

ANALYSIS OF THE RELATIVISTIC DYNAMICS APPROACH IN HIGH SCHOOL AND UNIVERSITY TEXTBOOKS

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RELEVANCE OF RESEARCH AND METHODOLOGY

School books are a central element of the didactic transposition (Chevallard, 1985). However, transpositive phenomena are not evident to science communicators at all levels: neither to those who write the books, nor to users, teachers and students.

This research studies the main justifications for revising the classical concepts of Momentum, Mass and Energy, in the teaching of relativistic dynamics in 18 secondary and basic university textbooks. An inductive categorization is carried out analyzing the influence of the educational level to which the texts are directed in the justifications for the review of classical dynamics and its strategies, in addition to characterizing the use of experiments, images, and the relevance of studying the relativistic dynamics exposed by the different texts.

MAIN RESULTS AND CONCLUSIONS

As shown in Figure 1, there is evidence of a preference for university textbooks (UNI) to review in the first instance the concept of momentum (P) for the subsequent analysis of dynamic magnitudes, while in high school textbooks (SECU) the concepts of quantity are reviewed momentum (P), mass (M) and energy (E) equally for the introduction of relativistic dynamics.

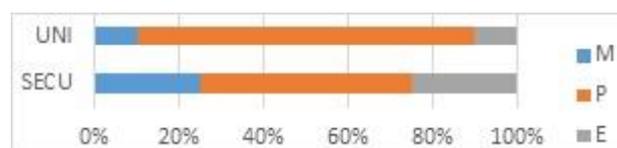


Figure 1. Educational level-Central concept to review

It is also evident that there is no difference between college and high school textbooks in the use of images and experiments to convince the reader. This results in this section of the texts not being as attractive to high school students as others and leading to a greater distance between "knowing how to teach" and "knowing taught". This research is important for the future development of didactic sequences for the teaching of relativistic dynamics, as well as for the elaboration of appropriate didactic materials for its learning.

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