

Project Abstract

Conceptual Model-based Problem Solving: A Response to Intervention Program in Mathematics Problem Solving (COMPS-RtI)

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About 5-10% of school age children are identified as having mathematics disabilities, putting them at significant risk of persistent academic, life, and work challenges. Funded by the National Science Foundation, the COMPS-RtI project was to develop a cross-platform mathematics tutoring program to nurture conceptual understanding of mathematics word problem solving of elementary students with learning disabilities/difficulties in mathematics (LDM).

Despite a proliferation of web-based mathematics games, there is a lack of programs or tools that focus on *conceptual understanding* of fundamental mathematical ideas—concepts that are essential in *enabling* students with LDM to catch up with their peers. The proposed computer-generated instructional program is designed to provide tutoring that is tailored to individual student's learning profile, with an emphasis on making explicit the reasoning behind the fundamental mathematics ideas. The tool's flexibility facilitates group or one-on-one instruction within the regular classroom settings, or other sessions during or after the school day. It addresses a significant practical issue in today's classrooms: lack of qualified teachers to deliver individualized effective intervention to those students who are struggling in their regular classrooms. The objectives of this COMPS-RtI project include: 1) Create the curriculum content, screen design, and teacher manual for four modules of the COMPS program in the area of additive word problem solving; 2) Design and develop the cross-platform computer application that can be ported as a web-based, iPad, Android, or Windows app.; and 3) Conduct field test studies to evaluate the impact of the program in enhancing students' word problem-solving performance.