

Does Reflective Writing Enhance Training? An Evaluation of a Skills-Based Teaching Assistant Training Program

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Abstract:

The need for empirical research that assesses the outcomes of teaching development programs for graduate students is increasingly recognized. The current study investigated the effectiveness of a skills-based teaching assistant (TA) training program for novice TAs. In addition, a second objective was to assess whether the addition of reflective writing activities to the regular program led to larger gains in outcomes. Results indicated that overall TAs improved the frequency of effective teaching behaviours across the program but showed no changes in their intentions to engage in further professional development. No differences in teaching behaviours were observed between TAs who did or did not complete the reflective writing component of training. Despite no observed differences in teaching behaviours between groups, analysis of TAs' written reflections indicated that student engagement was mentioned more frequently by TAs at the end versus the beginning of training. TAs identified that they had learned specific skills related to pacing of instruction, organization and clarity of content, communication behaviours, and student engagement, as well as learned the value of confidence and practice. One implication of the results is to consider how further programming for TAs can build on these initial teaching outcomes.

Key Words:

Teaching assistants; teaching assistant training; graduate student teaching development; evaluation, reflection.

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Introduction

The need to foster and develop graduate students' teaching competence is increasingly recognized as an important issue in graduate education (Austin, 2002; Austin & Wulff, 2004). Graduate students are frequently called upon to assist with classroom instruction in their roles as teaching assistants (TAs) and often take on sole responsibility for teaching undergraduate courses (e.g., Meyers & Prieto, 2000). While graduate students have content expertise in their disciplines, they may not know how to translate their expertise into learning experiences for students. Indeed, previous research has indicated that many graduate students recognize a lack of preparation for their teaching roles, both as TAs and as future faculty members (Austin, 2002; Golde & Dore, 2001; Meyers, Reid, & Quina, 1998). Given the role that graduate students play in the provision of quality undergraduate education, it is essential that they have the necessary teaching skills to carry out their teaching responsibilities. Although graduate student teaching programs have been developed to meet this need, further research is necessary to determine what impact these opportunities have on graduate students' teaching development.

Research on Graduate Student Teaching Programs

Currently, a wide range of programming opportunities in teaching exist for graduate students at North American universities (Bellows, 2008; Korpan, 2011; Piccinin, Farquharson, & Mihu, 1993). Examples include half-day orientations to the TA role, monthly workshops, and semester or year long graduate courses on the theory and practice of university teaching. More recently, certificate programs designed to support TAs at various stages of their graduate careers have emerged as a more systematic approach to teaching development (Bellows, 2008; Korpan, 2001; Schönwetter, Ellis, Nazarko, & Taylor, 2004). The different program types may include a wide range of activities to support teaching, such as microteaching (i.e., brief teaching sessions that are delivered for the purpose of feedback), direct instruction in educational methods and theory, reflective exercises such as the development of a teaching philosophy, and instruction in course design. While a diverse range of opportunities to help prepare graduate students for their teaching roles have now been developed and implemented, the effectiveness of many of these programs has not been documented.

Until recent years, there was very little rigorous or systematic evaluation of teaching programs for TAs and graduate students (Chism, 1998; Weimer & Lenze, 1997). When program evaluation did occur, outcomes were often limited to satisfaction ratings by participants (Chism, 1998). Recent examples of evaluations in the literature have included a broader spectrum of program outcomes. For example, training has been associated with increases in TA self-efficacy (Boman, 2013; Dawson, Dimitrov, Meadows, Olsen, 2013; Dimitrov et al., 2013; Komaraju, 2008), increases in overall preparedness for teaching roles (Dimitrov et al., 2013; Taylor, Schönwetter, Ellis, & Roberts, 2008), and decreases in communication apprehension (Boman, 2013; Dawson et al., 2013). Research has also suggested changes in teaching behaviours (Boman, 2013; D'Eon, 2004; Dawson et al., 2013; LeGros & Faez, 2012), and development of specific knowledge and skills (Taylor et al., 2008). These evaluations represent an

attempt to better understand and articulate the impact of specific types of programs on graduate student teaching development.

One type of training program that holds considerable promise for use with graduate students in the early stages of teaching development is a skills-based workshop. Such workshops may include information about effective teaching practices coupled with opportunities to practice teaching skills through microteaching activities. One goal behind these workshops is to offer TAs some initial, concrete skills with which to begin their teaching assistantships. Previous research has shown that even brief interventions of this nature can impact novice teachers' confidence in performing a variety of teaching behaviours (Crowe, Harris, & Ham, 2000; Komarraju, 2008; Salina, Kozuh, & Seraphine, 1999), as well as improve specific teaching skills (Boman, 2013; D'Eon, 2004; Dunnington & Da Rosa, 1998). Social-cognitive learning theory (Bandura, 1986) offers some explanation for these outcomes in that these types of programs provide opportunities for vicarious learning (through the modeling of effective teaching by instructors and other participants), direct practice and feedback (leading to mastery experiences), and social support. This type of training may be particularly useful in the early stages of TA development where there is a focus on acquiring 'survival skills' (Nyquist & Sprague, 1998) to help novice instructors cope with beginning teaching experiences.

