

Training Undergraduate Teaching Assistants in a Peer Mentor Course

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Abstract:

Undergraduate teaching assistants (TAs) can play a pivotal role in university education. In many large enrolment Introductory Psychology (IntroPsych) courses, these TAs may lead small group tutorials and provide a regular point of student contact. In this important role, formal training provides guidance and support for effective teaching. To this end, we implemented a peer mentor course which introduced pedagogically based teaching principles taken concurrently with a new TA's first semester of tutoring. Teaching effectiveness and course satisfaction were measured using end-of-term evaluations from the students enrolled in the IntroPsych course. Across various measures, results indicated that TAs enrolled in the training course received higher ratings than those TAs who were not enrolled. These findings, congruous with previous studies demonstrating the effectiveness of formal training, suggest that the promotion of scholarship of teaching and learning improves the quality of small group tutorial experience for students and TAs.

Key Words:

undergraduate teaching assistants, training, student ratings.

Introduction

Instructors of large first-year courses are faced with challenges of increasing enrolment and a more diverse and variable student body. These challenges make it difficult to personalize the learning experience and to facilitate activities that promote application of concepts beyond the classroom. A solution is to implement tutorial groups lead by upper-year undergraduate students as teaching assistants (TAs) (Fingerson & Culley, 2001). Well-informed TAs remedy such issues by providing students with a small, intimate classroom setting, with direct and immediate interaction with peers (Groccia, & Miller, 1996; Smith *et al.*, 2005; Romm, Gordon-Messer, & Kosinski-Collins, 2010). While undergraduate TAs are often motivated, they may lack the expertise, teaching experience, and pedagogical knowledge to practise effective teaching (Donovan, Bransford, & Pellegrino, 1999; Sternberg & Horvath, 1995). Importantly, these factors are key to student perceptions of learning (Casem, 2006). Given these demands, it is essential to provide TAs with structured training that matches their responsibilities and clarifies their expected roles (Sutherland, 2009). To this end, we designed a peer mentor course taken by undergraduate TAs concurrently with their first semester of tutoring. The effectiveness of this training course was measured using end-of-term evaluations from students enrolled in IntroPsych.

Introductory Psychology: A Large First-Year Course

Each fall semester at this university, a diverse body of approximately 3000 undergraduate students enrol in a large Introductory Psychology (IntroPsych) course. The IntroPsych course uses a blended learning model which combines online learning resources with traditional face-to-face instruction (for a detailed overview, see Sana, Fenesi & Kim, in press). The shift from a traditional teaching paradigm to a blended learning model allows learning to be flexible and accessible for individual learning styles. In this teaching model, undergraduate TAs play a particularly important role. The components of IntroPsych Blended Learning model include: (1) online web lectures: students access primary course content through pre-recorded weekly web lectures. These modularized web lectures are highly interactive and designed based on established pedagogical principles of multimedia presentations (Mayer, 2009); (2) review classes: TAs follow a semi-structured lesson primarily used to review key concepts; and (3) tutorials: TAs lead activities and discussions providing students with an intimate and engaging atmosphere of active learning. TAs elaborate on primary course material to provide additional context and application to real-world problems (Woltering, Herrler, & Spitzer, 2009; S. Taradi, M. Taradi, Radic, & Pokrajac, 2005), and encourage students to be an active part of the learning process by generating, discussing, and solving problems in collaborative activities.

In this model, IntroPsych TAs strongly influence the student learning experience as the first point of direct student contact. As such, it is particularly important for the TA to be familiarized with their role as a facilitator to guide the effective use of course resources (Das, Mpofu, Hasan, & Stewart, 2002). The TAs also offer individual attention to students and work to foster an active learning environment through generating, discussing, and exploring multiple avenues of problem-solving in collaborative activities (Woltering *et al.*, 2009) that center on the weekly course content. This learner-centered

style, in which attendance and active participation are being graded, is designed with the intention of encouraging students to review the web lectures and course materials prior to arriving in tutorials.

