

The Case Method to Learn Physics Through an Engineering Case

Luis Jorge Benítez Barajas

National Polytechnic Institute of Mexico

Abstract

Conceptual understanding is essential when learning engineering principles. To this end, the Case method is considered as a strategy and its objective is to apply the method with the IGAA model: individual activity, Case reading; focal groups; plenary; anecdotal logs; assessment by judges of the dimensions of understanding; diagnostic and verification surveys of the experimental and control group. When implementing the method, the judges evaluated the discussion in the plenary, with high levels of comprehension. When evaluating logs, the results showed medium and high levels. When implementing diagnostic surveys, similar levels of preconceptions were observed in both groups. When comparing results of verification surveys, higher levels of comprehension were observed in the experimental group than in the control group; the method favorably impacts comprehension through dialogic socialization. But it is rarely applied in engineering. The model is effective for implementing and qualifying Cases, due to its systematic process that improve the dimensions of comprehension. It can be replicated and related to learning through inductive reasoning.

Keywords: active learning; conceptual understanding; inductive reasoning; Socratic dialogue; Structured rational thinking