Reflection on Teaching

While initial research shows a positive impact of skills-based training on teaching behaviours, little research has examined the role of reflective processes in these types of programs for novice TAs. Reflection is a common activity in teacher education programs (e.g., Davis, 2006; Hatton & Smith, 1995) and is viewed as beneficial to teachers' professional growth and practice (e.g., Alpine & Weston, 2000; Kagan, 1992; Pinsky, Monson, & Irby, 1998). While many different models of reflection are used within teacher education (e.g., Dewey, 1933; Schön, 1983; 1987), one frequently used definition is evaluating one's experiences and learning from them (Boud, Keogh, & Walker, 1985). Similar to many models of reflection, this definition presumes that a starting place for reflection is an experience upon which to reflect. While microteaching episodes in skills-based TA training programs are often brief, they could provide such an opportunity for more formal reflection and learning.

Self-reflection is a key component of self-regulated learning (Zimmerman, 1998; 2001; 2002). In theories of self-regulation, learning is viewed as a self-directed process that involves motivational, behavioural, and metacognitive processes (Zimmerman, 1998; 2001; 2002). Learning is prompted by cyclical activity in three phases: forethought (i.e., processes and beliefs that set the stage for learning such as goal setting), performance or volitional control (i.e., processes that occur during learning such as self-monitoring), and reflection (i.e., processes that occur after learning and affect learner's reactions to the experience) (Zimmerman, 1998, 2001, 2002). Within this model, Zimmerman (1998, 2001, 2002) suggests that self-reflection may include elements such as evaluating one's performance in comparison with a standard, making attributions for success and failure, and adapting one's performance in the future by identifying where errors occurred and correcting them. Research has demonstrated that

helping students engage in self-regulation (e.g., identifying reasons for performance, reflecting on which behaviours led to achievement of goals, developing future strategies) can positively impact learning and performance (e.g., Masui & De Carte, 2005, Ryder, 2002). Given the value of self-regulated learning, it would be useful to understand whether reflective activities that support self-regulation would help TAs enhance their performance in a skills-based training program.

Objectives of the Current Research

There were three key objectives of the current research. The first objective was to provide further evidence of the impact of a skills-based TA training program on teaching performance. In particular, it was hypothesized that TAs would show increases in frequency of specific teaching behaviours and ratings of teaching effectiveness as measured by self-ratings and observer-ratings, as well as show increases in intentions to engage in further professional development activities. The second objective was to assess whether the addition of a reflective writing exercise to the program had a measurable impact on these outcomes beyond the regular training program. It was hypothesized that the articulation of goals and strategies with respect to teaching performance would increase the frequency and effectiveness of specific teaching behaviours as well as increase participants' intentions to seek out future professional development. Finally, a third goal of the research was to further understand TAs' teaching development and experiences during training through analysis of their written reflections. It was anticipated that TAs' reflections would provide additional information on their learning, such as factors that help or hinder their teaching development, which may not be captured by behavioural measures.

Method

Design

The study incorporated elements of a pretest/posttest design and a non-equivalent control group design. Six sessions of a TA training program were included in this research and three of these sessions were randomly assigned to include reflective writing exercises during training. All other elements of the program remained the same.

Participants

Participants included a total of 124 graduate students who participated in one of six sessions of a TA training program over a two month period at a large Canadian university. The three sessions designated as regular program sessions included 58 participants (Group 1) and the three sessions with the addition of reflective writing components included 66 participants (Group 2). Complete pretest and posttest questionnaires were available for 39 participants in Group 1 and 54 participants in Group 2 and complete video recordings were available for 36 participants in Group 1 and 51 participants in Group 2. In the reflective writing group, 61 of the 66 participants completed reflective journals. Reasons for missing data included the absence of a participant during the data collection and recording problems (e.g., sound difficulties).

Participant characteristics. The mean age of participants was 26.41 ($SD = 5.06$) and the sample included a similar proportion of males and females (46.34% and

53.66%, respectively). The majority of participants were in their first year of a master program (58.87%) or doctoral program (21.77%) and had been a teaching assistant for less than two terms (81.45%). In regards to international student status, 66.94% of the sample identified as Canadian TAs and 33.06% identified as International TAs. Participants were from 50 different academic departments on campus which represented a diverse range of disciplines.

