



From High-Tech to Teaching: The Integration of a New Generation of Mathematics and Science Teachers in Israel's High Schools

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Among the reasons for the 2006-2012 decline in the number of five-unit graduates of mathematics and the sciences in Israel, was a growing shortage of teachers. For more than a decade, Israel relied for the most part on teachers who immigrated to the country from the FSU, however these teachers naturally retired. Based on finding from previous research work of *Zemah, Pass and Lapid* (2012), the Trump Foundation, the Ministry of Education and their partners in higher education, began to train a new cadre of teachers. The research identified high-tech employees at the ages of 35-45 as suitable candidates, and more than 15 training programs were created to select, train and coach them in schools.

After a few years of such work and as the flow of new talent into teaching has been steadily increasing, the foundation sought to examine how the new teachers are being assimilated into their new profession. They asked to understand the absorption process in schools and explore the professional, organizational and psychological barriers, and to identify potential levers for improvement. For the purpose of this research 13 school principals and mathematics department heads were interviewed, as well as 26 graduates of the Teacher Residency Programs and 5 graduates of the Teach First Israel program.

Findings and Conclusions

The encounters between the retrained mathematics teachers who participated in this study and the schools in which they were placed are highly varied. From the retrainees' side, there are more than a few stories of unsuccessful absorption forcing the new teacher to leave the school (in most cases for another school). There are also very positive stories, though fewer in number, of successful and satisfying absorption, and senses of enjoying and belonging in their new workplace, reinforcing their confidence in their decision to move into teaching.

For most new teachers, the success of absorption appears to be the product of a direct encounter between their own needs and the expectations of the absorbing school. The high-tech world from which most of them hailed is totally different to the typical school system in terms of its organizational culture, treatment of employees, working procedures and remuneration. For the most

part, the high-tech world is perceived as more highly developed, richer in resources, and more prestigious.

Most new-teachers chose to pursue educational careers due a sense of exhaustion of their profession in their lives to date, combined with a need for a new purpose in life. They believe that teaching offers the potential for self-realization and embodies a social and value-based mission. This conviction is reinforced by the reduction in salary that awaits them in their new field. In some cases, teaching mathematics at a high level is their ultimate aspiration, while others hope to reach positions of management and influence in the school and in the education system.

A minority have experienced failure or burnout in their previous profession, or desire a more comfortable and less demanding framework for their remaining years of employment until retirement.

Although they were trained in Teacher Residency Programs, which was supposed to be very rich in practice-based training, most of them still argue that the preparation they underwent was with too much theory and too little practice. This is particularly true in terms of the capacity of the training to prepare them for what awaits them in school and to provide an opportunity to experience difficulties that are as similar as possible to those in the field.

They point to lack of information on how to act in their new school. This includes such aspects as bureaucratic procedures for receiving salaries, instructional coaching in preparing lesson plans and the dynamic management of the class from the first encounter with the students through to shaping their approach to teaching. Class management is perceived as the hardest and most problematic challenge and they feel a sense of loneliness, and a need for support, guidance, and encouragement. These should be provided through hands-on guidance and supervision, though they are not always found in the absorbing schools.

In particular the new teachers have a need to observe them as they teach in the classroom and to be offered corrective and constructive feedback. They also expect to receive attention and direction from the senior staff at the school, and in particular from the principal and the department head. They expect that these functions will take into consideration their desires regarding the positions they will or will not fill in the school and will create a sympathetic environment for them among the teaching staff as a whole, and among the mathematics teachers in particular.

They are particularly anxious regarding their first encounters with the students. They see this as a kind of “baptism by fire” – an experience they have had very little real practice with, and a true, frightening, and potentially crucial test of their new vocation. The reason for this is that they perceive the students as fundamentally undisciplined. Even in schools that are considered relatively sympathetic toward the new teachers, they feel that the school does not fully keep the students under control. They expect the school to do its best to make their first steps easier, including necessary support with students and parents.

Only a minority of schools treated them beyond a solution to a specific shortage of mathematics teachers. These schools believe that they have an obligation to assist the absorption of the new teachers, to encourage them to grow and develop in the school.

A larger number of schools claimed that they were wishing to do so, but had no internal resources to support them. Therefore the schools expect the new teachers to manage by themselves and to acknowledge the constraints the school is facing.

Some schools argue that the new teachers should be thankful for the opportunity they have been given and that they should do the work without arguments and complaints. They must learn how to survive and operate in the hectic and pressured organizational world of the school, and allow the school to use them as an available and convenient resource according to the school's needs and its exclusive discretion.

The handful of schools that have clear and orderly policies and systems for absorption of new teachers share similar characteristics. They maintain a positive atmosphere and are sensitive to their needs. They use observations and instructional coaching from veteran to new teachers, that is specific to the content area they teach. The veteran teachers who are assigned to the coaching job are motivated and the department head and the school principal are involved. However, in most schools this is not the case and no consideration is shown regarding the difficult first encounter between the new teachers and the students.

In many cases, the new teachers face pressure to accept upon themselves additional responsibilities quickly, particularly as homeroom teachers, even when they are not interested in such tasks – at least in this initial stage. In some cases this pressure takes the form of a suggestion, in others it is a demand.

The typical relationship that emerges against the background of these gaps usually leads to diametrically opposed opinions on the question as to which side is supposed to adapt itself to the other's needs and expectations, and to what extent. The power relations reflect a double-edged imbalance. The new teachers arrive in the stronger position in terms of the status and prestige they enjoy from their former positions and of the world from which they come, but weaker in terms of their status as beginners in a new and alien system.

The relevant functions in the school, with the authority and power available to them, represent a more backward, deprived, and weak system than the one from which they came. This double imbalance influences and is influenced by the actual interaction between the two sides. In most cases, it is translated into relatively forceful behavior on the part of the school, with the goal of dictating to the new teacher a form of absorption based on the school's needs, while obscuring or eliminating their perceived status, prestige, and managerial experience in their former positions.

The relative rare exceptions to this pattern, resulting in successful absorption stories, are found when self-confident schools seek to build themselves with the

help of the new high-quality staff, and translate this into a particularly well-developed absorption system. Similarly, other success stories include particularly strong teachers, who arrive at the school with a strong self-image, are able to convince the school to accept them on their own terms from the outset, or teachers who overcome the initial difficulties and quasi-alienation of the school in terms of their needs and are nevertheless absorbed in their new workforce.

Accordingly, the typical new teacher can be described as a “new immigrant” who has moved from a wealthier country and class to a promised land that is less developed. The newcomers expect to receive a generous “relocation package” that will help them settle and prosper for their own sake and that of their new home, but in reality find themselves in the position of immigrants who arrive in the new land and are forced to bear the full burden survival. Their former achievements are almost completely irrelevant now. The result is that even if the newcomers do not ultimately abandon their new home and return to their homeland, they usually become much less involved citizens and much less satisfied and productive.

On a happier note, this study included an examination on a limited scope of the Teach First Israel program. It emerged that this specific program offers a model that could be used to identify ideas for the systemic and full structuring of the absorption process for new teachers in schools. This includes creating a clear contract between all those involved in absorbing the new teachers and ensuring the presence of procedures and means that meet their key needs during the absorption phase.

We recommend that this aspect be examined on a broader and more systemic basis than was the case in the present study.