Formal TA Training with a Peer Mentor Course

Although IntroPsych TAs provide an important support role for the primary course content, they may initially lack expertise, teaching experience, and pedagogical knowledge to teach effectively (Prieto and Altmaier, 1994). They may be unsure of whether their teaching matches course standards or skills of their peers (Romm *et al.*, 2010). These factors can lead to unwanted variability in the quality of the student learning experience (Woltering *et al.*, 2009) and satisfaction (Gibbs & Coffey, 2004; Jacob & Lefgren, 2004). Ideally, TAs benefit from a structured and cooperative environment where they are adequately prepared for the challenging role of teaching, meet with the instructor and peer TAs to gain practical application of pedagogical theories, evaluate self and peers in a collaborative learning space, and explore experiential teaching activities (Meyers & Prieto, 2000; Park, 2004). With these goals in mind, we designed a training course that introduced the scholarship of teaching and learning. Importantly, the peer mentor course was modeled to include components similar to that of the target IntroPsych tutorials. This allowed the instructor to model active learning by promoting scholarly teaching practice and provided TAs with practical experience.

Course Structure. The peer mentor course was offered for credit exclusively to new undergraduate IntroPsych TAs to take concurrently in their first semester of teaching. This allowed the instructor to tailor the course content and skill development to this select group. In its first year of implementation (fall of 2008), the course was made optional for new IntroPsych TAs. This offered a unique opportunity to compare two populations of TAs—those who enrolled in the training course and those who did not. Beginning in the fall of 2010, the peer mentor course is now required for all new TAs. Each week, TAs gathered for a three-hour session with the instructor to introduce the scholarship of teaching and learning. Course topics included instructional design, discussion methods, knowledge structure in pedagogical literature, and teacher-centered and student-centered instructional methods. The theoretical elements of the course were based on readings on the scholarship of teaching and learning, pedagogy research, and cognitive models of learning. The course structure was much like that of the IntroPsych course and used a blended approach to promote a collaborative, inquiry-based process in which TAs explored, discussed, and evaluated the theories related to teaching practice. The practical elements were further supplemented by workshops led by experts in the teaching of Psychology. Reflection on teaching was formalized through a weekly journal entry to track progress and receive constructive feedback from the instructor. TAs also observed and received feedback on teaching and learning from their students and peers on a regular basis.

The tutorial component of the peer mentor course allowed TAs to discuss scholarly articles, find solutions to real class problems, and model the guided interaction in which TAs would engage their own students in IntroPsych tutorials. For example, the same marking rubric for active participation used to evaluate IntroPsych students was also

used to evaluate TAs in the peer mentor course. During every session, a group of TAs would lead a mock tutorial of the upcoming scheduled IntroPsych tutorial incorporating principles from the scholarship of teaching and learning principles discussed to date. The mock tutorial performance was critiqued by peers and the course instructor with respect to engagement, facilitation, and promotion of discussions and activities. The following week, the presenting group submitted a summary reflection on their presentation based on feedback from self, peers, and students. Another component of the course consisted of each TA being evaluated on his/her teaching skills, during a structured classroom observation, by peer TAs. Finally, all TAs were required to write a research proposal; the goal of this project was to give them practice with evaluating theory and practice in the research of the scholarship of teaching and learning.

Method

Participants. In 2008 fall semester, there were a total of 56 undergraduate IntroPsych TAs, 27 of which were enrolled in the training course. All participants were either in their third or fourth year of study and had a similar psychology background. Each had the option of enrolling in the training course, concurrent with the start of their teaching term.

Materials. Students enrolled in Introductory Psychology completed an end of term course evaluation which included course ratings. Each question was evaluated using a five point Likert scale where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Course ratings section consisted of seven questions, with each aiming to measure a separate aspect of the course. We will focus on the four questions pertaining to this study (see Table 1). Teaching assistant ratings consisted of five questions of interest, each focused on a separate aspect of TA abilities (see Table 2).

Table 1: Measures in Course Ratings Section

<i>Review enjoyment</i>	I found the review class to be an enjoyable part of the course.
<i>Review value</i>	I found the review class to be a valuable learning experience.
<i>Tutorial enjoyment</i>	I found the tutorials to be an enjoyable part of the course.
<i>Tutorial value</i>	I found the tutorials to be a valuable learning experience.

