experienced TAs who are beginning to develop greater independence as teachers and are looking for teaching tools and approaches that will enable them to design or teach courses independently. The second group tends to include TAs who are interested in a teaching career but have not had a lot of opportunity to teach independently in their home department. These TAs enrol in the long program to gain hands-on teaching experience through microteaching or to build their teaching dossier for the academic job search. The decision to participate in teaching development is strategic for both groups, and both groups seek teaching development on their own initiative. Long programs often engage participants in the analysis and discussion of their own teaching experiences, and as a result TAs with some teaching experience are both able to contribute more to the dialogue and gain more from participating in these programs. Intensive, later-stage teaching development programs are an important stepping stone for new instructors on the path to the professoriate, and it has been suggested that teaching and professional development programs that "align well with the competencies developed by successful junior faculty have the most positive impact" on the professional development of young scholars as teachers (Palmer, 2011, p. 12).

9. References

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