Evaluating **Assessment Tools *for* Learning** in a High School Science, AP Physics, Classroom

ABSTRACT

This research studies if the effect of two different assessment strategies, (1) Documented Problem Solutions and (2) Performance-Based Assessment. Outcomes are measured with College Board AP Physics 1 tests. This study takes place in a High School AP Physics course that that utilizes inquiry and NGSS learning strategies.

INTRODUCTION

As a teacher who is new to teaching AP Physics, my goal is to provide students with meaningful science experiences. In this study, I worked to support my students to solve problems by analyzing the steps and discussing the process to provide a foundation to retain the information and solve problems that build in complexity.

FOCUS QUESTIONS

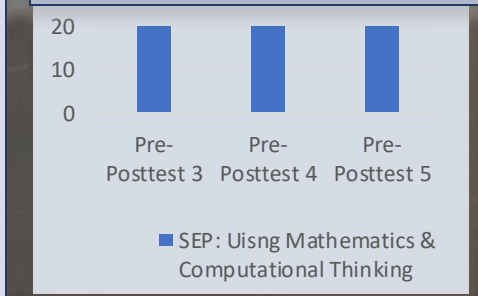
(1) Does D*ocumented Problem Solutions* improve students' test scores on AP summative exams?

(2) Do *Performance-Based Assessments*, using NGSS science and engineering practices, improve students' test scores on AP exams?

METHODOLOGY

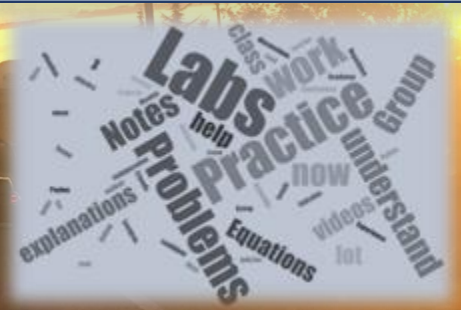
To find tools that help my students retain information for learning physics. I used the pretest posttest method to measure student outcomes. I started with a baseline called the non-treatment then implemented two treatments which are two assessment strategies identified in my focus question. Data was collected with multiple-choice question tests and surveys. In this study, my intentions were to test various assessment tools *for* learning physics. The desired outcome was to find strategies that would support students passing AP Physics exams, which may translate into college and career readiness. In addition to surveys and test scores, I also compared the exams utilized to the NGSS 3-dimensions since my classroom routines encompass NGSS.

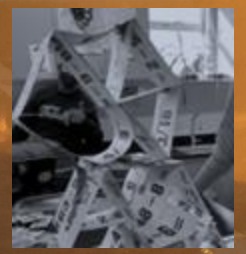
NGSS Comparison below, 20 multiple-choice questions (N=21).



RESULTS

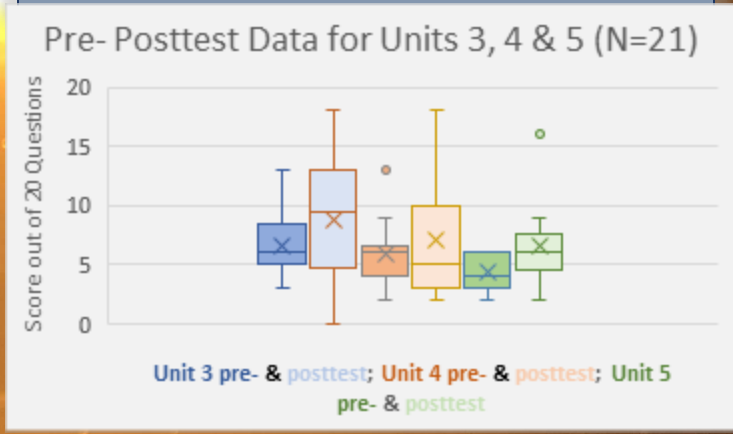
The overall class data show the most improvement in the posttest results during the non-treatment unit tested. The posttest results for Documented Problem Solutions show less improvement and Performance-Based Assessment outcomes show so little improvement that no student passed the exam. Although, the medians show the same posttest increase on the non-treatment as on the Performance-Based Assessment outcomes. Students indicated that laboratory work was the most useful tool when learning physics.





CONCLUSION

My students did not improve their test scores on AP exams after the implementation of the two assessment strategies identified in my focus question. Although, there is evidence that Performance-Based Assessment did impact student outcomes; because the mean did increase. This strategy was tested during the momentum unit which was new information for students in comparison to the circular motion unit tested during the non-treatment because it's information students have previously seen. And there is strong input from students liking the process of Documented Problem Solutions identified in the Likert-Scale Surveys.



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