Note. These four statements are taken from the course evaluation measuring different aspects of classroom. Students responded to each statement using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Table 2: Measures in Teaching Assistant Ratings Section

<i>Knowledge</i>	My teaching assistant had a very strong knowledge of the course content.
<i>Rapport</i>	My teaching assistant had an excellent rapport with students.
<i>Clarity</i>	My teaching assistant explained the material very clearly.

<i>Discussions</i>	My teaching assistant was able to lead effective discussions.
<i>Overall</i>	Overall, my teaching assistant was an excellent instructor and learning resource.

Note. These five statements are taken from the course evaluation measuring different abilities of the TA. Students responded to each statement using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree)

Predictions. We hypothesized that TAs enrolled in training course would score higher on measures of tutorial/review enjoyment, discussion facilitation, and overall effectiveness compared to TAs who were not enrolled in the training course.

Procedure. Data collection was conducted in McMaster University classrooms during December 2008. Other than class section and TA name, students' responses remained anonymous, in order to minimize response bias. To prevent students' answers from being influenced by the presence of their TA, all TAs were asked to leave the room during evaluations. Responses were collected, recorded, and transcribed by the instructional assistant for the course.

Results

Nonparametric statistical methods were used for analyses because there was no *a priori* basis to assume a normal distribution of the data. A Mann-Whitney *U* test was conducted to evaluate the hypothesis that the trained TAs differ from the untrained TAs on various measures. The effect size (*r*) relevant for non-parametric tests was measured using the methodology provided by Clark-Carter (1997).

Course ratings. Table 3 shows a summary of results for course ratings. There is a significant difference between the trained and untrained group on measures of enjoyment for review classes (Mann-Whitney $U = 242.500$, $n_1 = 27$, $n_2 = 29$, $p < 0.05$, $r = 0.33$) and for tutorials (Mann-Whitney $U = 214.500$, $n_1 = 27$, $n_2 = 29$, $p < 0.05$, $r = 0.4$). There was a marginal difference between the two groups for value placed on tutorials (Mann-Whitney $U = 288.500$, $n_1 = 27$, $n_2 = 29$, $p < 0.1$, $r = 0.23$).

Table 3. Course Ratings

Question	Group	Mean Rank	Z score	U	P value
Review Enjoyment	Trained	34.02	-2.444	242.500	.015**
	Untrained	23.36			
Review Value	Trained	31.33	-1.255	315.000	.209
	Untrained	25.86			
Tutorial Enjoyment	Trained	35.06	-2.904	214.500	.004**
	Untrained	22.40			
Tutorial Value	Trained	32.31	-1.689	288.500	.091*
	Untrained	24.95			

Note. Mann-Whitney U tests comparing TAs enrolled and not enrolled in the training course on classroom measures.

** $p < 0.05$

* $p < 0.1$

TA ratings. Results for the five questions are shown in Table 4. There is a marginal difference between the trained and untrained groups in their ability to effectively lead discussions (Mann-Whitney $U = 287.000$, $n_1 = 27$, $n_2 = 29$, $p < 0.1$, $r = 0.23$). There was no difference between the two groups on other measures of TA ratings.

Table 4. Teaching Assistant Ratings

Question	Group	Mean Rank	Z score	U	P value
Knowledge	Trained	27.61	-.394	367.500	.694
	Untrained	29.33			
Rapport	Trained	31.72	-1.427	304.500	.154
	Untrained	25.50			
Clarity	Trained	28.98	-.213	378.500	.831
	Untrained	28.05			
Discussions	Trained	32.37	-1.714	287.000	.084*
	Untrained	24.90			
Overall	Trained	29.89	-.615	354.000	.539
	Untrained	27.21			

Note. Mann-Whitney U tests comparing TAs enrolled and not enrolled in the training course on TA abilities.

* $p < 0.1$

Discussion and Conclusion

Course ratings. TAs in the training course had the benefit of theory and practice in the scholarship of teaching and learning to improve student engagement. TAs also received regular feedback on their teaching practice through weekly written reports, reflecting on positive and negative teaching experiences. The results were somewhat consistent with our prediction for an observed significant difference between the student ratings for trained and untrained TAs in enjoyment of review classes and tutorials (see Table 1).

