

המחלקה להוראת המדעים



קרן קיסריה
אדמונד בנימין דה רוטשילד

The Rothschild-Weizmann Program for Excellence in Science Teaching

A Ten-year Perspective

Bat-Sheva Eylon

Miriam Carmeli

The Science Teaching Department Celebrates 50 Years of Activity, 7.1.2019

Three partners carried out the program



המחלקה להוראת המדעים

ACADEMY



קרן קיסריה
אדמונד בנימין דה רוטשילד

PHILANTROPY

THE RW PROGRAM



משרד החינוך

EDUCATIONAL SYSTEM

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

Discipline	Scientific Head	Science Education Head
Biology	Prof. Adi Kimchi	Prof. Anat Yarden
Chemistry	Prof. Ron Naaman Prof. Gilad Haran	Prof. Avi Hofstein Dr. Rachel Mamlok-Naaman
Physics	Prof. Shimon Levit	Prof. Bat Sheva Eylon
Mathematics	Prof. Zvi Artstein Prof. Sergei Yakovenko	Prof. Ruhama Even



Possible Dilemmas

The three partners had different backgrounds, views, interests and norms leading to 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"**

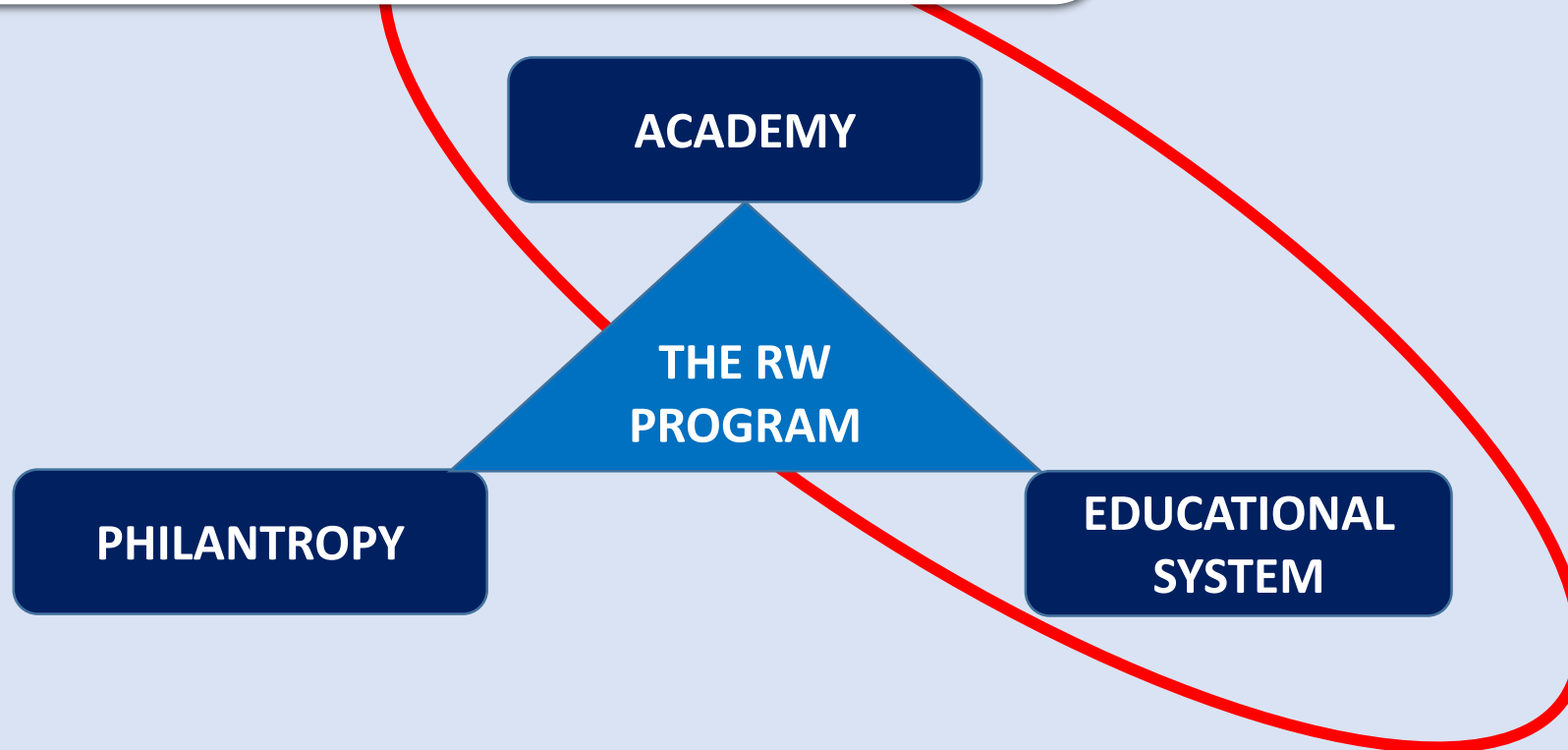
Mechanisms

Scientists and science educators defined **together** a unique set of goals, rationale and curriculum for each discipline.



Mechanisms

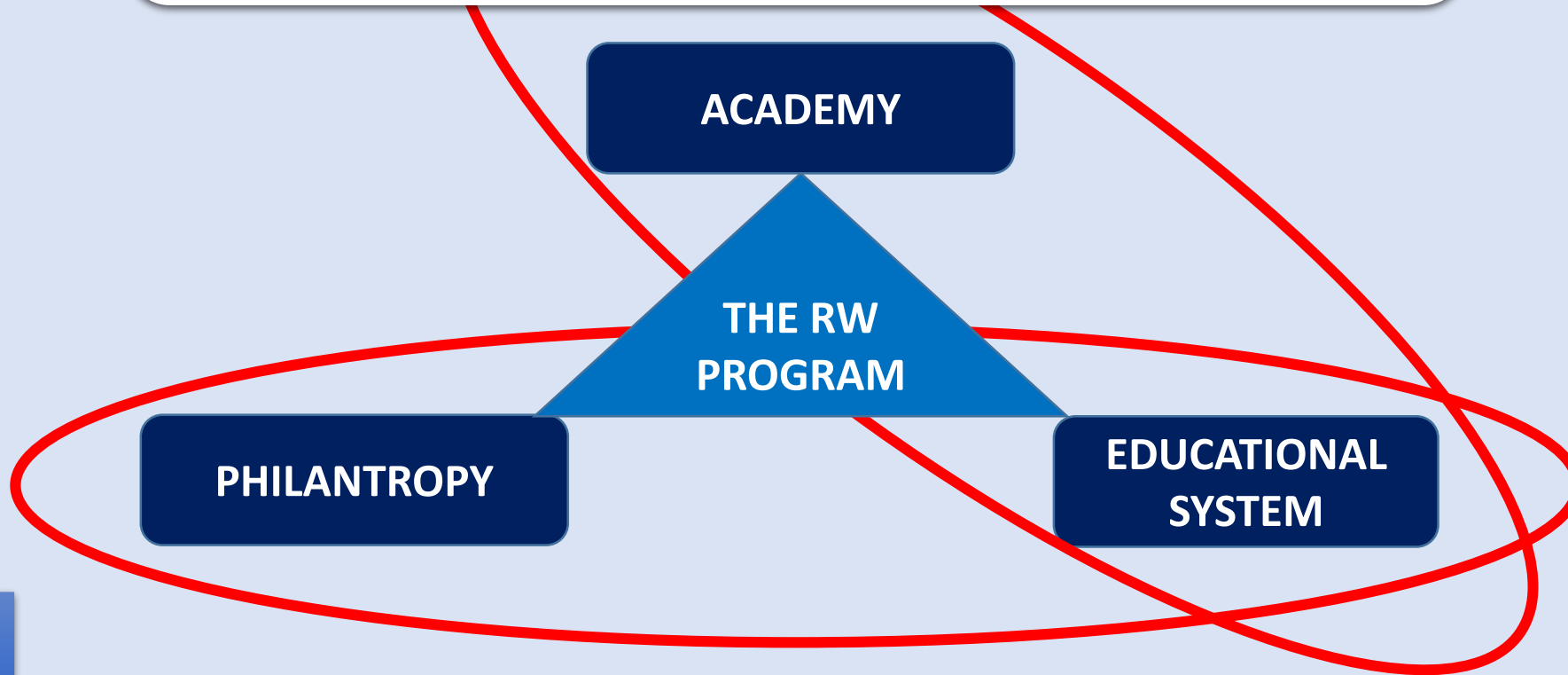
An evidence based approach: Students systematically explored new experiences and brought data on teaching and learning for collaborative and reflective discussions with their peers.



