



CONFERÊNCIA PLENÁRIA

REASONING AND SENSE MAKING AS THE FOCUS FOR MATHEMATICS EDUCATION: WHAT THE RESEARCH TELLS US

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As a part of its continuing efforts to promote high standards in mathematics education, the National Council of Teachers of Mathematics (NCTM) in the U.S.A. “Focus in High School Mathematics: Reasoning and Sense Making” in 2009. This publication builds on NCTM’s earlier Standards documents, including “Principles and Standards for School Mathematics” (2000) which argues that “process standards” must be emphasized in addition to “content standards.” The proposed emphasis on reasoning and sense making was built on an analysis of what students need to succeed in mathematics, as well as in their future lives (cf. Ganter & Barker, 2004; Programme for International Student Assessment, 2007; American Diploma Project, 2004).

The document proposes that students develop “mathematical reasoning habits” following the work of Pólya (1952, 1957), Schoenfeld (1983), Cuoco et al. (1996), and Harel and Sowder (2005). Rather than prescribing specific content to be taught, the publication goes on to demonstrate how reasoning and sense making can be built across five content domains, referencing research that has been done in those areas. For example, while learning to use algebraic symbols is often viewed as a primarily syntactic, procedural process, the section entitled “Reasoning with Algebraic Symbols” focuses on the importance of students developing understanding of algebraic symbols and being able to use them as a part of mathematical reasoning, following the research of Radford & Puig (2007), Kaput et al. (2008), and others who have looked at the development of symbolic algebra. “Reasoning with Functions” argues that it is “one of the cornerstones on which a well-developed understanding of mathematics is built” (p. 53). Other content areas addressed include number and measurement, geometry, and statistics and probability.

In addition to considering the research foundation for a proposed focus on reasoning and sense making, this talk will consider the potential impact of taking such an approach on continuing research in mathematics education, as well as what is needed to successfully implement this new direction for mathematics education in classrooms across our country.