Students’ Perceptions of Case-Reuse Problem Solving in Algebra-Based Physics
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BACKGROUND
- Problem solving important in Physics.
- Programs combining interrelated strategies are more effective than single-strategy programs.
- We combined Concept Mapping² & Questioning² with Case-Reuse².
- Objectives:
  - Gauge students’ perceptions of strategies -- purpose, ease-of-use and value.
  - How these compare with traditional strategies that they may already use.

METHODOLOGY

RESULTS
- No statistically significant difference between groups on transfer tasks.

THEORY
- Case Based Reasoning (CBR): Using analogies to solve real-world problems.
- Case-reuse promotes CBR using problem pairs sharing deep similarities.
- Case-reuse used with two strategies: 'Questioning’. Answer questions requiring different levels of knowledge. (Fig. 1)
- ‘Structure Mapping’: Use a visual representation showing functional connections of quantities. (Fig. 2)
- Strategies used with problem pairing.

REFERENCES

CONCLUSIONS
- Overall: Students find strategies are user-friendly and helpful.
- Questioning strategy: Tendency to answer questions using equations.
- Structure Mapping strategy: Inability to see value of paired problems.
- Future Work: Adapt, implement & test strategies in algebra-based physics class over long term.

FIGURE 1: Example of Questioning Strategy

FIGURE 2: Example of Structure Map

FIGURE 3: Interview Problem