Description of the Training Program

The program evaluated here is a 2 ½ day teaching program (constituting 20 hours of training time) that is open to all graduate students on campus. It is a voluntary program and is geared especially toward newer TAs. The main activities of the program include interactive sessions regarding effective teaching practices and two microteaching sessions where TAs prepare a 10 minute class and teach it to a small group of fellow participants and a workshop facilitator. The interactive sessions help prepare TAs for the microteaching experience through discussion of topics such as organizing and presenting information, using visual aids, and giving and receiving feedback. During the microteaching sessions, TAs receive immediate feedback on their teaching from their peers and the facilitator and are provided with digital recordings of their microteaching sessions. TAs also receive a handbook that provides a summary of the information presented during the interactive sessions and references to further resources on campus.

Measures and Materials

Professional Development Intentions. A three item self-report measure that assessed participants' intentions to engage in future professional development was developed for use in this study. The items were: 1) *I plan to participate in teaching improvement activities this year (e.g., workshops);* 2) *I am interested in learning more about teaching strategies and how to improve my teaching;* and 3) *I intend to look for more opportunities to be involved in TA training activities.* Participants rated each item on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The minimum inter-item correlation was $r = .66$ indicating strong relationships among items and, consequently, the total scale score was used in the following analyses.

Teacher Behaviours Inventory (TBI-A). An abbreviated 15-item version of Murray's (1983) Teacher Behaviour Inventory was used by participants (self-ratings) and by trained raters (observer-ratings) to evaluate the microteaching sessions. The instrument requires respondents to rate the frequency of 14 specific, low inference teaching behaviours that are correlated with effective teaching (e.g., "signals transitions from one topic to the next," "speaks in a dramatic or expressive way") on a 5-point scale (1 = *almost never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *almost always*). These 14 items were summed to create an overall frequency of effective teaching behaviours score. The final item of the scale is a single item that rates overall teaching effectiveness from one to five (responses in half-point increments were allowed on this single-item scale).

Three observers completed 12 hours of training to code digital recordings of microteaching sessions using this instrument. Once the three observers reached adequate inter-rater reliability on a sample of microteaching videos, one of the trained

observers coded the data set for the current study. The observer was blind to whether each recording was a participant's first or second microteaching episode. Inter-rater reliability was then conducted on a random sample of 20% of the digital recordings. Inter-rater reliability was $r = .88$ for frequency of behaviours and $r = .76$ for the overall effectiveness item.

Reflective Writing Prompts. Five reflective writing prompts that asked TAs to reflect on various aspects of their teaching experiences during the program were developed for use in this study.

1. *What was your goal for your microteaching session?*
2. *To what extent do you feel you reached your goal? What factors helped you to reach your goal or prevented you from reaching your goal?*
3. *What was the most important lesson you learned from this teaching experience?*
4. *How can you approach your teaching differently next time?*
5. *What do you need to help you reach your next teaching goal?*

Procedure

At the start of all six sessions of training, participants were administered the Professional Development Intentions scale and were asked to provide basic demographic information such as gender, age, student status, department, and teaching experience. The Professional Development Intentions Scale was administered again at the conclusion of the program. On the second and third days of the training program, TAs presented microteaching sessions (one per day) that were digitally recorded. Their self-ratings of teaching effectiveness were completed immediately following the microteaching sessions. In addition, in the three sessions of training that included reflective writing, participants were given 25 minutes after each microteaching session to complete reflective writing exercises using the reflective writing prompts. Observers coded the microteaching recordings following the conclusion of the program.

Results

Quantitative Analyses

To assess the overall effectiveness of the program, a 2-factor mixed model analysis of variance (ANOVA) was conducted on the following variables: professional development intentions, self-rated and observer-rated frequency of behaviours, and self-rated and observer-rated teaching effectiveness. The within-subjects variable (time) was the measurement of the dependent variables at Time 1 and Time 2. The between-subjects variable (group) was whether the participant had participated in the regular training program or the program with an added reflective component. Please see Table 1 for the ANOVA results. No interactions were significant and are not reported in the table.

Table 1. ANOVA results for all dependent variables.

| Dependent Variable | Time | Group |
|---|--|---|
| Professional Development Intentions | <i>ns</i> | <i>ns</i> |
| Self-rated Frequency of Teaching Behaviours | $F(1, 89) = 54.52$ $p < .001, \eta_p^2 = 0.380$ | $F(1, 89) = 4.33$ $p = .040, \eta_p^2 = 0.046$ |
| Self-rating of Teaching Effectiveness | $F(1, 86) = 7.47$ $p = .008, \eta_p^2 = 0.080$ | $F(1, 86) = 4.16$ $p < .001, \eta_p^2 = 0.984$ |
| Observer-rated Frequency of Teaching Behaviours | $F(1, 84) = 18.89$ $p < .001, \eta_p^2 = 1.84$ | <i>ns</i> |
| Observer-rating of Teaching Behaviours | $F(1, 85) = 6.15$ $p = .015, \eta_p^2 = 0.067$ | <i>ns</i> |

Only significant results will be described here.

