The Rothschild-Weizmann Program for Excellence in Science Teaching

A Ten-year Perspective

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The Science Teaching Department Celebrates 50 Years of Activity, 7.1.2019
Three partners carried out the program:

- Philanthropy: The Rothschild Caesarea Foundation
- Academy: Weizmann Institute of Science Department of Sciences Education
- Educational System: Ministry of Education
The Goal
To develop a cadre of lead-teachers who would promote mathematics and science education in Israel

The Program

• 2 tracks for Acting High School Teachers in mathematics, biology, chemistry, physics.
  • A 2-year MSc program - without thesis (253 graduates, 70% women, 20% from the non-Hebrew sector)
  • A track for excellent teachers with MSc or PhD degrees - initiatives and special projects (150 teachers)

• Emphasis on disciplinary scientific knowledge and pedagogical content knowledge

• On-going research and evaluation on the operation and outcomes of the program (e.g. teachers’ and students’ learning)

400 RW Ambassadors in 10 years
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<tr>
<th>Discipline</th>
<th>Scientific Head</th>
<th>Science Education Head</th>
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<tr>
<td>Biology</td>
<td>Prof. Adi Kimchi</td>
<td>Prof. Anat Yarden</td>
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<td>Chemistry</td>
<td>Prof. Ron Naaman</td>
<td>Prof. Avi Hofstein</td>
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<td>Prof. Gilad Haran</td>
<td>Dr. Rachel Mamlok-Naaman</td>
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<td>Physics</td>
<td>Prof. Shimon Levit</td>
<td>Prof. Bat Sheva Eylon</td>
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<td>Mathematics</td>
<td>Prof. Zvi Artstein</td>
<td>Prof. Ruhama Even</td>
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<td>Prof. Sergei Yakovenko</td>
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The three partners had different backgrounds, views, interests and norms leading to possible dilemmas.

Possible Dilemmas

- Knowledge and curriculum needed for excellence in teaching
- From the academic studies to teachers’ practice
- Program’s requirements versus teachers’ professional commitments
- Criteria for program’s “success”
Scientists and science educators defined together a unique set of goals, rationale and curriculum for each discipline.
An evidence based approach: Students systematically explored new experiences and brought data on teaching and learning for collaborative and reflective discussions with their peers.
Two complementary tracks: Graduates of the MSc program continued their professional development and implemented innovations in the second track.
A steering committee (headed by Prof. Israel Bar-Joseph) – scientists, science educators, representatives from the graduate school and the foundation discussed different aspects of the program.
How people from different backgrounds learn to work productively with each other?


Boundary crossing perspective*
Such dilemmas exist in many partnerships of academy and practice (we call them Research Practice Partnerships).

The question is:

**How people from different backgrounds learn to work productively with each other?**

- Extensive studies of such partnerships, and in particular "successful" ones, identified the need to "cross boundaries" between partners. These studies led to the formulation of the "multilevel boundary crossing" perspective.

- We found that this perspective resonates with many of the experiences and research findings in our program.
1. **IDENTIFICATION:**
Recognizing others' points of view

2. **COORDINATION:**
Looking for ways to cooperate with others

3. **REFLECTION:**
Taking the others’ perspective into account

4. **TRANSFORMATION:**
Transforming one's point of view.
## Multilevel Boundary Crossing

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<th>Institutional</th>
<th>Interpersonal</th>
<th>Intrapersonal</th>
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<td>IDENTIFICATION</td>
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<td>REFLECTION</td>
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<td>TRANSFORMATION</td>
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(Akkerman and Bruining, 2016)
Conclusion

1. The mechanisms which acted along the 10-year operation
   - Trust and Productive interactions
   - Smooth running and on-going improvement

2. Some results from research
   - Teachers: Professional development and change of teaching practice
   - School students reported on profound changes in teaching and learning
   - System: The graduates contributed to the system (e.g. as lead-teachers, curriculum developers)

3. The theoretical framework
   - Insights into strategies that can be used in similar partnerships (Coburn and Penuel, 2016)

4. Open issues
   - sustainability of the program’s outcomes
   - keeping the spirit, vision and relevance of the program in light of changes
   - Attracting high quality teachers in light of less demanding frameworks
and I'm talking hundreds of teachers.

and see his desire to reach us, the teachers.
In recognition of the program's value, the WIS decided to continue the program via the Feinberg Graduate School.

This is an opportunity to thank the Caesarea Edmond-de Rothschild foundation for their friendship, support and trust.
Thank you!
The image shows a group of students that graduated and participated in the Rothschild-Weizmann Program for Excellence in Science Teaching MSc conferment ceremony.