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# Incorporating mathematical problem solving in the Chilean school curriculum

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*Problem solving is one of the skills that is expected to develop in children who learn mathematics. To do this, school mathematics curriculum worldwide has incorporated this skill for teachers to promote it in classrooms. Though research results show what should be made, these have been parceled and make difficult an effective incorporation of the skill, its promotion and students' learning in schools. Therefore, the following work presents a professional development strategy that incorporate diverse research results related to the promotion of problem solving in math class. This allows to achieve a professional development complex system whose main axis is the school teacher.*

*Keywords: Problem solving, math curriculum, professional development.*

## Introduction

In Chile, the General Law of Education states that “*students develop knowledge, skills and attitudes that allow them to understand and use basic mathematical concepts and procedures, related to numbers and geometric forms, in everyday problems solving, and to value the contribution of mathematics to understand and act in the world*”, (article 29, section f). However, in the Curricular Study Programs of Chilean Mathematical Education there is no concrete proposal for teachers to promote such skills and attitudes in the classroom. Then, this poster shows one way to develop and include the problem solving in the Chilean Curriculum National of Math Education. To do this, is necessary to know what is needed for a successful curricular proposal implementation in math. The NCTM (2014) suggests the following points to implement a successful curricular development proposal: a) Teachers need to have a professional development of high quality to maximize the efficacy of the materials and activities they propose in the curriculum, since even the best textbooks and resources can be misinterpreted or misused. b) Collaboration among teachers throughout the school year may result in appropriate adjustments and activities adaptations for dosing topics to address the strengths and weaknesses of each student. For this reason, along with thinking about the curricular development proposal, a professional development proposal that supports teachers to incorporate in a better form the new requirements that are demanded need to be thought. On the other hand, Marrongelle, Sztajn and Smith (2013) indicate that the characteristics that make more effective a professional development program are: to be performed regularly and connected to practice; to be focused on students learning; to be directed to the teaching of a content; to be aligned with objectives of the school; and to build strong links among teachers. Considering the perspective mentioned above, in the following parts will be described the process for the implementation and the incorporation the PS in the curriculum.

## Methodology

The project aims to impact the: instructional practices of participant teachers related to the delivery of opportunities to develop skills in the students, focused in problem solving; teachers' skills to solve problems; teachers' skills to modify and adjust activities to promote the development of skills in their students; students' skills to solve problems; students' skills to represent, report, discuss, argue and explain mathematically. For this purpose, a proposal for curricular development that was adapted to the reality of the Chilean school system in Mathematics Education was designed. The project includes two main stages. In the first one a proposal for curricular development based on a literature review was designed, based on the Chilean curricular framework. The proposal included classroom activities for students, instructional methodologies for teachers and an annual curriculum integration plan for each participating school. In the second one, there was implemented a pedagogical technical support model in order to teachers appropriate the activities and methodology to be performed later in the classroom. The curricular development proposal will be implemented in 4 schools, which compromised their participation of teachers and students from 1st to 4th grade and the time necessary to do so. It had a population of 24 teachers and 600 students from 1st to 4th grade in total.

## Discussion and conclusions

The project is still being conducted, but there are preliminary results on its implementation. In the stage 1 of the proposal design was observed that while the curricular proposals from countries such as Singapore or Finland have among their curricular objectives to promotion of mathematical skills as the problems solving, the curricular resources available for teachers in those countries do not guarantee by their own, the skill promotion and not the acquisition of teachers' instructional practices. Again, research results corroborate the lack of professional development strategies that allow the skills acquisition by teachers (Bunyi, 2013). Given this lack and the need of the Chilean teachers in terms of mathematical knowledge, as well as in pedagogical skills to promote mathematical skills and attitudes towards it in classrooms, it is that the strategy of weekly and monthly support was crucial, both for the acquisition of pedagogical skills and mathematical knowledge.

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