

# DO STUDENT ATTITUDES TOWARD ACTIVE LEARNING AFFECT THEIR MIDTERM SCORES?

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## DESCRIPTION

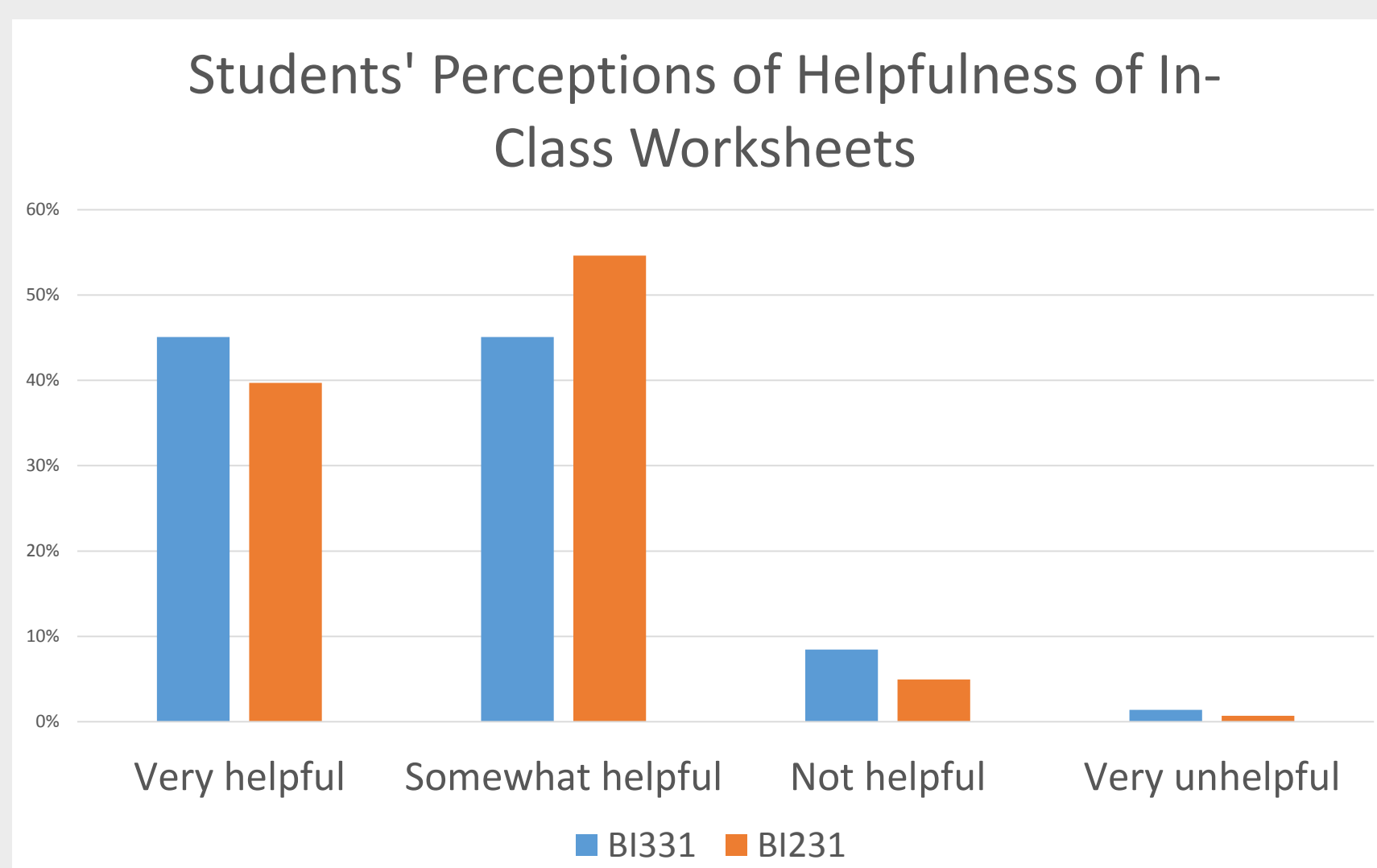
This study investigates how student attitudes toward active learning impact their midterm scores in BI231 and BI331. To do this, the students were surveyed regarding the perceived helpfulness of in-class worksheets. Survey results were correlated with midterm scores to determine whether perceived helpfulness of worksheets was associated with success on the midterms. The results were analyzed for correlations between positive attitudes and higher midterm scores.

