

Integrating mathematics and science: designing an operational model for teachers

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Abstract

Integrating mathematics and science has been of interest for teachers and researchers for several years. Studies on the subject report many positive effects for both teachers and students. Many curricula also recommend this integration. However, despite the numerous research studies on the subject, there is still a conceptual vagueness surrounding this notion, both in terms of its definition and its operationalization in the classroom.

In our research we wanted to first clarify the concept of integration from a theoretical perspective and then, provide teachers with tools allowing them to foster this integration.

A first relevant tool for teachers would be a model of integration that would guide and support them in implementing integration. Some integration models have been developed, but they are not very operational for teachers and are not sufficiently developed to analyze with rigor and precision the level of mathematics-science integration of a learning situation.

In the context of a vast research project aimed at implementing mathematics and science situations with elementary school teachers and students, we have developed a model of integration from math and science. Our model allows a more accurate and deeper estimation of the level of integration and is the first to allow the evaluation of the quality of the integration of situations more accurately. This model is mainly designed to perform an a priori analysis of the situation before implementing it in the classroom.

Our objective in this paper is to present that model and the theoretical foundation that support it.

Keywords: integration; interdisciplinary; learning; situation; teaching