Self-ratings of teaching. With respect to self-ratings of frequency of teaching behaviours, there was a significant main effect for time with higher ratings at Time 2 ($M = 56.17$, $SE = 0.61$) than Time 1 ($M = 52.65$, $SE = 0.64$). There was also a significant main effect for group with higher ratings in the reflective condition ($M = 55.62$, $SE = 0.75$) than the control condition ($M = 53.20$, $SE = 0.89$) but there was no significant interaction with time. For self-ratings of teaching effectiveness, there was a significant main effect for time with higher ratings at Time 2 ($M = 4.00$, $SE = 0.06$) than Time 1 ($M = 3.88$, $SE = 0.06$). There was also a significant main effect for group with higher ratings in the reflective condition ($M = 4.05$, $SE = 0.07$) than the control condition ($M = 3.83$, $SE = 0.08$) but there was no significant interaction with time.

Observer-ratings of teaching. With respect to observer-ratings of frequency of teaching behaviours, there was a significant main effect for time with higher ratings at Time 2 ($M = 51.13$, $SE = 0.68$) than Time 1 ($M = 48.53$, $SE = 0.85$). For observer-ratings of teaching effectiveness, there was a significant main effect for time with higher ratings at Time 2 ($M = 3.94$, $SE = 0.06$) than Time 1 ($M = 3.83$, $SE = 0.08$).

Qualitative Analyses

The researcher and two research assistants independently reviewed the reflective writing samples and created thematic categories that described the responses to each reflective prompt. Once the final categories were agreed upon, the writing samples were coded independently by three coders using the shared categories. Coders placed thematic units into the same category over 90% of the time. Disagreements were resolved through consensus.

Goals for the Microteaching Sessions. On average, participants mentioned 1.5 goals for the first microteaching session and 1.3 goals for the second session. The

same five themes emerged in both the first and second writing samples and are described below.

Content Objective. Many participants described a teaching goal that was related to the topic or content of their presentation. For example, in the first microteaching session, one participant aimed to “discuss challenges and limitations of tools used for estimating soil moisture in the landscape” and a second participant wanted to “present [the] structure of the human brain and neuropathways as well as their development.” Within this category it was interesting to note that a few participants made comments that signalled a particular approach to teaching. For example, one participant indicated a transmission approach in his desire to “pass on expertise on my topic of presentation” while another participant referenced student learning and wanted “to have students understand how to use significant figures.”

Presentation Skills. A second category of goals that emerged was a desire to improve specific presentation skills. Within this category, nearly half of the responses related to the pacing of the presentation. For example, comments included the goal “to teach at a steady pace (not talking too fast) and conclude my session on time (having covered all I wanted to teach)” and “to manage time.” Other presentation skills that participants mentioned related to clarity and organization of the presentation and the use of effective verbal and non-verbal behaviours. For example, one participant wanted to “transition between points in an organized fashion” while another wanted to “improve [their] articulation...as well as making eye contact.”

Practice and Feedback. A third type of goal related to gaining more practice and experience or receiving feedback on teaching. For example, participants wanted to “obtain experience,” and “get feedback from different perspectives.” Many of the comments in this category referenced general improvement in teaching although some participants articulated a goal of getting practice and feedback on specific elements of teaching such as “classroom presence.”

Confidence. In addition to gaining experience, many participants hoped that the microteaching experiences would help them reduce their nervousness and gain confidence in teaching. Participants spoke about the goal to “overcome” or “conquer” nervousness and to cope with stress and anxiety. For example, one participant’s goal was to “cope with my nervousness in a positive manner” and several participants mentioned wanting “improved” or “increased” confidence.

Student Engagement. The final theme that emerged from reflections on teaching goals was an intention to involve or engage students in the teaching session. For example, participants wanted to “actively involve students” and “be interactive [and] encourage active learning.” Other goals included the desire to “successfully engage students in active (hopefully thoughtful) discussion” and to incorporate “more class involvement and interaction.” The commonality among these goals was the desire to include students in the teaching session in some way.

Changes in Goals from Time 1 to Time 2. While participants showed consistency in the types of goals they mentioned from the first microteaching session to the second, there did appear to be a shift across time with respect to the frequency with which some goals were mentioned. The goals of improving presentation skills, receiving practice and

feedback, and gaining confidence appeared to be fairly stable over time. The goal of content objective seemed to decrease slightly from Time 1 to Time 2. Finally, from Time 1 to Time 2, the goal of involving or engaging students in instruction went up. In the first reflective writing sample, 6.38% of goals related to student engagement while in the second one, 23.68% of goals related to student engagement (see Figure 1).