## RATIONALE

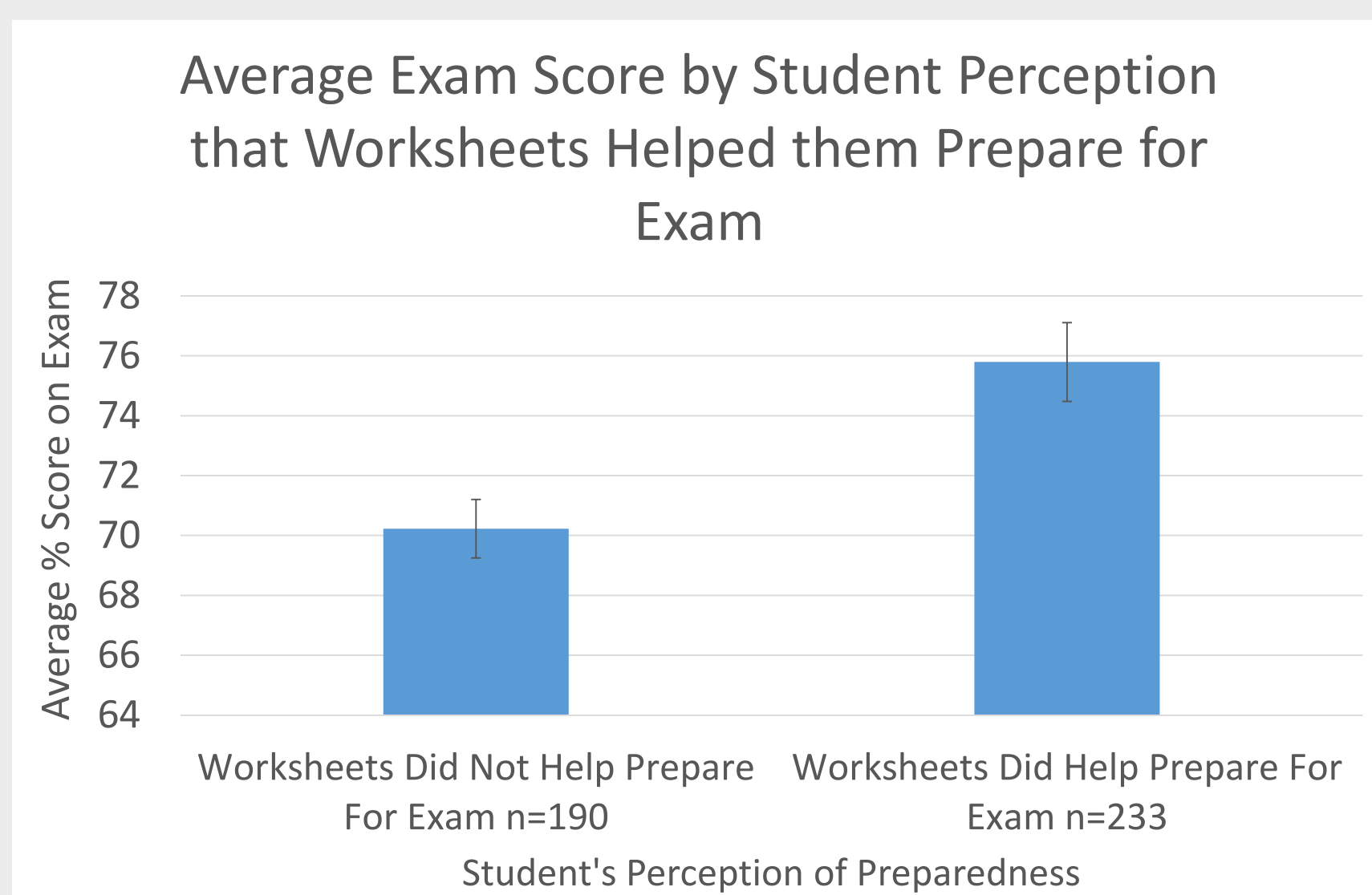
With active learning, students are able to engage more with their learning and become better critical thinkers. Students are not just memorizing concepts, but are able to learn the information more deeply.<sup>1</sup> Through active learning, students work in groups and learn to collaborate with others. In the Anatomy and Physiology courses, students work in groups to complete worksheets. Since some students find the worksheets helpful and others do not, this study was designed to determine if attitude affects exam grades. If student attitudes play a key role in their grades, then it will be possible to have students think positively towards active learning activities to improve learning.

