Assessment of Understanding and Anxiety Before & After Assistant Facilitation

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Abstract

Common challenges among college students include overcoming anxiety and understanding of course material. In this study, we aimed to improve STEM students' understanding of course material and decrease their anxiety through assistant peer-facilitation. Each PAL class met twice a week. On the first day of class, we announced who will be Assistant Facilitators for the week and the material they will be covering. The following class involved facilitating for the last 25 minutes of class and the completion of a short survey to reflect upon their experience. Assistant facilitators asked scaffolding questions, guided their peers, and avoided providing direct answers. *On average, students' understanding of material increased by 20.2%, while anxiety dropped by 21.8%.* We concluded that students' understanding of course material increases, and anxiety decreases, when they practice the material through assistant facilitation.
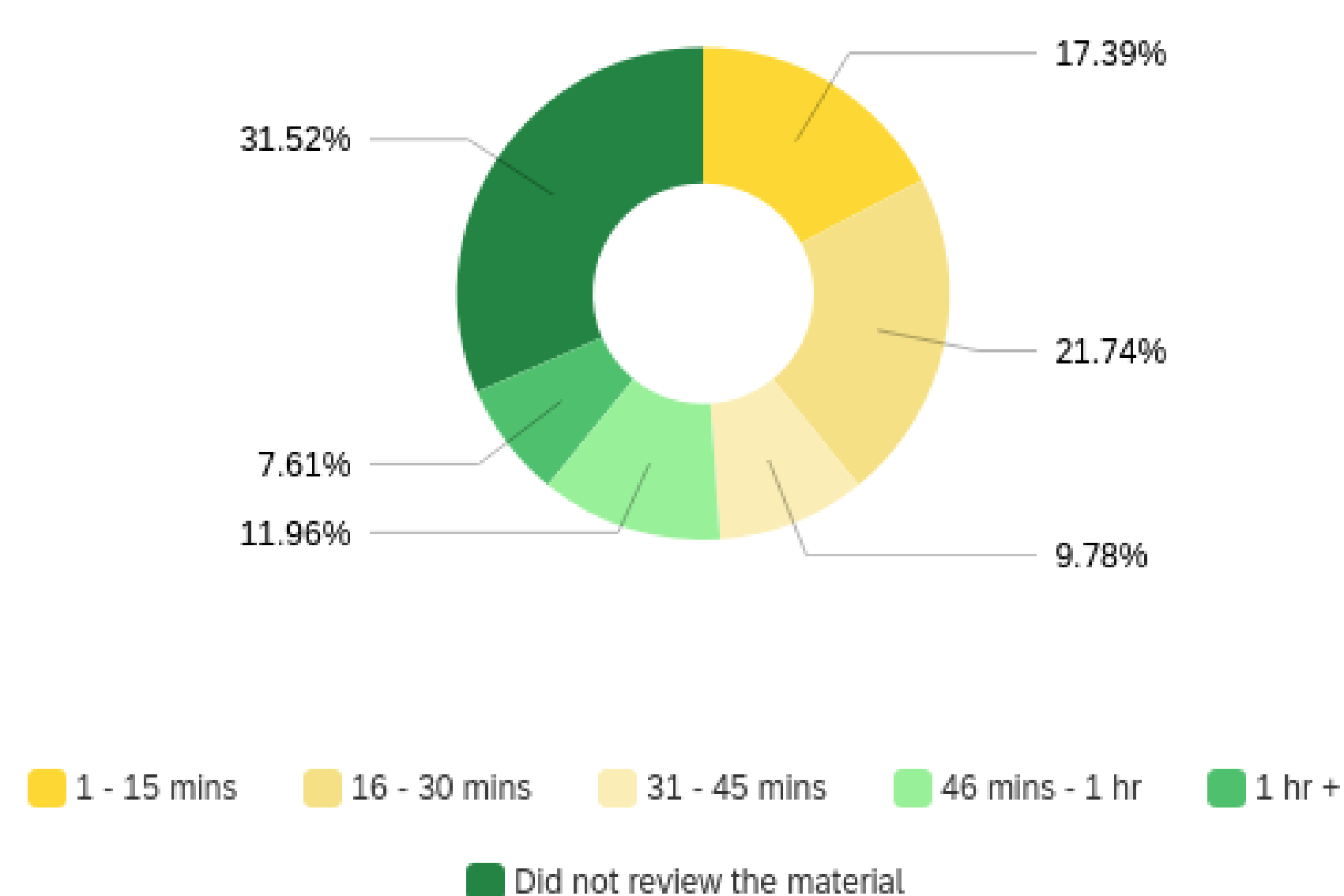
Background

