An Initial Exploration:

Perspectives from Graduate Teaching Assistants

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Abstract

Graduate Teaching Assistants (GTAs) play a critical role in many undergraduate STEM courses. They serve in supporting capacities, but they are also often used as instructors of record. It is essential that GTAs are trained on the technical content needed for these positions; however, it is also crucial that they are well versed in pedagogy so that they can effectively teach their students the technical content. Through this Work in Progress paper, we will briefly describe a course that serves as the inspiration of this work and provide initial results from a survey designed to measure GTAs' self-regulation, self-efficacy, and cultural sensitivity. The information we have collected will allow us to improve opportunities for GTA development.

Keywords

Graduate Teaching Assistants, Self-Efficacy, Self-Regulation, Cultural Sensitivity

Background

Graduate Teaching Assistants (GTAs) play a critical role in many undergraduate courses.[1] In engineering, they serve in supporting capacities as assistants or sometimes graders[2], but they are also often used as instructors of record for labs and recitations. It is vital that GTAs are trained on the technical content needed for these positions so they are knowledgeable about their subject area. Typically in engineering, there are programs that provide adequate training in technical content.[3-6] However, it is also crucial that they are well versed in pedagogy and effective reaching practices so that they can effectively educate their students the technical content.[7] Teaching and learning centers typically provide some training related to teaching practice, but it is often once during a GTA's career[8] and is usually not STEM or engineering specific. GTAs are often future faculty, so proper education and professional develop has the potential to create sustained educational innovations and best practices in the future.

Methods

A course was developed at a large Midwestern university (U1) to better prepare GTAs in first-year engineering programs. The course was offered in the fall semesters of 2015 and 2016 where both offerings were completed by approximately 20 GTAs each year. Both offerings were well received by GTAs, faculty, and students based on course evaluations. The course covered a variety of topics including, but not limited to, setting expectations, managing undergraduate teaching assistants, classroom assessment techniques, active learning, and evaluations. The format for the class is module in nature where each class is a stand along topic. The modules are also very practice oriented where each class begins with a discussion on the past week, includes

a brief overview of theory and literature related to the topic, and incorporates at least one hands on element that GTAs can implement in their own classrooms.

Now that the course has been successfully piloted for GTAs teaching in different first-year engineering courses at one institutions, we are interested in expanding the objectives and impact of this course to other settings including new institutions and programs. Specifically, our research question is: ***How do GTAs develop their pedagogical epistemologies?*** To begin to answer our research question, we have collected pilot data from a survey. The survey aims to capture GTAs' self-regulation, self-efficacy, and cultural sensitivity and is comprised of questions from previously created instruments.[9-11] For each of these instruments, we decided to employ a 6-point scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree). We purposely chose a 6-point scale since the original instruments has differing scales and this scale fell in the middle. We also included a set of demographic questions to begin to compare trends across groups. The survey has allowed us to establish a baseline at each institution before we begin our exploration into expanding the course.

To date, we have administered this survey as a pre-test to GTAs at three different institutions. At the end of this academic term, we hope to administer a post-test version of the instrument to measure change over one semester. The survey was given to 54 GTAs (21 U1, 10 U2, and 23 U3) for the pre-test which yielded a response rate of 33% (18 participants). We only included participant responses if they answered at least one of the closed ended items. Some items were not answered by all participants.

Initial Results

We began our analysis by reverse coding questions that were intentionally inverted in scale. We then assigned a -3 through 3 to the responses where -3 corresponded to strongly disagree and 3 corresponded to strongly agree. Examining the data, we noted that for each construct the participants agreed or somewhat agreed (self-regulation = 1.6, self-efficacy = 1.8, cultural sensitivity = 1.8) indicating general positive belief towards these teaching related ideas.

Below are select findings from the pre-test survey. In order to appropriately scope these results for the Work in Progress format, we have chosen to provide average results compared to one demographic item for each construct using a Box and Whisker plot. In the future, we plan to explore the various items in each construct more deeply to identify additional trends. We also plan to include a qualitative portion to this work to better understand the findings.

