

# Fostering Student Confidence Through Knowledge Reinforcement

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## ABSTRACT

STEM students struggle to maintain confidence going into exams. For this study, facilitators administered to their students an exam review worksheet consisting of previously completed Peer Assisted Learning (PAL) worksheet questions. Statistical analyses of student confidence and perceived exam grade for the students' first and second exams were conducted through t-tests. We found that administering a review worksheet crafted from previously completed worksheets significantly increased student confidence and anticipated exam grades.

## BACKGROUND

- PAL has been extremely beneficial for students, yielding, on average, a 23% increase in course GPA compared to their non-PAL peers (Shanbrom et al., 2023). However, this does not reflect students' confidence going into an exam.
- A study found that knowledge and confidence improved when students were provided with extra practice that reinforced material they were currently learning (Lucero & Chen, 2020).
- We strive to boost student confidence and exam performance by providing the students with a perspective showing how their knowledge has grown throughout the semester.

## ACKNOWLEDGEMENTS

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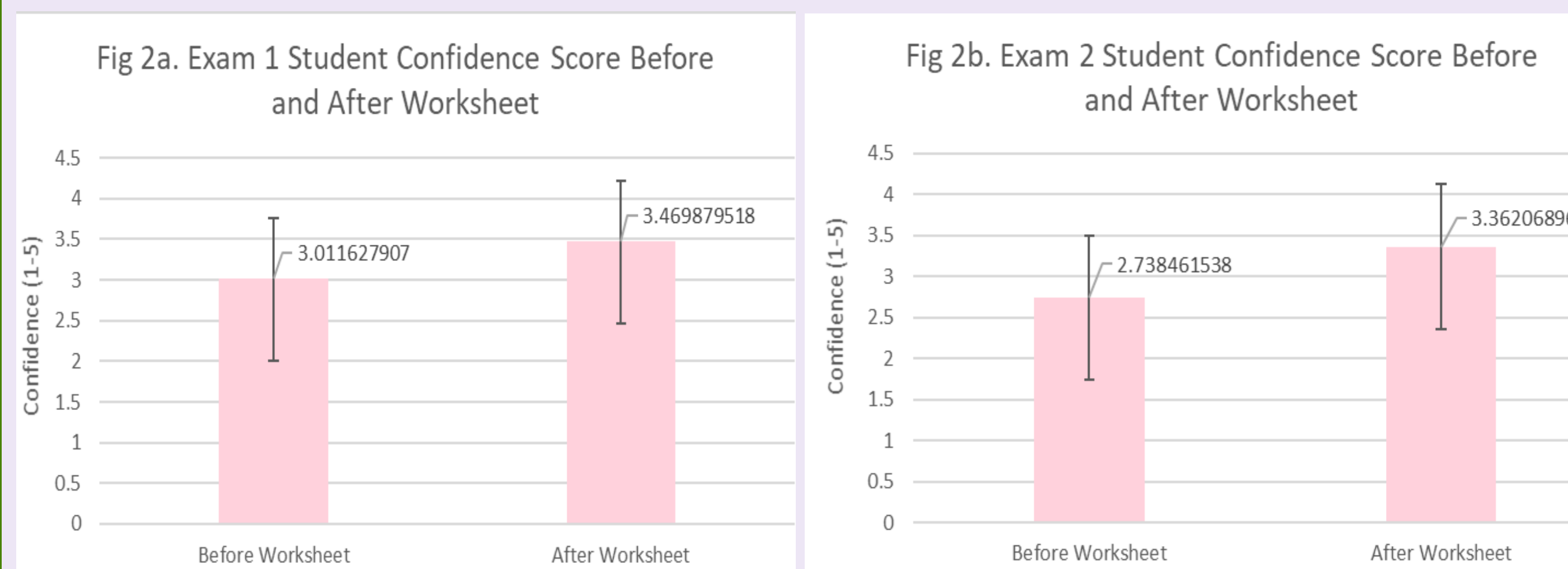
## RESULTS



**Figure 1:** Percentage of students who predicted they would receive a B or above before and after completing the review worksheet for Exam 1 (28.9% increase), and Exam 2 (32.8% increase).

**Exam 1:**  $n(\text{before}) = 87$ ,  $n(\text{after}) = 82$ ,  $p = 0.251$

**Exam 2:**  $n(\text{before}) = 63$ ,  $n(\text{after}) = 58$ ,  $p = 0.0960$



**Figure 2:** Average confidence levels of students before and after completing the review worksheet for Exam 1 (15.2% increase), and Exam 2 (22.8% increase). Note: 1 = not at all confident, 2 = barely confident, 3 = somewhat confident, 4 = confident, 5 = very confident.

**Exam 1:**  $n(\text{before}) = 87$ ,  $n(\text{after}) = 82$ ,  $p = 1.42e-4$

**Exam 2:**  $n(\text{before}) = 63$ ,  $n(\text{after}) = 58$ ,  $p = 5.23e-5$

## METHODS

We created review worksheets for our PAL classes (Bio131, Bio 26, Chem 1B, Math 30, Phys 5A). These review worksheets were worked on by students during the PAL class preceding the students' exams and they consisted of questions derived from PAL worksheets previously completed by the students. To gauge the progression of student confidence prior to and following review worksheet administration, anonymous surveys were provided. For each exam, a pre-review worksheet survey and a post-review worksheet survey were administered during the same PAL class.

## DISCUSSION

Data analysis suggests that completion of the review worksheet didn't significantly affect students' exam grade predictions meaning there is unlikely to be a correlation between those two factors. In contrast, data analysis of student confidence shows a significant difference between before and after completion of the worksheet for Exam 1 and 2. This suggests the intervention improved student confidence going into exams. Given how vital student confidence is towards student success, future studies could build on our research by extracting students' exam grade data to further examine potential correlations.

## REFERENCES

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