(Hutchings and Shulman, 1999)

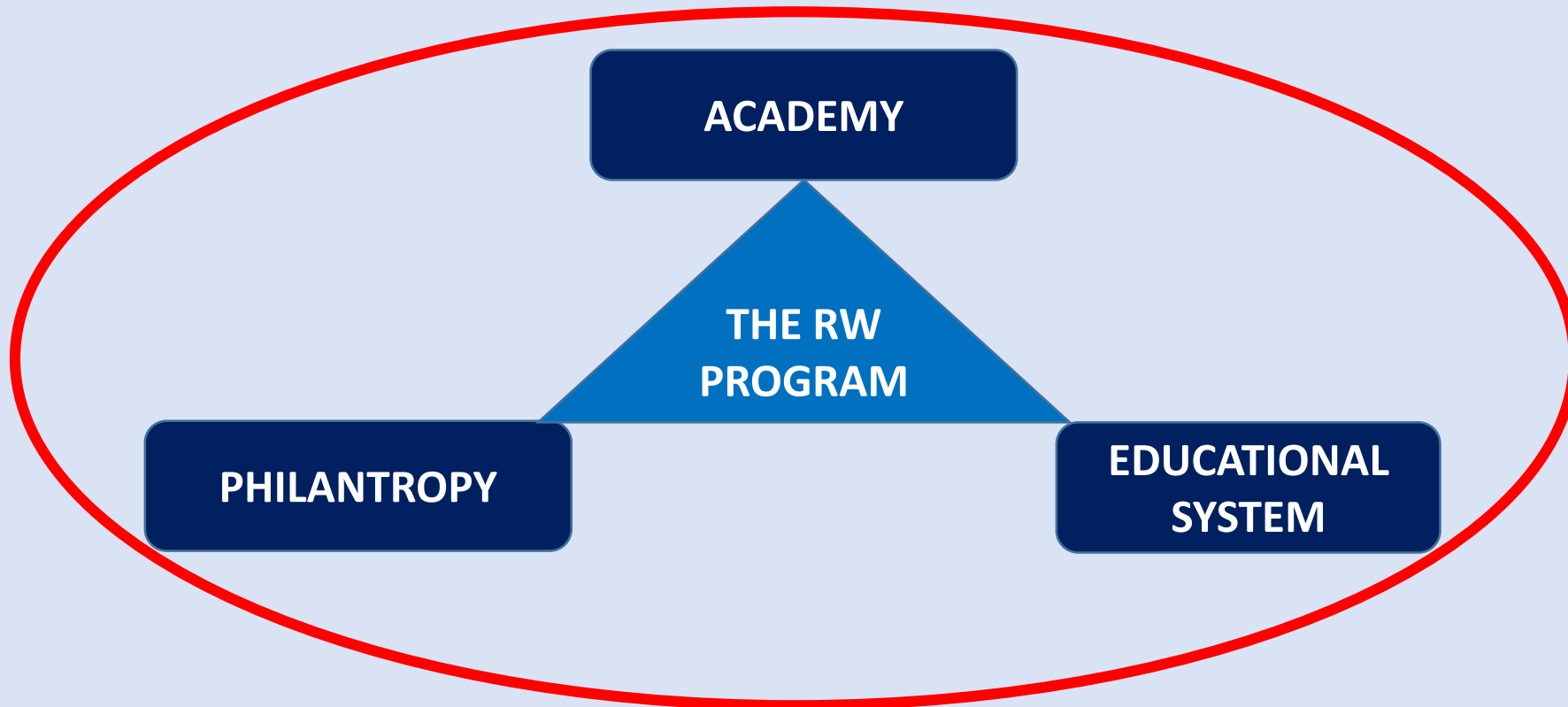
Mechanisms

Two complementary tracks: Graduates of the MSc program continued their professional development and implemented innovations in the second track



