Concept categorization analysis: Comparing verbal and written data

Dyan L. McBride
AAPT Winter – February 15, 2008

Goals of this small study

- How can we adapt an interview protocol for a large-lab setting?
- What limitations exist in the lab setting?
- Is there a significant difference in the data?
  - How much data we get
  - Richness of the data

Why it’s valuable

- We often move toward an “implementation” of research protocols
- The professor asked to use our materials

Data Collection - Participants

*Done within a larger study

- Algebra-based physics, pre-instruction
- Identical protocols
  - One set: verbal, with researcher
  - One set: written, in lab

Analysis Technique

Concept Categorization – Lawson, Nieswandt

- Concept Types
  - Descriptive
  - Hypothetical
  - Theoretical
- Concept Links
  - Different levels
- Unlinked Concepts

Results – Quantitative Trends
Results – Quantitative Trends

- Verbal participants were higher in nearly every category – much higher in some categories.

Results – Qualitative Trends

- Biggest difference in Prediction/Testing
  - Questionable Prediction Phases
    - Not always a real prediction?
    - No explanations for prediction
    - Written in past tense
  - Same data, just less
    - No significant difference in the types of concepts students used
    - No significant difference in their level of correctness

Conclusions

- Larger body of data than possible with verbal in-depth interviewing
  - Not quite as rich
- Reinforced previous (verbal) results
  - Consistent with prior data
- Collecting written data was worthwhile

Thank you!
dyanm@ksu.edu
dzollman@phys.ksu.edu