## QUESTIONS

- Are students' attitudes toward in-class worksheets correlated with their midterm scores?
- Does student interaction with Learning Assistants (LAs) and the professor improve attitudes toward midterm scores?



**Figure 1.** This graph displays the degree to which students found the worksheets helpful, ranging from very unhelpful to very helpful. Most students reported finding the worksheets very or somewhat helpful.



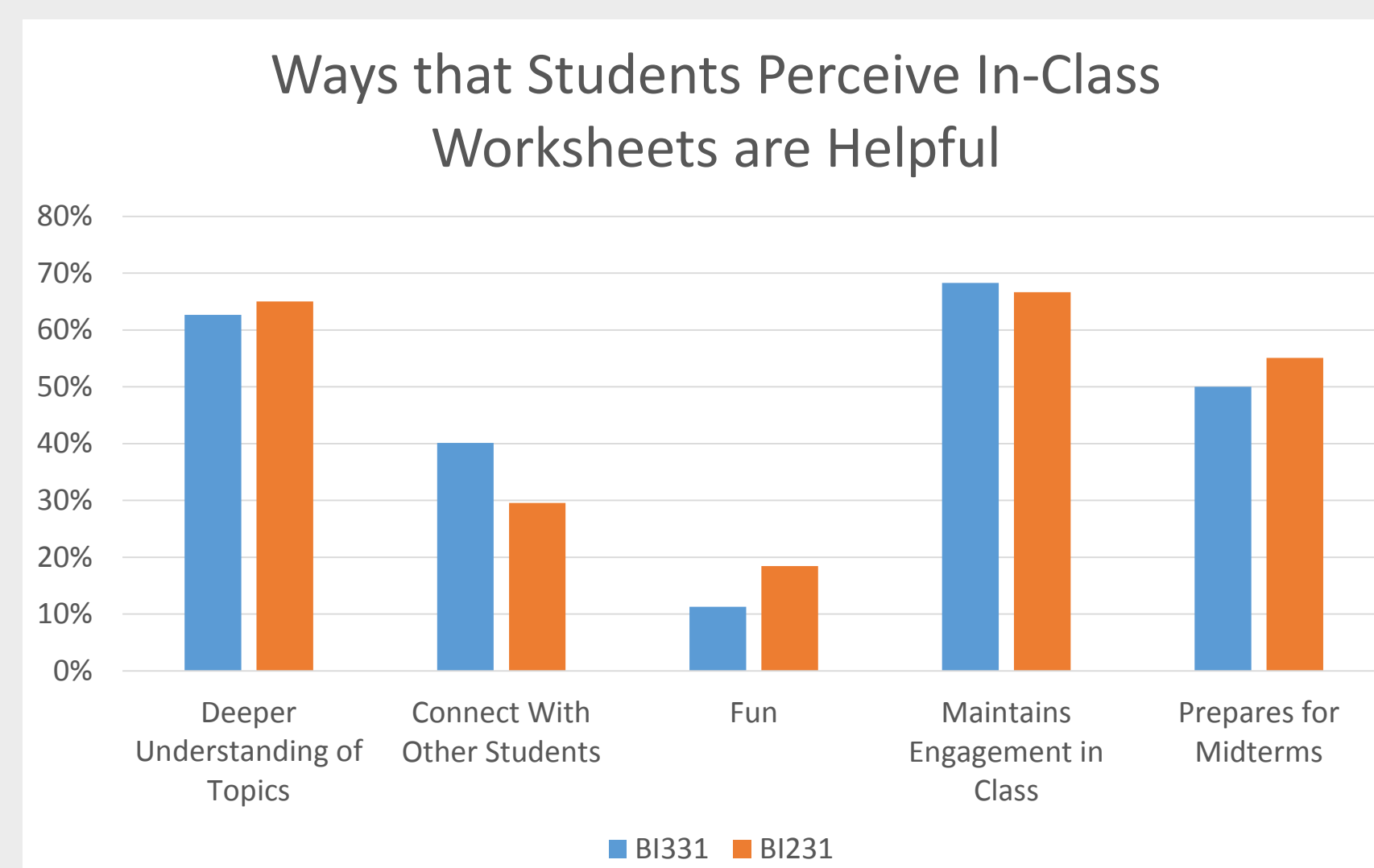
**Figure 3.** This graph displays the average exam scores for BI231 students who answered that worksheets prepared them for the exam and students who did not answer that worksheets prepared them for the exam. Students who reported that worksheets helped them prepare for the exam had significantly higher exam scores than students who did not believe worksheets helped them prepare. (SLR,  $R^2=0.1117$ ,  $p<.0001$ , DF: 3, 558).

