

Does the Teaching/Learning Interview Provide an Accurate Snapshot of Classroom Learning?

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1. Introduction

Research Question: How does data from students completing a pulley curriculum in an interview setting compare with data from students completing the same curriculum in a laboratory setting?

Context of Study: CoMPASS pulley curriculum

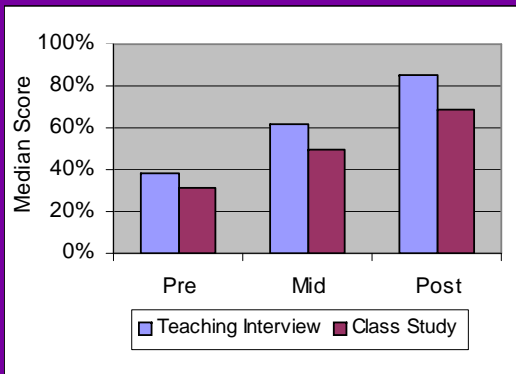
2. Methodology

Some students completed the pulley curriculum in a teaching interview room, others in a conceptual physics lab classroom.

Teaching Interview	Classroom Study
N=12	N=132
Paid \$25 for participation	Part of normal laboratory
Two hour intervention	Two hour intervention
Interview Room	Laboratory
Alone or with partner	Groups of 3 or 4 students
Researcher facilitates	Researcher & TA facilitate
Audio& video recorded	No audio/video recording
Worksheets collected	Worksheets collected

3. Quantitative Analysis: Overall Score

- Mann-Whitney test used to compare scores
- No statistically significant difference between pre-test scores for the Teaching Interview (TI) & Class Study (CS) ($p = .15$)
- TI scored significantly higher on mid-test than CS ($p < .001$, $r = .289$)
- TI score significantly higher on post-test than CS ($p = .013$, $r = .206$)

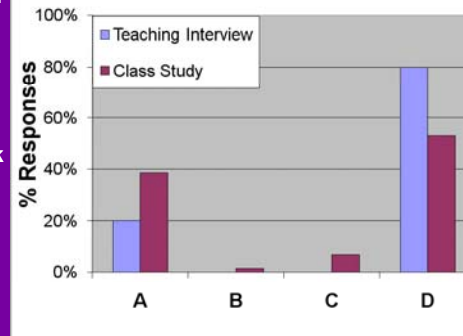


4. Quantitative Analysis: Specific Questions

Largest performance spread in three questions below

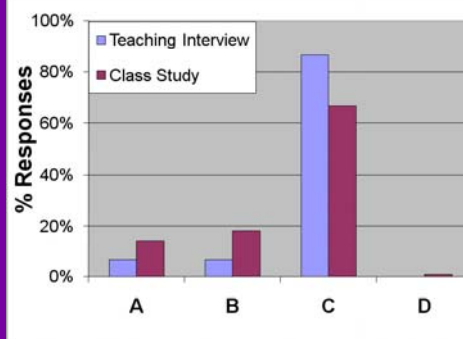
Q9: Identify which of three pulley setups would require the most work to lift the same load to the same height.

- A. Single fixed
- B. Single compound
- C. Double compound
- D. All need equal work



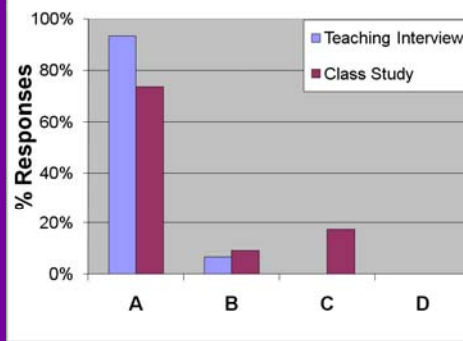
Q13: Compare the work (W) needed to lift an object with its potential energy (PE) once lifted.

- A. $W > PE$
- B. $W < PE$
- C. $W = PE$
- D. Not enough info



Q2.1: What happens to the distance the rope needs to be pulled to lift an object if pulley changes from single fixed to single moveable?

- A. Increases
- B. Decreases
- C. Stays the same
- D. Not enough info



5. Qualitative Analysis

- Used phenomenographic approach [3] to analyze students' responses to open-ended worksheet questions
- Focused on questions related to post-test

Categories	Teach. Int.	Class Study
Did not change	43%	61%
Changed slightly	16%	5%
Changed	35%	29%
Changed for some	0%	3%
Other	6%	2%

Related to Q9: How does the work required to lift an object a certain height change when the pulley setup is changed?

Related to Q13:

How does the work (W) done to lift an object compare to its potential energy (PE) once lifted?

Greater variability in CS responses.

Categories	Teach. Int.	Class Study
Work = PE	53%	53%
Work almost = PE	6%	9%
Work > PE	21%	7%
Work < PE	6%	3%
Work, PE different	9%	4%
Depends on system	0%	3%
One constant	3%	15%
Other	0%	4%

6. Summary

- Qualitative study results do not neatly overlap with quantitative study results. While TI students did better on post-test, CS students did as well or better on worksheet questions.
- Main implication: instructional materials tested in a small scale environment may not work the same in a larger classroom.

7. Future Work

- Identify additional factors that may have affected the results: Different incentives? Different student-researcher ratio? Different group size?
- Videotape students using curriculum in classroom setting
- Validity and reliability studies of the tests are in progress