



# **"Thinking Positively" Math Program**

## **Executive Summary**

September 2014

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### **Program Description**

The Thinking Positively program aims to increase the number of students that choose to study Math at intensive level (5-units) in high school. The program identifies students with the potential to reach 5 units in Math, places them in study groups of eight under the instruction of university students and volunteers from high-tech companies. The learning in these groups is adapted to the abilities and inclinations of each student, allowing them to keep up and gain confidence in their Math abilities. In 2014 the program reached around 240 students who benefited from an additional four hours per week after school.

### **Purpose of the Study**

To examine the effectiveness of the program and the extent to which it produces outputs and desired results, and to provide formative information that could help improve the program's implementation and efficiency.

### **Methodology**

Four main tools were used in this study: student questionnaire, knowledge examination, teacher questionnaire and interviews with various stake-holders. Questionnaire was relayed to those students who participated in Math reinforcement classes, at three points of time: December 2013 (N=109), March 2014 (N=130) and July 2014 (N=82). The questionnaire, which was prepared following a broad literature review, examined variables related to educational achievements, motivation, independent capability in Math, opinion about Math in general and about Math at 5-units matriculation in particular. In addition, exam results were analyzed at the three points of time. Finally, 18 Math teachers responded to an online questionnaire at the end of the year, asking about their perceived contribution of the program.

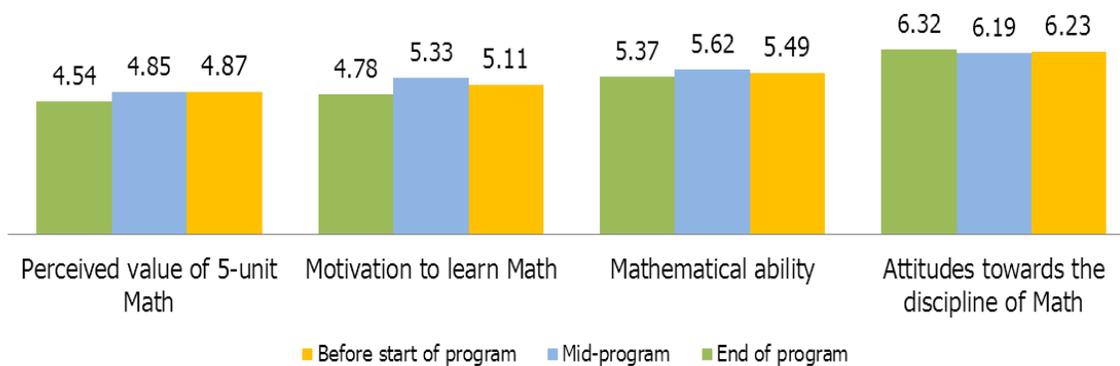
### **Main Findings**

- There was a noticeable improvement in the mathematical knowledge and skills of most students in the program, as reflected in exam results. At the end of the year, 71% of students reported that their educational achievements were among the best in their Math class; this compares to 52% at the start of the year. Similarly, the average score in the exam at the end of the year was 79 compared with 67 at the start of the year (in a matched sample among 166 students).

A further indication of improved achievements is found in the schools' internal exams, where the average end-of-year score was 79 compared to 73 at the beginning of the year.

- Nearly all the Math teachers (94%) said that the program contributed to improved mathematical ability of the students and to an improved chance to get into the 5-unit Math matriculation class. 80% of teachers thought the students will move on to 5 units in the coming year. 55% claimed that the students would not have been able to enter the 5-unit class if not for the program.
- There was a mixed outcome regarding changes in the students' attitudes and opinions about Math. In most parameters, there were no consistent improvements. A possible explanation is that most students accepted to the program believed in their own ability to succeed at Math; or that this reflects social desirability bias.

Changes in students' attitudes and opinions about Math and their own mathematical ability\*



\* On a scale of 1-7

- In the opinion of the students, the program's main contribution was in improving Math knowledge and increasing their chance of entering the 5-unit Math class (68% claimed that the program contributed in this way to a great or very great extent). The perceived contribution was lowest for encouraging them to learn an intensive-level science subject (50%).
- Students and teachers reported high satisfaction with the program. Students thought the instructors were professional and had the right knowledge. However, around one-quarter of students felt that participation in the program led to their being over-burdened.

**Conclusions and Recommendations**

The study shows that participation in the program contributes greatly to acquiring the skills and tools for getting into a 5-unit Math matriculation class, as well as to improving the students' academic achievements in Math. At the same time, it is recommended to improve cooperation and communication between the classroom teachers and the program's instructors. It is also recommend to increase the training given to the instructors in order to help them integrate important teaching principles into their work, such as sharing a personal story, aligning expectations, engaging in one-on-one work with the student, and more.