## HYPOTHESES

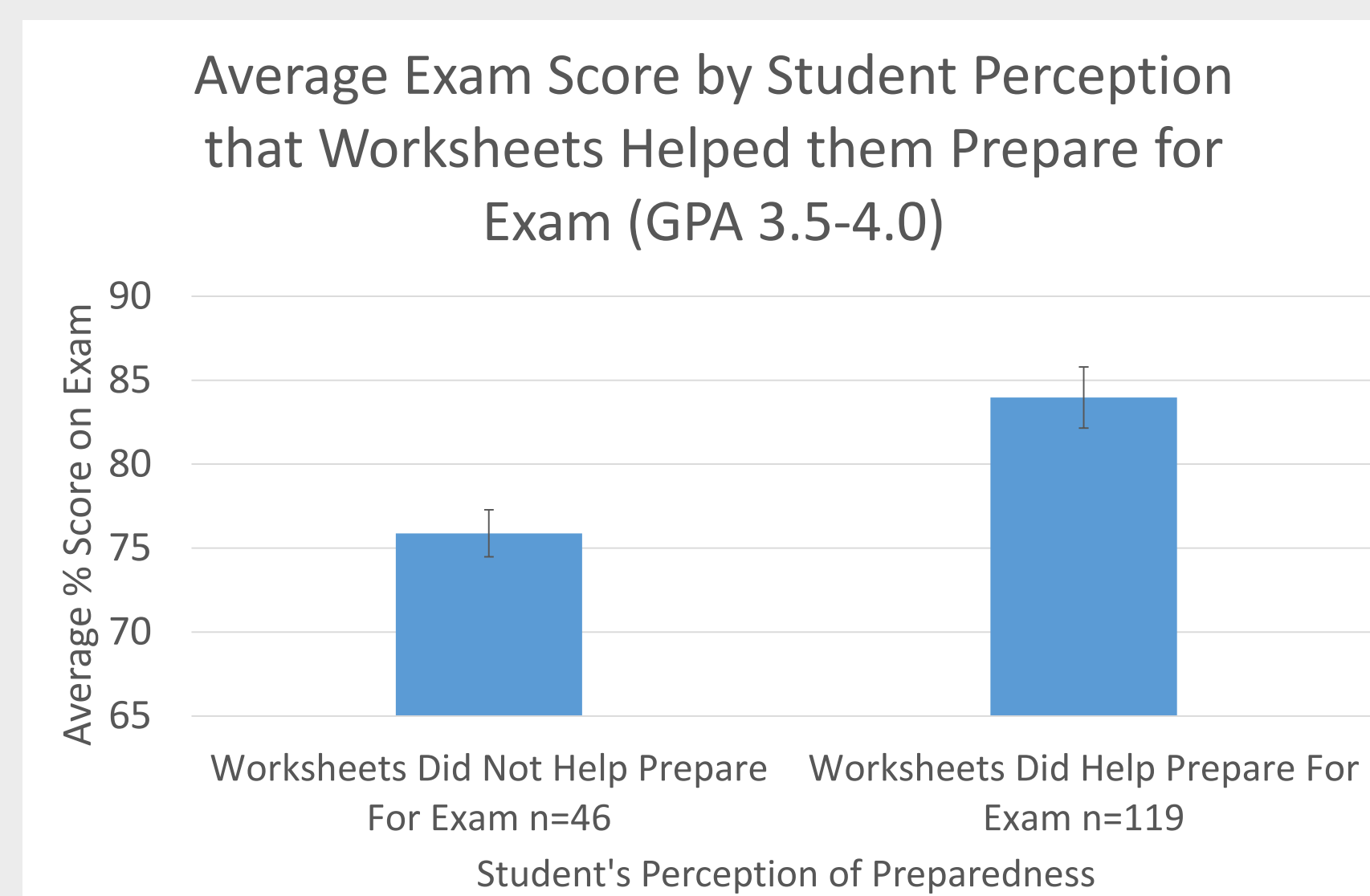
- Students who reported that the worksheets are very helpful will have higher midterm exam scores.
- Students who felt that the worksheets better helped prepare them for the exam will have higher midterm exam scores.
- Students who have higher frequencies of interaction with the professor and LAs will have higher midterm scores than those who have lower frequencies of interaction.
- Students who interact with the L.A.s more often will feel satisfied with their midterm exam scores.
- Students who reported that their interactions with L.A.s or the professor is very helpful will feel satisfied with their midterm exam score.

