

# The Case Method for Conceptual Comprehension in Physics and Engineering

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## Abstract

The objective of the research was to demonstrate that the Case Method can improve conceptual understanding in engineering. The main research question was: Could the Case Method improve the comprehension of physics concepts when studying engineering?

To support the question, were addressed theories related to:

The Case Method; the inductive thought; the Structured Rational thought and socialization of knowledge.

Then the following hypothesis raised: With the Case Method, better comprehension of physical concepts. The methodology of 4 phases: 1) The method was presented and teams of students were formed; 2) The professor design the Case; 3) Reading individually by the student; where a brief approach was made by reading the assigned guide questions; 4) Dialogue of teams; in which a detailed reading was carried out, the problem was defined, alternatives were generated, decision criteria was made, effective alternatives were evaluated, an action plan was developed.

The results were: When implementing diagnostic surveys with dichotomous questions, similar levels of preconceptions were valued in both groups. When comparing results from verification surveys based on inferential questions, higher levels of understanding were valued in the experimental group than in the control group.

While discussing the case, observer judges assessed students' conceptual understanding with high levels, using an 8-dimensional rubric. Using the dimensions outlined in the anecdotal logs, judges gave high levels of assessment of the written narratives about the case.

Conclusion, the Case Method favorably impacts learning through collaborative work based on triggering questions; development reflection of reality that carry out metacognition.

**Keywords:** hermeneutics; inductive learning; logic; maieutics; methodical dialogue; structured rational thinking