



The Effect of Immediate Feedback via Excel Template on Student Learning

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Background

- I taught at West Anchorage High School in Anchorage, Alaska. I did my research on two sections of high school physics with a total of 29 students.
- The students in my class ranged from ages 16-18 years old, were taking or had taken pre-calculus, and had moderate experience with Excel.

Introduction

I had noticed when I pass back a lab report, students often did not look past the overall grade on the front, and almost immediately discarded the report. I wondered how useful labs were to students and if the feedback given on lab reports had any impact on assessment grades.

Focus Question

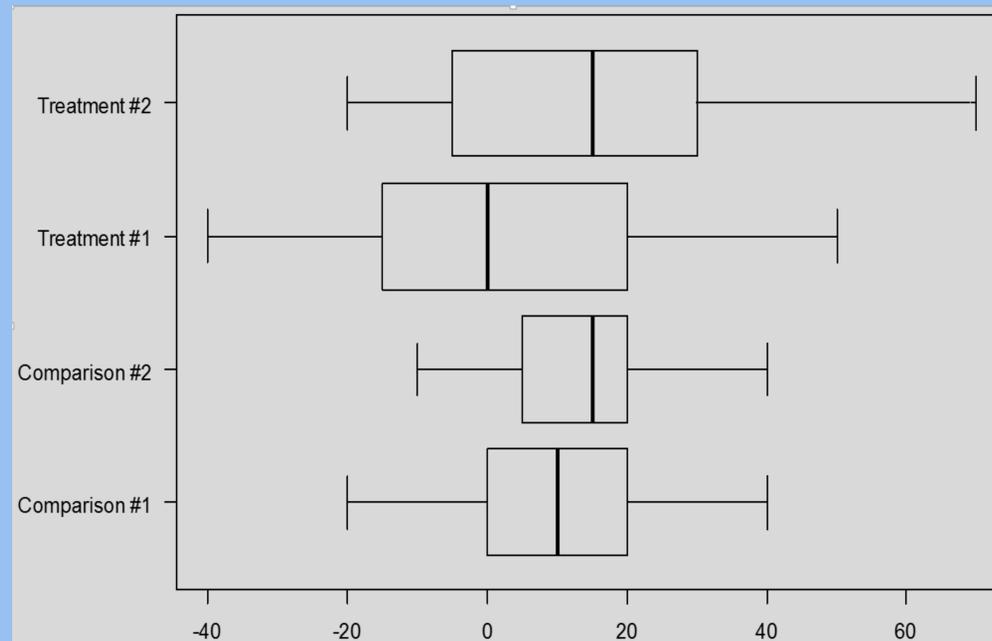
Does instant feedback on labs affect student learning and performance on quizzes and tests?

Methods

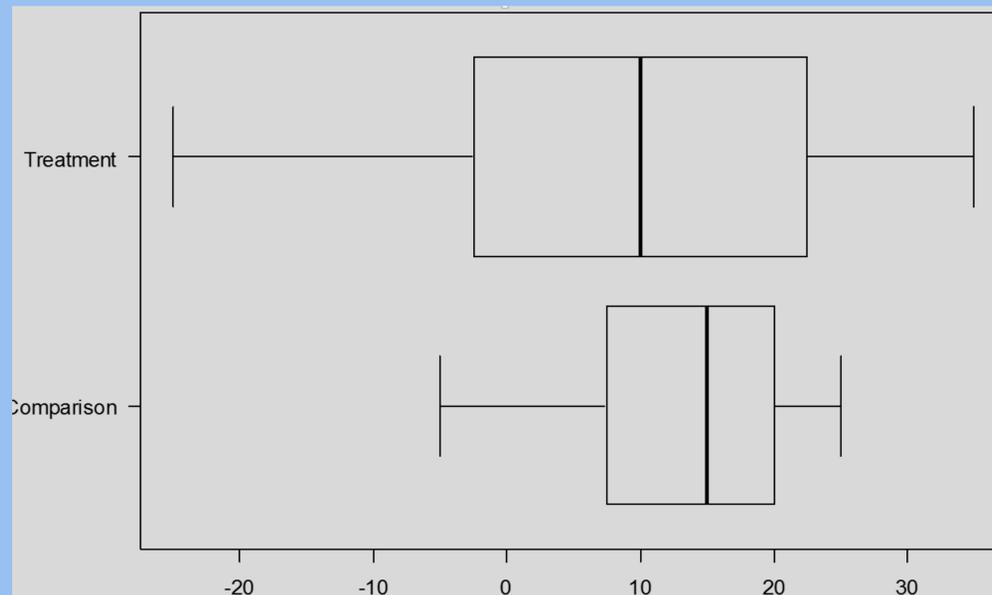
- A Pre-Study Survey was given to students to assess attitudes toward the physics class in general and towards the usefulness of labs and feedback on labs for learning physics and for doing well on physics assessments.
- Students will undergo two non-treatment units and two treatment units. Learning gains in all units will be assessed using a Pre/Post Concept Test.
- The non-treatment units will be taught with labs that use Excel templates that give no instant feedback.
- The treatment units will be taught with labs that use Excel templates that automatically indicate to students whether measurements made and calculations are correct or reasonable.

