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מוגשת למועצה המדעית של  
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By  
Tzila Yarhi

מאת  
צילה ירחי

אמונות של מורים בתיכון לגבי הוראת תלמידים מתקשים במתמטיקה,  
התמודדויות של מורים וכלים להתמודדות: חקר מקרה  
High school teachers' beliefs about teaching low-achieving  
students in mathematics, teachers' coping, and tools for coping:  
A case study

Advisors:  
Prof. Abraham Arcavi  
Dr. Ronnie Karsenty

מנחים:  
פרופ' אברהם הרכבי  
ד"ר רוני קרסנטי

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## **Abstract**

High school mathematics is a challenge and even a barrier for many students, especially for those who are non-mathematically-oriented. Cognitive and affective characteristics of these students are not always taken into account, thus they are often prevented from both making sense of what they study and from developing a positive identity as mathematics learners. In such cases, students may perpetuate negative attitudes toward mathematics and are at risk of failing or dropping out from mathematics classes. As this study shows, teacher education programs in Israel do not sufficiently prepare prospective teachers for the task of teaching non-mathematically-oriented students, and as a result many teachers' capabilities to properly teach in low-track mathematics groups are limited. In addition, many of the teachers assigned to teach in these groups are novice teachers with little experience or out-of-field teachers.

This study focuses on the case study of Assaf, a high school mathematics teacher who chose to teach non-mathematically-oriented students, endeavoring to adjust his pedagogy to the characteristics of this student population. His pedagogical approach centralizes students' understanding and sense-making, while de-emphasizing the use of formulas and formal procedures. Assaf has nine years of teaching experience, and during this period he took part in a professional development (PD) course where the participating teachers watched and discussed videotaped lessons taken in low-track mathematics classes. For the purpose of this study, Assaf was interviewed twice, four years after the end of the course. The first interview evolved around his retrospect watching of a lesson he taught on the topic of Exponential Growth and Decay. In the second interview, he watched and commented on a peer-discussion that took place in the PD course around the same lesson. The study aims to shed light on the worldview of a teacher who chooses to employ a pedagogy of "teaching for understanding" in mathematics classes of struggling students.

The analysis reveals several characteristics of Assaf's beliefs regarding teaching mathematics to non-mathematically-oriented students, among them the importance of recruiting students' intuition and common-sense for understanding mathematical content, and linking concepts to everyday realities whenever possible; the need to be cognizant and selective when using formal tools; the significance of adjusting and attuning challenges to students' knowledge and abilities; and the essentialness of supporting students' mental and emotional well-being.

The findings uncover the complexities faced by a reflective teacher, and unpack the kind of resources available to him when he attempts to cope with various conflicts while staying faithful to his worldview. On the basis of the study's findings, implications for the preparation and support of teachers in low-track mathematics classes are proposed.