Implementing Active Learning in High School Physical Science

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Introduction

Student engagement is the single most important indicator for learning and I seek to find an instructional method that helps students get engaged. Relevant research and literature indicates that active learning methods is the way to achieve high levels of student engagement and, therefore, learning. In this research I assessed the student self reported level of cognitive engagement during lesson adopted from a Cambridge Physics Outlet (CPO) curriculum. In addition, the students' attitude towards lab investigations and learning science were assessed. Overall, The results indicate that students can benefit from active learning methods with transformative teaching implications.

Research Questions

1. How does active learning with the CPO curriculum in high school physical science impact student engagement?
2. How does active learning affect the students' cognitive engagement compared to passive learning?
3. What are the students' attitudes toward learning science and lab activities?
4. How does implementing an active learning method affect my role as a teacher?

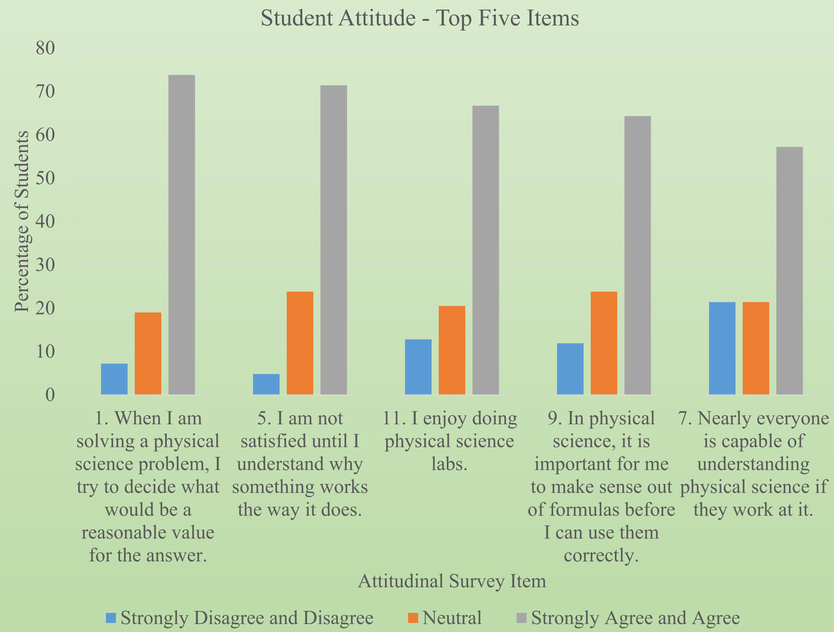
Treatment

- 30 hands-on exploration activities or laboratory investigations
- Physically interacted with CPO equipment from Car and Ramp, Simple Machines, Rollercoaster, Electricity and Magnetism, Chemistry Models kits
- Integrated the 5E model of instruction outlined in the CPO teacher guide.
- Utilized CPO student guides
- Enabled student participation within peer groups
- Significantly restricted direct instruction

Research Question	Data Source	Data Source	Data Source
Cognitive engagement	ECAT	Field notes	Interview
Comparison to passive learning	ECAT	Field notes	Interview
Attitude toward labs and learning science	Attitudinal survey	ICAT	Interview
Personal impact as a teacher	Reflective journal	PCAT	Interview

Sample

Two high school physical science classes; 42 students; 25 female and 17 male. Overall, the participants were 86.4% Black, 6.8% Hispanic, 4.5% White, 2.3% American Indian and 47% of the students at the school are from low-income families. Additionally, 70.4% were in ninth-grade, 18.2% tenth-grade, and 11.4% eleventh-grade.



Conclusion

- Two out of three students reported being cognitively engaged.
- Most students enjoyed doing the labs once they became accustomed to them.
- Teaching implications involves using deliberate practices aiming to increase the students mental activity.