

DISCIPLINE-CULTURE – A NEW PARADIGM OF KNOWLEDGE REPRESENTATION IN SCIENCE EDUCATION

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Abstract

The currently prevailing paradigm of knowledge representation generally, and in science education in particular, can be titled as Disciplinary. In accordance with it, science textbooks and lectures in schools and university science departments normally present disciplinary content in a linear unfolding manner, from simpler to more complex. The disciplinary curriculum is usually comprised of elements traditionally transferred from the past, somewhat squeezed after addition of new elements due to the scientific progress. This presentation is essentially deficient by the commonly lacking conceptual hierarchy, disregarding theory based structure of mutually related elements, and ignoring scientific discourse involving conceptual alternatives to the presented subject matter. These deficiencies lead (as stated by cognitive psychologists) to the low efficiency of students' learning and their frequent misconceptions, ontological and epistemological (the nature of science). The mentioned deficiencies are treated by the new paradigm of Discipline-Culture, we have suggested. Within this paradigm, the new curriculum is structured in fundamental theories possessing tripartite structure nucleus-body-periphery. Besides justification and naming the ways of implementation already tested empirically, I will exemplify the new paradigm by a summary lecture following a traditional disciplinary course of optics or mechanics that act as a delay organizer of disciplinary knowledge. My claims draw on the cumulative research and development documented in several publications and textbooks. The paradigm and its products are presented in the recently published book*. The latter presents science as a culture which learning provides the students with the pleasure of understanding.

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