This study aims to improve students' understanding of course material through assistant peer-facilitation and mentorship. Assistant peer-facilitation provides students with the opportunity to self-reflect on their understanding of difficult concepts and encourages students to spend more time engaging with course content. In alignment with the aim of our research, one study found that "peer teaching" significantly increases comprehension and overall academic performance compared to "direct teaching" (Rusli et al., 2020). Furthermore, a study published by the *Journal of Leadership Education* emphasizes the link between peer teaching and an increase in confidence and leadership self-efficacy. A study conducted at a research university in the Mid-Atlantic U.S., undergraduate peer teachers reported significantly increased levels of confidence and leadership self-efficacy in an end-of-the-semester survey (Bryne et al., 2022). Researchers have found that a series of fears and worries contribute to "teaching-associated anxiety," including lack of experience, fear of making mistakes, and the inability to build positive relationships with students. Recognizing and developing strategies to cope with anxiety have proven to be valuable in academic settings (Han & Tulgar, 2019). That said, not all anxiety is harmful; research suggests that students with average levels of anxiety perform better academically, and experience increased levels of motivation (Majali, 2020).
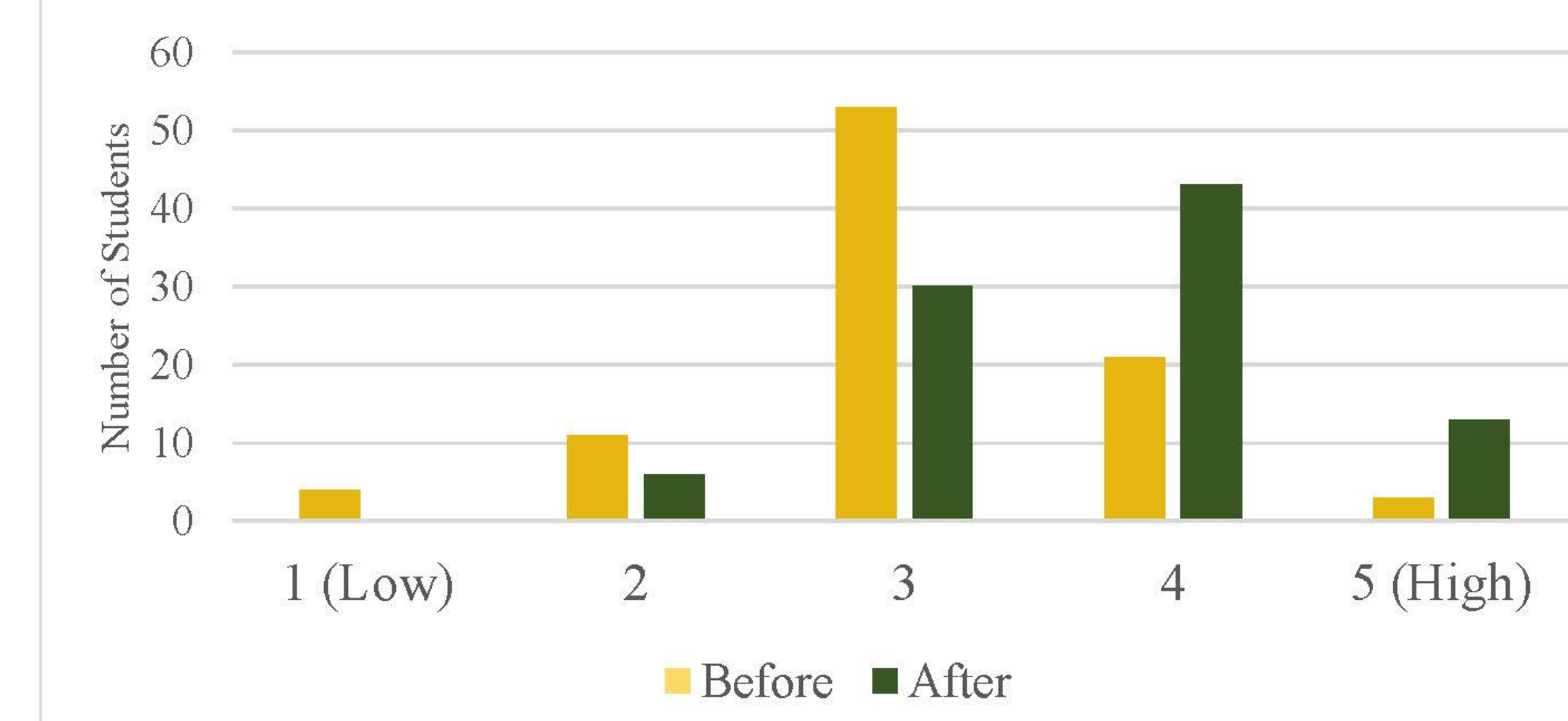
Methods

