The Case Method as Structured Rational Thinking for Learning Physics Principles in Engineering

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ABSTRACT

Conceptual understanding is essential to learn physics principles, for this it is advisable to develop a method of thinking. The Case Method can develop it hence the objectives of research: test the viability of implementing Rational Thought and the Case Metod in classrooms and answer the questions: how does rational thought modify in students conceptualization? and how the Case Method modifies their thinking scheme for learning disciplinary principles? The first stage consisted of theoretically basing classical pedagogy, with the rational thought of ancient Greece and its derivation in scientific thought. For test design, an interaction matrix is proposed to order and interpret data that reflect the level of conceptualization, according to types of structured thought: logical, methodical and narrative; For each type of thought, dimensions of content, purpose and structure are evaluated. In the second stage implement the method with the IGBE model imply: individual activity, Case reading; focus group; plenary; anecdotal log; evaluation judges dimensions understanding; diagnostic surveys and verification of experimental and control groups.
The results of first stage: methodological, theoretical and test design foundations were achieved supported by preliminary conclusions. Secondly when implementing the method, the judges evaluated plenary discussion with high levels of understanding. 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 from verification surveys, higher levels of understanding were observed in the experimental group than in the control group; The method favorably impacts understanding through dialogic socialization.

Keywords: active learning; case methodology; inductive reasoning; narratives; Socratic method