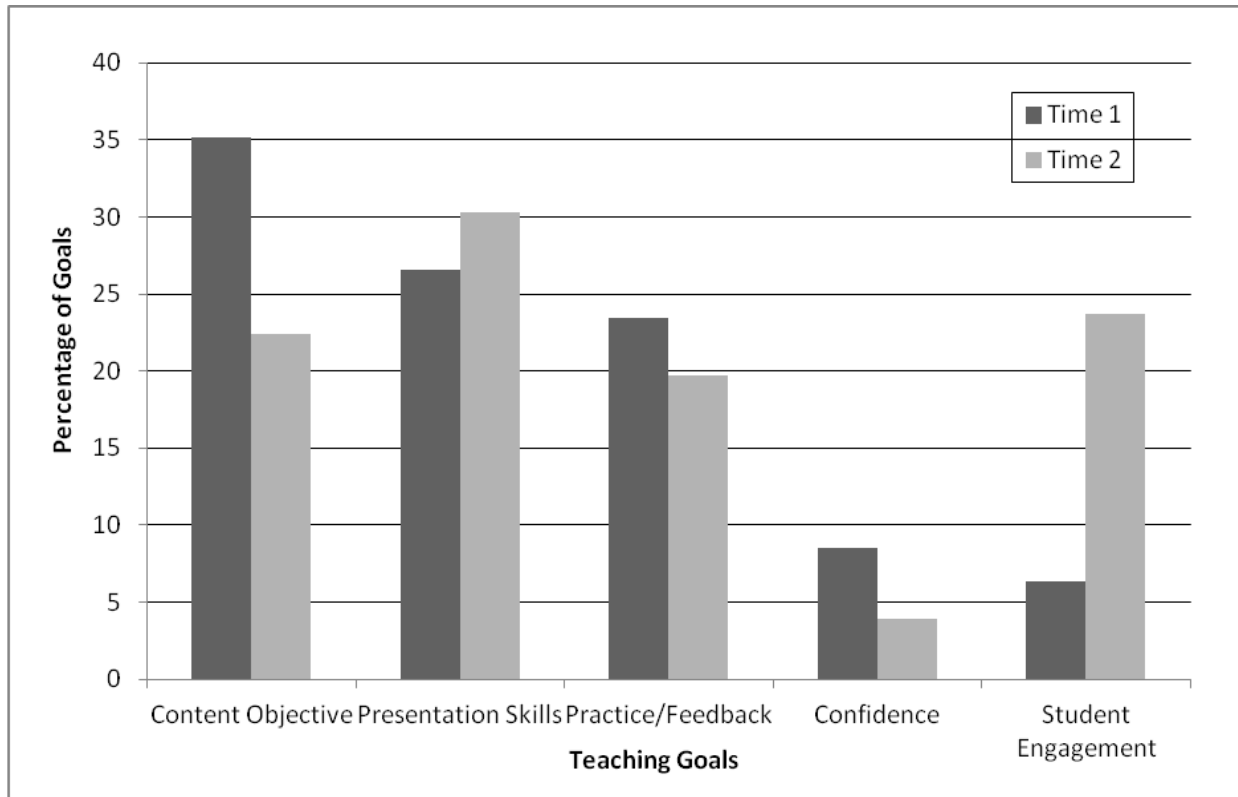


Figure 1. Percentage of TA comments across five teaching goals for Time 1 and Time 2.

Factors That Supported or Hindered Achievement of Goals

Nearly half of the participants felt that they had achieved the goal they set for themselves during the microteaching session while most other participants felt that they had partial success. Only two participants explicitly stated that they had not met their goal in either the first or second microteaching session.

Supports for Goals.

Across the first and second microteaching sessions, participants identified the following supports for achieving their goals: practice and preparation, knowledge and use of specific teaching skills, feedback and support, and confidence. Several participants commented on the importance of preparing for the teaching session and practicing in advance. As one participant noted, “my preparation and rehearsal enabled my success.” Another participant suggested she had prepared carefully for the second teaching session and “spent a lot of time preparing my transitions and carefully planning my use of the whiteboard.” Participants also mentioned relying on techniques and ideas that they had learned in the interaction information sessions or from feedback. One participant mentioned learning the strategy of “choosing a more manageable amount of

material and having several 'optional' sections that I could introduce or leave out depending on time." Participants also noted the supportive environment of the microteaching session and the opportunity to receive feedback but this form of support was emphasized to a greater degree in the second writing piece. As one participant indicated, "I had confidence my colleagues were there to support me through feedback" and another participant noted, "I totally did a good job and what helped me was the comments that I had received the other day."

