

Flipping PHSL-P 215: A Large Enrollment Classroom Success

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Introduction

Background

- PHSL-P 215 (Basic human physiology) is a foundational course for many majors and allied health careers
- Often taught in a traditional, lecture format in a large classroom setting (>300 students)
- This style is not the most conducive to student success

Purpose

- To see the effects of converting PHSL-P 215 from a traditional lecture to a flipped classroom

Hypothesis

- Student outcomes will be better in a flipped classroom compared to a traditional format

Methods

- PHSL-P 215 transitioned from a traditional format (Fall 2022) to a flipped format (Fall 2023)
- The teaching team in Fall 2022 was only the instructor, but Fall 2023 included 10 undergraduate teaching assistants (UTAs)
- Materials for the flipped classroom needed to be developed for 53 topics. For each topic the following was created
 - Pre-class videos embedded with PlayPosit questions
 - Pre-class assignments
 - Question banks
 - Kahoot quizzes
- Before each class students were expected to-
 - Watch 1-2 short videos (8-10 min/video)
 - Complete a pre-class worksheet
 - Complete a pre-class quiz
- Class time was then used to reinforce material via active learning methods
- Exam 1 and Exam 2 scores, as well as mid-term attendance were compared between semesters
- Data was only compared during the first half of each semester
- Work was funded with a 2023 Summer Instructional Development Fellowship

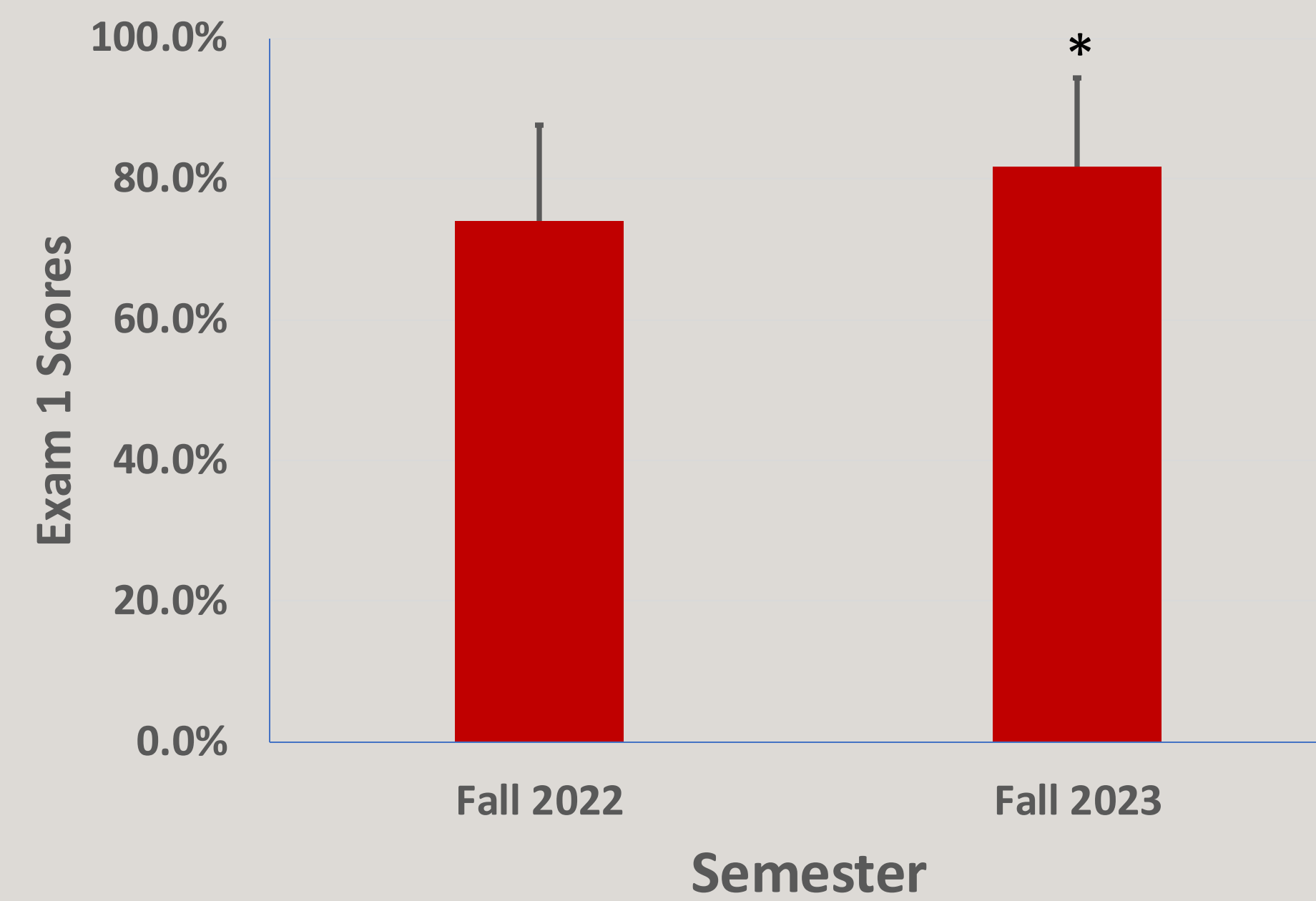


Figure 1. The difference in Exam 1 scores between traditional (Fall 2022) and flipped classrooms (Fall 2023). * indicates a significant difference between semesters, $p < .001$