## METHODS OF INQUIRY

The data was obtained through an optional 6 question survey that was sent out to students in BI231 and BI331 quizzes. The questions in the survey surrounded attitudes toward worksheets, level of participation, and interactions with LAs during class. The responses available for perceptions about worksheets and LA interaction ranged from very helpful to very unhelpful. A request for midterm one scores and GPA information were also included in the questions. The GPA served as a control to compare students' performance in BI331 and BI231 to their overall academic performance.



**Figure 2.** This graph identifies the different ways that students found the worksheets to be helpful.



**Figure 4.** This graph displays the average exam scores for BI231 students with a GPA between 3.5-4.0 who answered that worksheets prepared them for the exam and students who did not answer that worksheets prepared them for the exam. When controlling for student self-reported GPA, exam averages differ for students who do not agree that worksheets help them prepare for the exam from students who do believe worksheets help them prepare, MLR,  $R^2=.3326$ ,  $p<.0001$ , DF: 11, 517.

## DATA AND FINDINGS

- Over 90% of students from each class found the worksheets to be either very or somewhat helpful (Figure 1).
- For both BI231 and BI331, there were no statistical differences between the average midterm scores for groups of students who answered with other positive statements about worksheets and groups of students who did not answer with the same positive statements (Figure 2).
- In BI 231, even after controlling for GPA, the group of students who answered that worksheets prepare them for tests received a statistically higher average midterm score than the students who did not answer with this statement (Figures 3 and 4).
- The sample size of students who answered with negative perceptions toward in-class worksheets was too small to be statistically relevant.
- For both BI231 and BI331, there were no statistical differences between the average midterm scores of groups of students who had more interaction with the professor or LAs and groups of students who had less interaction with the professor or LAs.

## SYNTHESIS

As shown in Figures 3 and 4, findings suggest that the worksheets do actually prepare students for the midterms as they are designed to. This suggests that active learning helps prepare students for midterms.

Even though over 90% of students believed that the worksheets were helpful (Figure 1), less than 50% of all BI231 students thought that in-class worksheets specifically prepared them for midterms (Figure 3). For students who did not find the worksheets helpful for exam preparation, it is possible they are more likely to have weaker metacognition. The worksheets may be perceived as generally helpful to them, but they were unable to connect the helpfulness with midterm preparation. Therefore, it is worthwhile to continually ask students to reflect on the way they learn in Anatomy and Physiology.

## NEXT STEPS

Koretsky and Brooks's study found that students tended to view active learning more favorably over time.<sup>2</sup> This could be verified within the Anatomy and Physiology classroom by deploying identical surveys about attitudes toward in-class worksheets before and some time after the first midterm. Students may view the worksheets more positively in the second survey after time has passed and those who view in-class worksheets positively before the midterm may also be more prepared for the midterm than those who only begin to view them positively afterwards.

## REFERENCES

1. Handelsman, J., Miller, S., & Pfund, C., (2007). *Active Learning*. In Scientific Teaching. NY, W.H. Freeman & Company.
2. Koretsky, Milo D., and Bill J. Brooks. "Student Attitudes in the Transition to an Active-Learning Technology." *Chemical Engineering Education* 46.1 (2012): 41-49.



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