Barriers to Achieving Goals.

Participants listed three common barriers to achieving their teaching goals. First, participants identified time management as a common obstacle. As one participant explained, "Towards the end I began to feel rushed (I had too much material) and my presentation suffered as a result." One participant who had time management as a goal for his second teaching session remarked that "Since I was so mindful of time, this jeopardized the clarity of my lecture somewhat (I did not take as much time to introduce concepts as I should have)." Two additional barriers that were identified by participants were nervousness and a general lack of practice and experience. For example, as one participant explained, "I felt I was distracted by being nervous." It is also worth noting that three individuals specifically mentioned that their lack of fluency with the English language was a barrier for them in their teaching sessions and was perceived to prevent them from giving clear and confident presentations.

Lessons Learned.

When participants were asked to identify the most important lesson they learned from the microteaching experience, the same five categories emerged from both the pre-test and post-test data. These themes and representative quotations are outlined in Table 2.

Table 2. Emergent Themes From Lessons Participants Learned From Microteaching.

| Theme | Representative Quotations |
|----------------------------------|---|
| Confidence and Preparation | <p><i>"Practice more. It is not as easy as it seems"</i></p> <p><i>"With practice, you'll feel more comfortable at the front of the class"</i></p> <p><i>"A careful plan—better than a script; aids in good structure and gives confidence"</i></p> <p><i>"To have more confidence and...let go of fear [in order] to be a really dynamic instructor"</i></p> |
| Pacing and Amount of Information | <p><i>"Less is more. Too much information makes it difficult for students to absorb"</i></p> <p><i>"I should underestimate the amount of material I can cover in a given period"</i></p> <p><i>"I learned to make a shorter plan for the time-frame and to use additional info as 'back-pocket' ideas in case there is more time"</i></p> |

| Theme | Representative Quotations |
|-------------------------------------|--|
| Clarity and Organization of Content | <p><i>"How to structure a tutorial...and transition to different concepts"</i></p> <p><i>"That organizing meticulously the content is a necessary first step to be an effective teacher"</i></p> <p><i>"Use simple examples when you can—avoid unnecessary complication"</i></p> <p><i>"Taking time to consider how to structure information better for students"</i></p> |
| Communication Behaviours | <p><i>"To vary my tone of voice and use these variations to draw students' attention to key pieces of information"</i></p> <p><i>"Make use of all the classroom space; don't rely on the PowerPoint and podium so much"</i></p> <p><i>"The importance of having text that accompanies your lecture visible [to students], specifically for students that may have language barriers"</i></p> <p><i>"Making eye contact and connecting with students constantly throughout the microteach is important"</i></p> |
| Student Engagement | <p><i>"How to engage students in learning activities and remaining focused on the topic"</i></p> <p><i>"The most important lesson was to involve the class more and encourage discussions"</i></p> <p><i>"People respond to interactive sessions and want to be involved, provided the presentation is informative, open, and encouraging"</i></p> |

Approaches for the Future.

When participants were asked how they could approach their teaching differently in the future, their reflections were highly related to their comments about lessons learned. In particular, participants mentioned specific changes that they would make in the future in areas such as communication behaviours, pacing, structuring information, using visual aids, student involvement, and preparation for the teaching session. For example, with respect to communication behaviours, a participant commented, "I will try to be more aware of my tone and vary it while talking. I will also try to move around the classroom more and make better use of space." For student involvement, participants mentioned strategies such as intending to "prepare questions that involve responses from most students" and encouraging "more participation through activities (i.e., mock debates, etc.)." Another participant recognized that they would approach their next teaching activity differently by "practicing several times before teaching."

While themes in the reflective writing were similar in both the pre and post samples, a more common theme after the first microteaching session was a desire to make

changes to the clarity or structure of the content (19.61% of the responses in the first sample vs. 14.29% of responses in the second sample) and a more common theme after the second microteaching session was to encourage student involvement (18.63% of responses in the first writing sample vs. 27.14% of responses in the second. Only a few participants made reference to student understanding in either the first or second writing sample.

Support Required Going Forward.

Three key themes emerged with respect to what participants felt they needed to help them reach their next teaching goals. First, participants reported needing further practice. As one participant commented, “I need more practice as well as time to prepare and rehearse my presentations. I think getting more experience would help me in becoming a better teacher.” Second, several participants wanted further resources that would help them to develop their teaching. In the case of some participants, the resources that were referred to were actual teaching materials such as “2-3 case studies for students to apply what they have learned” or “a mix of materials to engage students or all types” or “audiovisual aids.” In other cases, participants expressed a desire for further skill instruction. For example, one participant wanted “better strategies for lesson plans and time management [and] strategies for student engagement” and another participant wanted to “attend sessions on PowerPoint presentation [and] visual aids.” Lastly, with respect to the third theme, participants expressed a need for further feedback on their teaching. As one participant commented, “we can make a presentation 1000 times and keep making the same mistakes. Feedback is the most important thing to improve.”

