

PHILOSOPHY OF SCIENCE AND ITS IMPLICATIONS FOR SCIENCE AND MATHEMATICS EDUCATION

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Abstract

The nature-of-science debates are a good illustration of the impact of philosophy of science on science education. However, current trends in philosophy of science allow us to go beyond this debate and focus instead on the practices of science. This paper argues for a stronger engagement with scientific practices as part of science pedagogy. One such practice that is discussed here is that of language-use in science, illustrative of the extremely complex relationship between language and science. In particular, it is argued that inscriptive and discursive strategies present in science should be communicated to the student in order to allow the student to understand the uniqueness of scientific texts. This enhances a student's capacity to read and write scientific texts. Some of these inscriptive strategies, which are of particular relevance to teaching mathematics, are discussed. Pictorial and visual modes of cognition are also an integral part of these writing strategies and thus proper teaching of the reading and writing of science will have to emphasise and strengthen different cognitive abilities. The paper concludes by addressing a particular problem in the link between philosophy of science and science education. This has to do with the fact that philosophy of science is almost completely drawn from the Western philosophical tradition. The Indian rational philosophies have developed sophisticated theories of doubt, debate, knowledge, truth, logical inference and philosophy of language, among other topics. Some of the insights from these traditions are much closer to the practice of science than the formal, logical systems arising from Greek philosophy. The last section is a brief account of how Indian philosophy could be relevant for science education, particularly in the teaching of argumentation and the relationship between logic and empirical data.