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SP - (16181) - ANALYSIS OF SEMANTIC DENSITY VARIATION IN THE QUANTUM MECHANICS TEXTBOOKS

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Short Abstract

Many of the difficulties encountered by students when studying physics are related to their particular language (including the question of mathematical formalism) and the nature of the knowledge made available by the physical sciences. In the specific case of teaching quantum mechanics, these difficulties are conceptual structure that contradicts the intuition; advanced mathematics formalism; description of unobservable phenomena and defficiencies in teacher professional development. The objective of the work is to provide subsidies to understand, through the semantic analysis of chapters of quantum mechanics textbooks, how these materials explain the wave function in quantum mechanics. The dimension of the Legitimation Code Theory (LCT) that is applied to analyze the written language of three book chapters widely used quantum mechanics books is the semantic density. Semantic density is one of semantic dimension of Legitimation Code Theory (LCT) which refers to the level of complexity of the meanings in the social practice. The chosen chapters refer to the explanation of the wave function, fundamental to the studies in quantum mechanics. The work will present a new translation device for the semantic density applied to physical knowledge, generating graphs with the variation of semantic density versus text clauses. Tables were also built and indicate the percentage of relationships established in the text with classical and quantum concepts in physics, , within each of the levels of semantic density. The analysis data suggests that there is no consensual approach in quantum mechanics textbooks to teach quantum physics. Each of the books take different approaches to deliver the quantum physics knowledge, especially the explanation of wave function. There is a need for a unique didactic approach in quantum mechanics textbooks facilitating student learning.