To evaluate the anxiety-inducing effects and comprehension of course material associated with being appointed Assistant Facilitator, our team administered in-class surveys during weeks 5-13. The survey, comprised of seven qualitative and quantitative questions, assessed student preparation, anxiety, and understanding of course material prior-to and after serving as Assistant Facilitator. The experiment was conducted on students enrolled in a PAL course for general chemistry, organic chemistry, and calculus II. Within each PAL section, PAL Facilitators nominated one student (per each group of 3-5) to serve as Assistant Facilitator during the second half of the 50-minute class period. Students were notified that they were going to function as Assistant Facilitator one class period in advance, in addition to the concepts they would be expected to facilitate. While facilitating their peers, Assistant Facilitators followed the same guidelines and methods that the PAL model set a precedent. The roles and responsibilities of Assistant Facilitator included: using scaffolding techniques to guide peers in the right direction, avoiding the confirmation and/or denial of answers, and ensuring equal distribution of input and participation from members of their group. To corroborate order and productivity, PAL Facilitators were available to assist Assistant Facilitators when needed. Functioning as an Assistant Facilitator allowed students to gauge anxiety levels and self-assess their understanding of course material.

Data & Results

Time Spent Reviewing Material

- 17.39%
- 21.74%
- 9.78%
- 11.96%
- 7.61%
- 31.52%

Legend: 1 - 15 mins | 16 - 30 mins | 31 - 45 mins | 46 mins - 1 hr | 1 hr + | Did not review the material

Understanding of Course Material (Number of Students vs. 1 (Low) to 5 (High)) — Before, After

Level of Anxiety (Number of Students vs. 1 (Low) to 5 (High)) — Before, After

Results

The mean value for the student's understanding before being a facilitator was 3.07, while the mean value after being a facilitator was 3.68. For our paired t-test of student's understanding before and after, we acquired a p-value of 4.9×10^{-11}.

The mean value for the student's anxiety before being a facilitator was 2.29, while the mean value after being a facilitator was 1.79. For our paired t-test of student's anxiety before and after, we acquired a p-value of 6.0×10^{-7}.