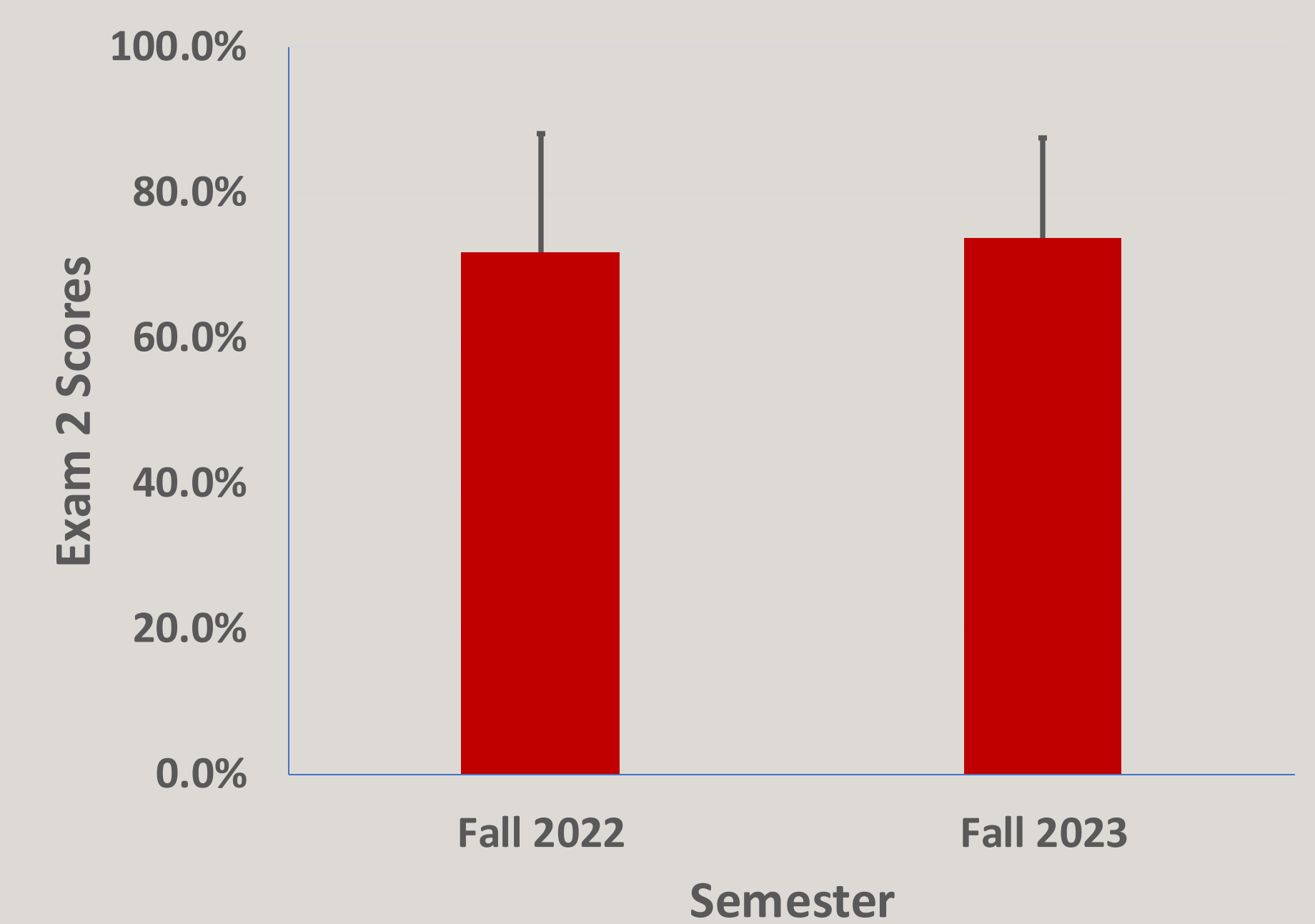


Figure 2. The difference in Exam 2 scores between traditional (Fall 2022) and flipped classrooms (Fall 2023). There was no significant difference between semesters, $p = .09$

Methods

- Both classes met from 8:00 am – 8:50 am on MTRF
- Flipped classroom had 10 UTAs who assisted with small-group activities during class
- Fall 2023 enrollment (367 students) was greater than Fall 2022 enrollment (299 students)
- Content was similar between semesters
 - Unit 1
 - Core concepts
 - Basic cell biology
 - Nervous system
 - Unit 2
 - Special senses
 - Muscular system
- Exams had different formats
 - Fall 2022 – 45 questions, 60 minutes
 - Fall 2023 – 40 questions, 50 minutes

Results

- Exam 1 scores in the flipped format ($81.7 \pm 12.7\%$) were significantly higher than in the traditional format ($74.0 \pm 13.6\%$, $p < .001$)
- There was no difference in Exam 2 scores
- Class attendance at the mid-point of the semester in Fall 2023 was ~80%, compared to ~45% in Fall 2022

Summary

- The findings from this study suggest that a flipped classroom can be effectively run in a large-classroom setting
- Student engagement appears to be higher in the flipped classroom compared to the traditional lecture
- Anecdotally students reported their learning experience was improved in the flipped classroom. They cited the number of resources and having to come to class as primary reasons

Future Directions

- See if these trends hold over an entire semester
- Quantify the effect of the UTAs in class
- Quantify the effects of specific resources on student outcomes

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