

ZMATH 2011a.00925

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Generative role of experiments in physics and in teaching physics: a suggestion for epistemological reconstruction.

Sci. Educ. (Dordrecht) 15, No. 1, 31-54 (2006).

Summary: In physics teaching experimentality is an integral component in giving the starting point of knowledge formation and conceptualization. However, epistemology of experiments is not often addressed directly in the educational and pedagogical literature. This warrants an attempt to produce an acceptable reconstruction of the epistemological role of experiments in physics by drawing insight from history and philosophy of physics. Towards that end, the experiments' role in the 19th-century physics is discussed. We propose here a reconstruction, which is based on the idea that in epistemology of experiments the inductive-like generative justification of knowledge is central. A generative view makes it possible to retain those aspects of experiments which make them purposeful for learning and can give a starting point for students' own construction of knowledge. The reconstruction also helps to conceive the experiments with their correct historical role and helps to bring back the generative use of experiments in teaching, which, after all, has never vanished from the practice of physics.

Classification: M50 E20

Keywords: epistemology of experiments; generative justification

doi:10.1007/s11191-005-3199-6