Our students' qualitative responses varied from helpful, to potentially detrimental. Many students included key words associated with a positive experience, such as "good", "confident", "great", and "relaxed". The responses that indicated a potentially negative experience included keywords such as "stressful", "counterproductive", and "awkward". One of the common situations that was found in all types of responses was the problem of not being able to answer students directly with the answer. Because of the PAL model, which involves scaffolding, many facilitators had to find alternative ways to get their fellow classmates on the right track to solving a problem.
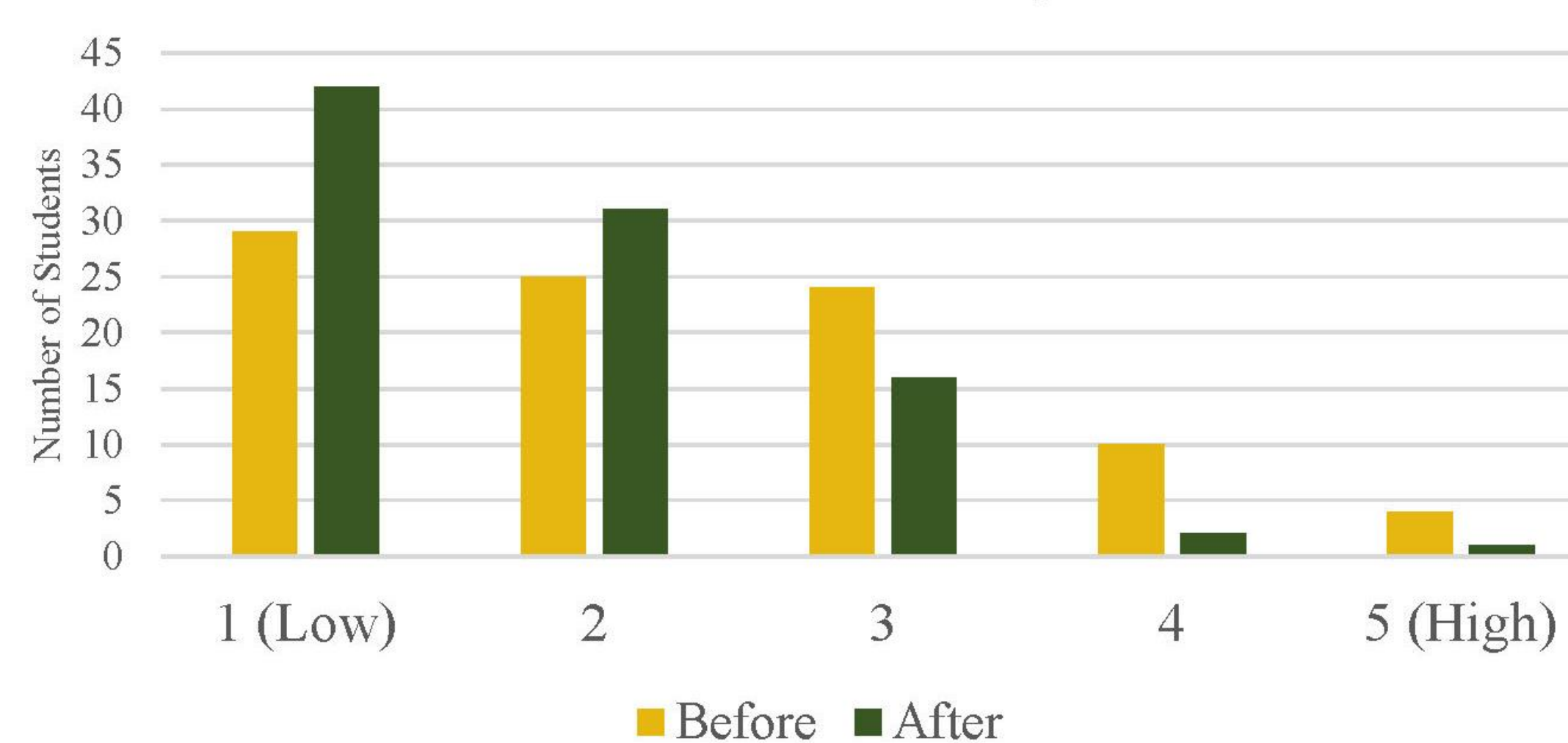
Discussion

The hypotheses that implementing Assistant Facilitators in PAL classes will increase understanding and reduce anxiety with the material was supported. The students' mean understanding level increased and mean anxiety level decreased after becoming Assistant Facilitator. The difference between the average understanding level before and after being the Assistant Facilitator was greater than that of anxiety level. The p-values suggested that our results were statistically significant, and there was a significant difference between the understanding and anxiety levels before and after being Assistant Facilitator. We reasoned that being an Assistant Facilitator would boost students' confidence with and comprehension of the material. Possible errors could result from dishonesty in the surveys by students anticipating the desired results of the survey. Future studies could examine the benefits of having one Facilitator for the entire class and could quiz students on their understanding of the material before and after becoming Assistant Facilitator.

Acknowledgements

References

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