

# How Does Classroom or Interview Room Environment Affect Research Data?

## PER Methods & Assessments

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### 1. Introduction

- The teaching interview [1] aims to understand how interventions affect students' thinking.
  - ✓ Intended to model natural teaching environment.
  - ✓ Researcher typically asks probing questions & provides scaffolding which shapes student thinking. In this study, interviewer facilitated activity but did not ask probing questions or offer scaffolding.
  - ✓ 1 to 4 students working with researcher.
  - ✓ Usually occurs in smaller room like an office.
  - ✓ Video and audio recorded. Equipment is visible.
- We investigate the differences in student understanding as they complete an activity during a teaching interview as compared to a laboratory class.
- We look for implications that these findings have on classroom instruction.

### 2. Methodology

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

- All students completed the pulley section of the CoMPASS curriculum [2].
- **CoMPASS challenge:** Design the best pulley setup to load a pool table into a van.

- |                                      |                                     |
|--------------------------------------|-------------------------------------|
| 1. Pre-test                          | 6. Mid-test                         |
| 2. Brainstorm about challenge        | 7. Virtual (or Physical) Experiment |
| 3. Use CoMPASS hypertext system      | 8. Open-ended summary questions     |
| 4. Physical (or Virtual ) Experiment | 9. Post-test                        |
| 5. Open-ended summary questions      |                                     |

#### ➤ Analysis:

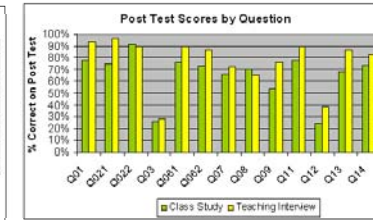
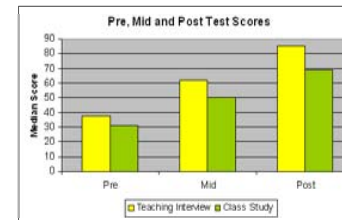
- Quantitative: Performance on multiple choice test
- Qualitative: Phenomenographic analysis of written responses [3]

### 5. Teaching Implications

- Smaller focused work settings such as that of the teaching interview may help students gain more understanding than a classroom lab setting.
- Formative assessment questions answered during group work may not accurately predict individual understanding as measured by a mid or post-test. Strategies to help students individually construct knowledge during group work could help alleviate this problem.

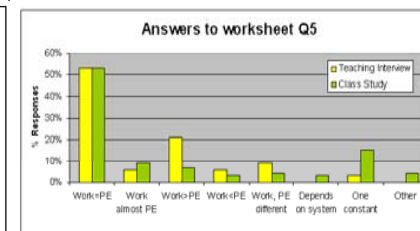
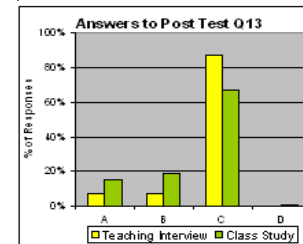
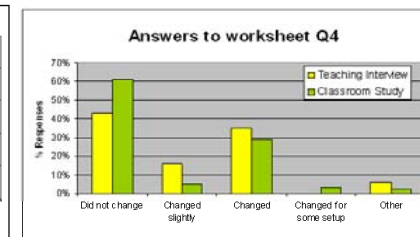
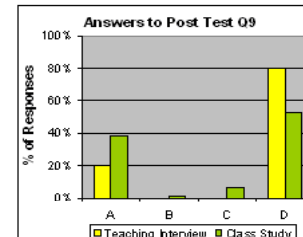
### 3. Pre, Mid and Post Results

- No statistically significant difference between the pre-test scores
- Teaching interview group scored significantly higher on the mid-test
- Teaching interview group scored significantly higher on the post-test



### 4. Post Test vs. Worksheet Summary Questions

- Looked at worksheet questions that tested the same content as pre/mid/post questions with largest difference between groups.
- Pre/Mid/Post Q9 = Worksheet Q4
- Pre/Mid/Post Q13 = Worksheet Q5
- Students in classroom did as well or better than teaching interview group on selected worksheet questions.



### References

1. P.V. Engelhardt, et al. *The Teaching Experiment - What it is and what it isn't in Physics Education Research Conference*, 2003. 2003. Madison, WI.
2. S. Puntambekar and A. Stylianou, *Instructional Science* **33** 451-481 (2005).
3. F. Marton, *Journal of Thought* **21** 29-39 (1986).