Discussion

The first goal of the current research was to assess whether a skills-based TA training program positively impacted TAs’ teaching behaviours and professional development intentions. Both self-ratings and observer-ratings of behaviour showed an increase in the frequency and overall effectiveness of teaching behaviours from the first to the second microteaching session, indicating that the program had a positive impact on teaching behaviour. In contrast, there was no change in TAs’ intentions to engage in future professional development. The behavioural results are consistent with past research on this particular TA program (Boman, 2013) that showed significant gains in microteaching performance. These results make sense in the context of a program that focuses on specific skill instruction and practice. It was somewhat surprising that participants’ intentions toward professional development did not show an increase along with behaviour. However, upon closer examination of the data, it was apparent that professional development intentions were very high at pretest ($M=12.86$ on a 15-point scale) and participants did not have much room for growth in this area. Given the voluntary nature of the training program, it makes sense that TAs who elected to participate in the program already had positive intentions toward seeking professional development in teaching.

The second objective of the current research was to assess the impact of adding a reflective writing component to training. No significant interactions were found between time and group for any of the dependent variables, indicating that the reflective

component of training did not make an appreciable difference in teaching behaviours or professional development intentions above and beyond the regular training program. Although theories emphasize the importance of self-evaluation to self-regulated learning (Zimmerman, 1998; 2001; 2002), there are several reasons why reflective activity might not have translated to improvements in performance. First, the written reflections that participants produced were very brief in nature. Typically, participants produced one or two sentences in response to each prompt. It is unclear whether or not a stronger intervention where participants engaged in more in depth writing would have led to a different outcome. Second, it may be the case that participants were already receiving sufficient feedback and stimuli for reflection (e.g., through peers, facilitators, and digital recordings). If participants were already engaging in these processes, prompts that required explicit identification of goals and strategies may have been unnecessary. Indeed, participants were given the opportunity to debrief with their microteaching group immediately after their performance and participants may have engaged in verbal reflection in their groups.

The third objective of this research was to gain a better understanding of TAs' teaching development during the program through an analysis of their reflective writing. First, TAs identified a number of goals for their microteaching sessions including presenting specific content, using effective presentation skills, gaining experience and feedback, increasing confidence, and engaging students. The majority of goals mentioned during the first microteaching session related to content objectives and presentation skills or gaining practice and confidence. Interestingly there was a noticeable increase in the number of students who mentioned student engagement as a goal from the first to second microteaching session. Despite this recognition, there were very few participants who referenced student understanding in either the first or second teaching session.

Given that most participants were novice TAs, the goals that participants mentioned fit well with models of TA development (Nyquist & Sprague, 1998; Sprague & Nyquist, 1991). These models suggest that in early stages of development, TAs are primarily concerned with self-oriented goals and acquiring the necessary skills to help them survive early teaching experiences, while in the later stages of development TAs' focus turns to the impact of their instruction on students. Indeed, TAs' goals in this study, such as conveying content and building confidence and skills through practice, certainly seemed in line with the early stages of this model. Interestingly, the shift to a focus on the goal of student engagement in the second microteaching session showed some awareness among TAs of the role of students in instructional experiences. There could be several reasons for this shift. First, perhaps some TAs felt more confident in presenting information and could move on to focus on other aspects of instruction. Alternatively, TAs may have seen the value of student engagement in other microteaching sessions and/or received feedback about the level of student involvement in their own session and adjusted their teaching accordingly. While it is promising that TAs seemed to acknowledge the value of student interaction during teaching, it should be noted that this shift seemed to be at a surface level. In other words, while TAs wanted to involve students more in teaching sessions, their reflections did not show evidence of a deeper understanding of why it might be beneficial to engage students or

what the impact might be for the learner. Indeed, these more critical reflections and the adoption of a learner-centred perspective may require further time and experience.

Many of the TAs in this study felt that they met or partially met their goals during their microteaching session. The supports that they identified in helping them meet their goals (i.e., practice, feedback from colleagues, and knowledge of specific teaching skills) reflected the structure of the training model in that TAs completed several hours of skills instruction prior to beginning the microteaching activities. It was evident from TAs' reflections that they used several of the specific strategies that they learned from the program in their microteaching. Participants also mentioned the feedback and support they received as critical. Program facilitators intentionally devote time to community building in the program (e.g., ice breakers, sharing meals) and give instruction in how to provide constructive feedback. From participant reflections, it was evident that this element of the program was perceived as supportive and helpful. Finally, participants listed three main barriers as hindering their achievement of goals: time management, nervousness, and lack of practice. Given the large number of TAs who mentioned poor time management as a significant barrier to achieving their teaching goals, it may be useful to have further conversations around time management in the early sessions of the program and provide further specific strategies that participants can draw on for their microteaching presentations.