Mechanisms

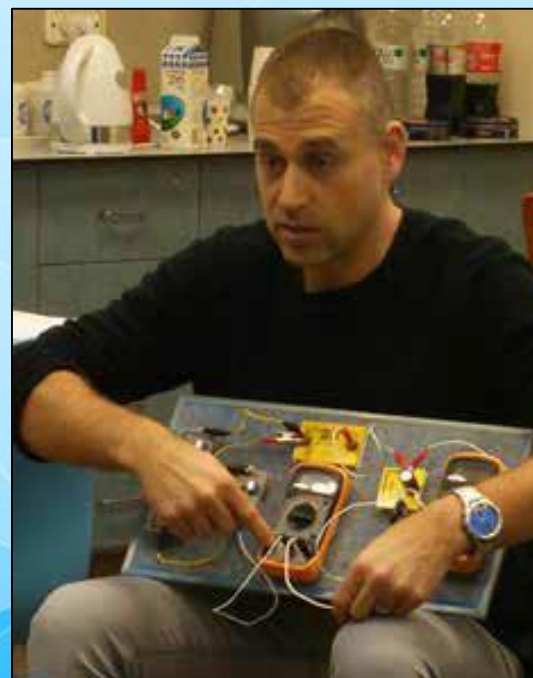
A steering committee (headed by Prof. Israel Bar-Joseph) –scientists, science educators, representatives from the graduate school and the foundation discussed different aspects of the program



Boundary crossing perspective*

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

*(Penuel, Allen, Coburn, & Farrell, 2015), (Akkerman & Bakker, 2011)



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

The question is:

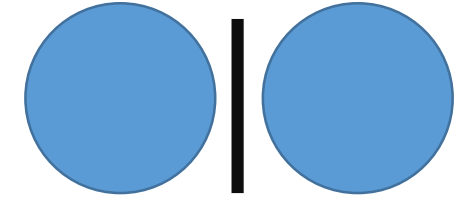
How people from different backgrounds learn to work productively with each other?

- 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.

Boundary Crossing Processes

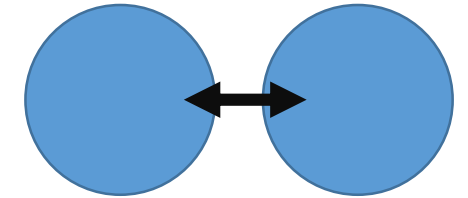
1. IDENTIFICATION:

Recognizing others' points of view



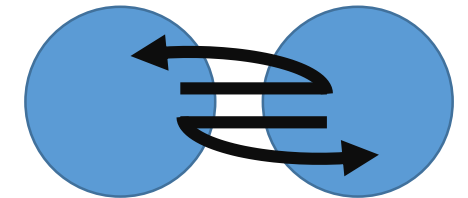
2. COORDINATION:

Looking for ways to cooperate with others



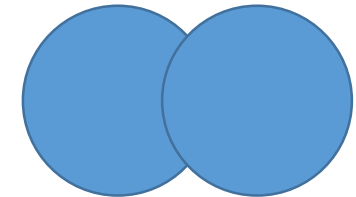
3. REFLECTION:

Taking the others' perspective into account



4. TRANSFORMATION:

Transforming one's point of view.

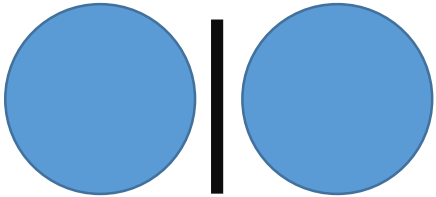


Multilevel Boundary Crossing

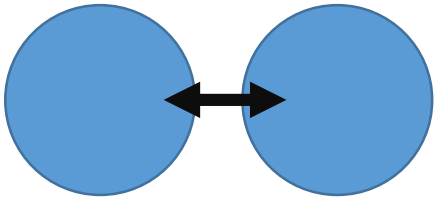
Institutional

Interpersonal

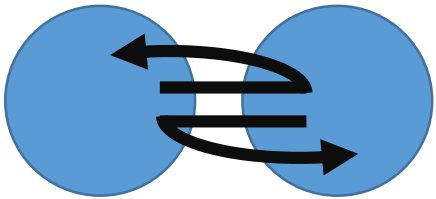
Intrapersonal



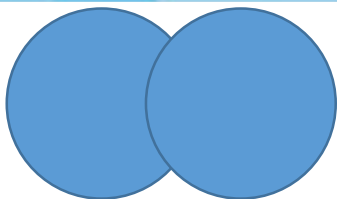
IDENTIFICATION



COORDINATION



REFLECTION



TRANSFORMATION

(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

FINALE



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!



טקס הענקת תארי מוסמך
לבוגרי תכנית רוטשילד-ויצמן
למצוינות בהוראת המדעים
2013

Rothschild-Weizmann Program
for Excellence
in Science Teaching
MSc conferment ceremony


מכון ויצמן למדע
WEIZMANN INSTITUTE OF SCIENCE