Although there was no significant difference observed for student ratings for value attributed to review classes, there was a trend towards higher ratings for review classes delivered by trained vs. untrained TAs. These classes were not mandatory for IntroPsych students and the material covered during these sessions was a general overview of the week's lecture materials. Given the review nature of the content, these classes may have higher variability in relevance to student needs. Notably, TAs did not

receive specific training on the course material content to be presented in the review classes, and both trained and untrained TAs were instructed to follow the prepared materials strictly.

However, for the measure of tutorial value, results demonstrated a marginal statistical difference between the two groups. Unlike review classes, TAs received specific training and guidance for each tutorial. Each week during the training course, a small group of TAs presented discussions, activities, and application of principles and theories pertaining to the upcoming week's tutorials. These ideas could be incorporated into their own tutorials, and presenters were provided with feedback on their pedagogical approach, content delivery, and discussion facilitation skills. A discussion board assigned for the training course allowed an extension of discussion beyond the classroom experience to include improvements and useful suggestions for others to incorporate. Thus, several factors likely influenced higher student ratings for value attributed to tutorials: constructive peer feedback, integration of creative teaching methods into activities, and training to lead discussions based on student needs.

TA ratings. We made no predictions regarding the measures of knowledge, rapport, and clarity. In fact, high performances on these three factors were pre-requisites for IntroPsych TA eligibility. For both groups, all candidates had completed similar courses relevant to psychology and shared comparable knowledge for the course content of IntroPsych. Through a rigorous selection process (approximately 250 applicants, with 100 selected for interviews, and 40 hired), candidates were scored on interpersonal skills and ability to clearly present information in a structured interview prior to hiring.

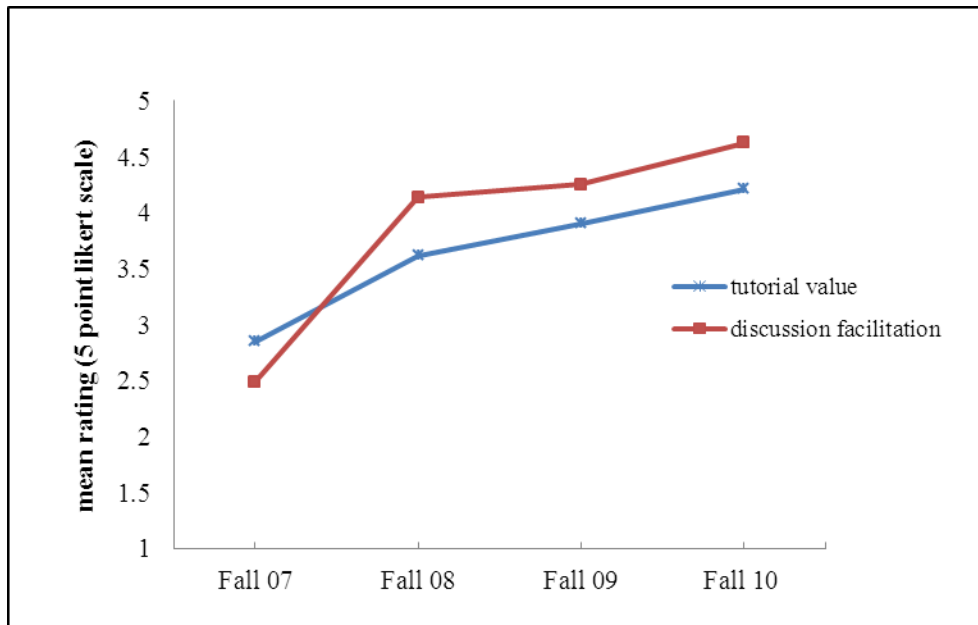
Surprisingly, the difference between groups on the measure of ability to facilitate discussions was only marginally significant ($p = 0.086$). Although the mean ranks for trained and untrained TAs on this measure were 32.37 and 24.90 respectively, the weak statistical significance may be due to high baseline levels on TA qualities and a small sample size. Since one of the goals for the training course was to hone skills on effectively leading discussions, we expect to see a significant difference between the two groups on this measure if a larger study were conducted.