The key lessons that participants took away from participating in the training program were realization of the importance of teaching skills related to pacing, clarity and organization, communication behaviours, and student engagement as well as development of these skills. Participants also recognized the value of confidence and preparation for teaching. The skills identified by TAs were corroborated by the quantitative data which suggested that participants improved the frequency of effective teaching behaviours across the microteaching sessions. The outcomes identified by participants also indicated that this training program was particularly beneficial in providing TAs with concrete skills and strategies that they can incorporate into their teaching. Identification and articulation of these program outcomes is important so that TAs can make informed choices about what programs are best suited to their current needs (Dimitrov et al., 2013).

A final component of TAs' reflective writing was the identification of supports TAs needed going forward. The supports that TAs named (i.e., further practice and feedback along with teaching resources and strategies) speak to the types of professional development offerings that TAs may find most helpful at this point in their development. In particular, TAs may benefit from further opportunities to practice their teaching skills, both in small group contexts but also in classroom settings. Given TAs' desire for feedback, the availability of a mentor or observer to help debrief early teaching experiences might be particularly helpful. The need for further skill development might be met through workshops on particular teaching topics while resource development could occur in the context of TAs' departments. TAs may benefit from sharing resources with colleagues teaching in similar areas and this practice could help stimulate disciplinary conversations about teaching. TAs' identification of further supports is a reminder that TA training exists on a continuum and any one program is only one step in TAs' teaching development.

Implications

There are several implications of this research. First, with respect to TA reflections on microteaching, the written reflections were very brief. This is not necessarily surprising as many researchers have identified that while learning to reflect, students write primarily at a descriptive rather than critical level of reflection (e.g., Bain, Ballantyne, Packer, & Mills, 1999). To encourage deeper reflection with a novice group of TAs, it would be useful to provide some supports for reflection. For example, strategies to deepen the level of reflection include providing feedback or scaffolds for self-assessment (e.g., Bain, Mills, Ballantyne, & Packer, 2002; Samuels & Betts, 1997). Indeed, some researchers have suggested that a key component of self-regulated learning is that the goals set are relevant and challenging (Kreber, 2004; Zimmerman, 1986; 2000). While participants in this research received feedback on their performances, they might also benefit from receiving feedback on the relevance of the future goals and strategies identified in their reflections. Second, factors such as having practical experience to draw on as well as background knowledge of teaching including what cues to monitor and reflect on may influence teachers' ability to engage in reflection (Brookfield, 1995; McAlpine & Weston, 2000). While novice TAs have limited practical experience, a brief introduction to theories of teaching might help give them a context in which to ground their reflections. While it is unlikely that TAs can engage in the same level of critical reflection as TAs with more experience, orientation type programs do provide an opportunity to model reflection on teaching and to begin conversations that will help support TAs' reflections as they progress in their teaching development.

Another implication of the current research is the opportunity to capitalize on participants' emerging interest in and recognition of the importance of student involvement in teaching. Many participants identified student engagement as a future teaching goal or as an important lesson they learned from the microteaching experiences. Indeed, in focus groups conducted on this program, TAs indicated a shift toward more student-centered teaching approaches (Dawson et al., 2013). It would be useful to further understand how TAs conceptualize student engagement in order to build on conversations or strategies about this topic within the program or subsequent programs. Given that TA training might be participants' first introduction to teaching, considering how programs might scaffold or challenge TAs' pre-existing conceptions of teaching may be useful in helping them to further explore learner-centred approaches of instruction.

Limitations

There were several limitations to the current research. First, the study did not include a control group of participants to assess improvement of outcomes in the absence of training. A control group of TAs who did not engage in any training would help provide further evidence that changes were due to the program activities. Second, the study did not follow TAs longitudinally to see if they maintained the changes in teaching behaviours that they demonstrated across the microteaching sessions. A longitudinal study would also be useful in examining TAs' written reflections several months after the program ended as the current research only assessed TAs' immediate responses to

teaching. It is possible that further learning occurred once TAs had more time to process the experience.

Conclusion

The current research provided evidence of a skills-based TA training program in supporting the acquisition of specific teaching skills in novice TAs. Future research is needed that assesses the teaching development of TAs over time, including their conceptions of teaching and their behaviours with respect to actual classroom instruction. It would also be useful to understand more about the sequence of training activities that best promotes critical reflection and adoption of best practices in teaching and how these supports intersect with TAs' early teaching experiences. It is important that the teaching development opportunities that are offered to TAs foster a desire for continued learning about teaching and ultimately facilitate better learning for students.

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