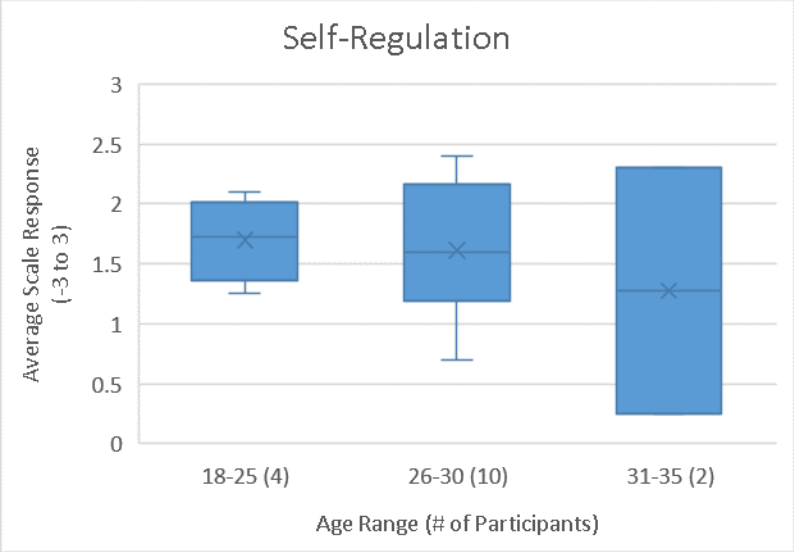

Figure 1: Participants' Self-Regulation Related to Age

We compared self-regulation to age (Figure 1). We noted that the spread of responses increased with age in this limited sample. In further phases on this work, we would like to explore this trend over a large age span.

We compared self-efficacy to semester of teaching experience (Figure 2). Due to our limited sample, we did not observe any trends but did note that the average self-efficacy score remained consistent among the categories. We hypothesis that self-efficacy will increase with additional semesters of teaching experience.

We compared cultural sensitivity to international status (Figure 3). We noted that the spread of responses was greater for international students and that the mean was slightly higher. In further phases on this work, we would like to explore this trend through additional constructs such as first language.

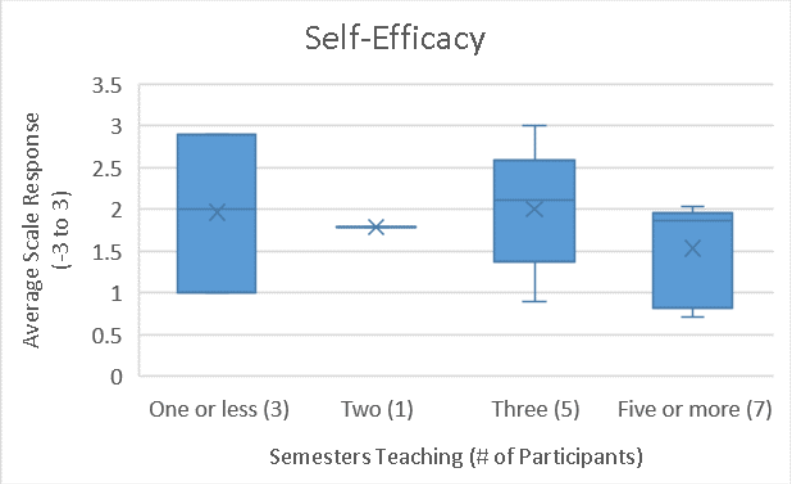

Figure 2: Participants' Self-Efficacy Related to Teaching Experience

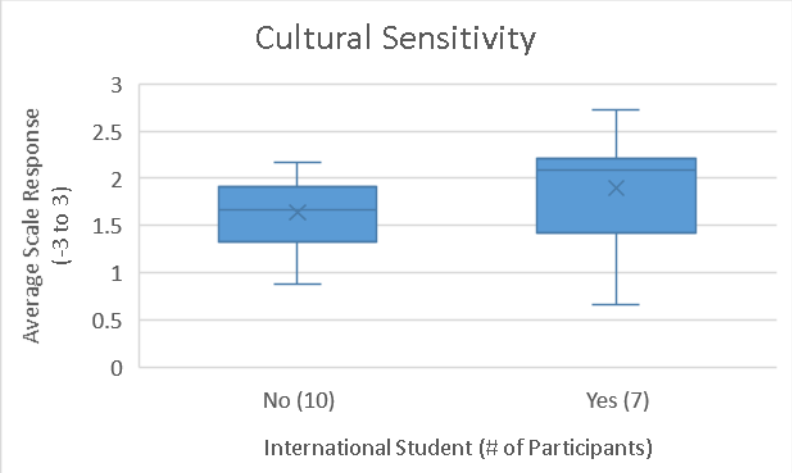

Figure 3: Participants' Cultural Sensitivity Related to Intnat. Status

Conclusions and Future Work

The information we have collected will allow us to improve opportunities for GTA development. As this work progresses, we plan to develop resources that can be used by a variety of institutions to better support GTAs in their pedagogical development based on our exploration of self-regulation, self-efficacy, and cultural sensitivity. While the implementation of this training will cater to engineering specifically, we believe the results will encourage its integration into existing resources to complement the range of resources currently provided by teaching and learning centers and departments.

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