The overall effectiveness of the tutor as an instructor and learning resource did not differ significantly between trained and untrained TAs. We believe this question is double-barrelled, as students may have responded this way if one or both qualities (excellent instructor or learning resource) were present in their TA. Therefore, the final answer may not have reflected the effectiveness of the tutor as an instructor and learning resource as separate qualities. Future end-of-term evaluations will separate the two qualities into different questions. Furthermore, we are in the process of developing a separate tool which will directly measure principles and models of good classroom instruction, as taught in the peer mentor course. The items will reflect the criteria of effective teaching and those within the range of judgment in IntroPsych classrooms.

In each year since its implementation, the peer mentor course has been refined with the help of TA feedback. To get a sense of how the quality of the tutorial experience has changed across the years, we tracked IntroPsych student responses on the same questions used annually to compare perceptions on two measures: (a) value placed on tutorials and (b) TA's ability to effectively facilitate discussions. The data presented

Figure 1 show the student mean ratings for these measures across years and has limitations as an experimental tool as noted. Nevertheless, since implementing the peer mentor course in Fall 08, student ratings for measures showed a dramatic improvement from the previous year (Fall 07) and an increasing trend in the years following course implementation.

Figure 1. Pattern of increase in student ratings on two measures.



Note. Student ratings on discussion and tutorial value across years.

The ratings were measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Data reported are from Fall 07 (n=1817) – year prior to the introduction of the training course; Fall 08 (n=1208) – year the training course was implemented; Fall 09 (n=2447); second year of training course (note that IntroPsych course enrolment cap was increased), and Fall 10 (n= 420), third year of training course (note that evaluations moved to online).

A remaining limitation for the study deals with the generalizability of these findings. Since TAs self-selected to enrol in the training course, there may be a bias for these TAs to have a greater interest in the scholarship of teaching and learning. However, during the interview process, all TAs were tested on their ability to teach and present on a psychology-related topic to an interview panel and participate in a semi-structured interview. Thus, all TAs were presumed to have similar goals and interests in teaching. Another potential issue was that veteran TAs were exempt from taking the course due to their experience teaching the course, familiarity with the course structure, and prior informal guidance and mentorship. This resulted in greater number of new TAs (26 TAs) enrolling in the course, and 11 of 12 returning TAs choosing to opt out of this course. However, other studies where TAs were randomly assigned to training and control groups demonstrated similar results; the trained group received higher student ratings than the control group on different aspects of TA performance and course effectiveness ($p < 0.1$) (Carroll, 1977; Gibbs & Coffey, 2004).

Formal TA training can have a critical role in the success of student's overall course perception, learning, and achievement (Gibbs & Coffey, 2004). It allows a focus to be on a learner-centered approach to promote greater content comprehension (McCombs & Miller, 2007; Henson, 2003). Training provides TAs with an understanding and appreciation of teaching to acquire and apply effective skills in the classroom. It also provides guidance to adequately fulfill expectations and provide quality instruction to their students. This study is one of many to offer preliminary support for the importance of training undergraduate TAs (Hogan, Norcross, Cannon, & Karpiak, 2007; Jacob & Lefgren, 2004; Carroll, 1980). Specifically, the results demonstrate positive effects of a dedicated training course, though additional research is needed to assess students' cognitive and affective learning as a result of TA training. Nonetheless, significant ratings of trained TAs on measures of review and tutorial enjoyment, tutorial value, and discussion facilitation provide support for the training course as an effective tool to improve teacher and student experience in the classroom.

A successful peer mentor course must constantly be revised according to student needs. Ongoing formal and informal feedback from TAs, students, and research in progress continues to shape the development of this TA training course. The present study joins a growing body of research demonstrating the importance of a TA peer mentor course. The shift in focus for this literature should now be on the nature of the training which results in effective teaching and student achievement.

Acknowledgements

We gratefully acknowledge the contributions of IntroPsych teaching assistants for their thoughtful discussions and feedback in refining the training course.

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