Math Education

Subjects: Education & Educational Research

Contributor: Ana Barbosa

Problem solving has been a prominent field of research in mathematics education for several decades; however, it is still a current trend, due to the relevance of this theme in the teaching and learning of mathematics, across all grade levels and around the world. The importance of problem solving has taken on new contours, either by being considered as a central element of mathematical literacy and competence, or by the recommendations of its cross-curricular integration. Further, problem solving is constantly being mentioned as a highly valued 21st century skill, along with others like creativity, critical thinking, communication or collaboration. Parallel to problem solving comes problem posing. It is a more recent field of research, still in deep development, that has strong connections with creativity and critical thinking. Despite advances in research on mathematical problem solving, new questions and contexts arise that justify further investigation, such as challenges for (future) teachers and students; problem posing; creativity; articulation with other abilities; connections with other disciplinary areas; formal vs. nonformal education; relation with technology; and articulation with the affective domain.

mathematics education problem solving tasks creativity affect non-formal education assessment textbooks

1. Definition

The Special Issue on Math Education and Problem solving intends to be a contribution for the research community and for teachers in general, sheding light into the approach to mathematical problem solving at all grade levels.

2. Introduction or History

The special issue includes studies of different nature with different participants, students from all grade levels and future teachers, that focus on the importance of mathematical problem solving and problem posing. Problem solving still is as a central goal of mathematics learning in the twenty-first century; it will eventually be necessary in the lives of all citizens, and its approach must be rethought in the classroom. This fact results from the growing demand for future professionals to develop higher order skills. This change coincides with the objective that all students have access to an education that emphasizes creativity, innovation and problem solving. More recently, several researchers acknowledge that little progress was made in research about problem solving. Research in the area has diminished over the past 30 years and the existing research is not cumulative for the lack of a theoretical basis and because the field of mathematics education has been fluctuating between a curricular emphasis on problem solving and basic facts. Also problem solving cannot be a separate topic and its' study has to happen in

the context of learning mathematics. This arises the need for further research about problem solving in mathematics education.

3. Data, Model, Applications or Influences

The results from quantitative and qualitative studies presented in this special issue help understand some key actions and options concerning teaching practices at all grade levels and on teacher training.