Results

Normalized Percentage Gains on Concept Inventory Tests for Two Comparison Units ($N=28$, $N=20$) and Two Treatment Units ($N=24$)



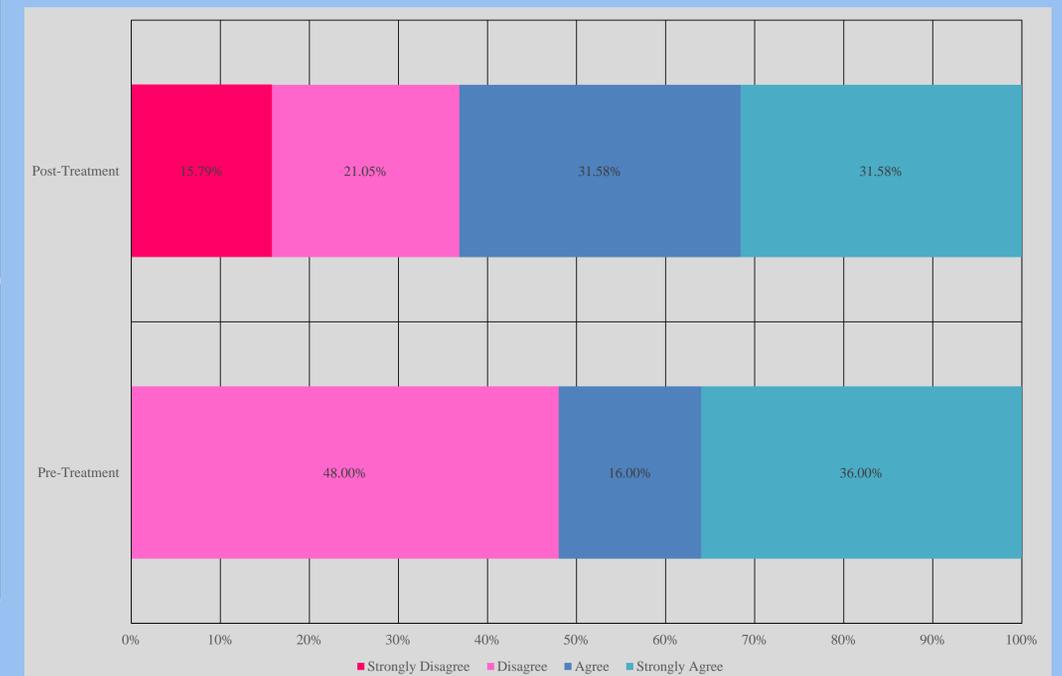
Average Normalized Percent Gains for Students Who Completed Both Comparison Units ($N=20$) and Both Treatment Units ($N=19$)



Student improvement on Concept Inventory Tests during treatment units was not statistically higher or lower than student improvement on Concept Inventory Tests during comparison units.

Results (continued)

Student Responses to Survey Question *The Feedback I Receive on Labs Helps Me Understand the Topics I Am Learning in Physics*, ($N=25$ for pretreatment and $N=19$ for posttreatment)



Distribution of student responses as to whether labs helped them learn physics showed improvement over the course of the research project. The distribution of student responses to all other survey questions regarding physics class and labs did not significantly change.

Conclusion

In this study, instant feedback did not help students do significantly better on summative assessments.

My observations indicated Excel template helped free up my attention during labs for students who had more difficulty resolving their problems. Grading of laboratories was also much easier.

Student survey and interview responses indicated that the labs, though perceived to be helpful to learning physics, were not seen as relevant to studying for summative assessments.