February 2, 2017[[1]](#footnote-1)

 **Institute for Advanced Teaching[[2]](#footnote-2) in Mathematics and Science**

**Vision**

Every student realizes their academic potential with the help of excellent teachers and quality teaching based on clinical tools and methods.

New teachers are supervised by an experienced teacher; teachers are members of professional communities in their fields of knowledge inside and outside the school. The classroom doors are open; teachers consult with each other and provide mentorship and feedback in order to improve teaching and learning.

Mathematics and science teaching in Israel is based on a leading cadre of excellent teachers who play an active role in their peers’ professional development processes, using research-based tools and practices that promote their students’ learning.

**The Current Situation: Deficiencies and Opportunities**

Some 17,300 mathematics and science teachers teach in post-elementary education (junior-high and senior-high). Over 20 percent of them play an active role in the professional development processes of other teachers. Some do so in official capacities such as subject coordinator or instructor, while others do so in informal frameworks, such as facilitating in a professional community inside the school or elsewhere, or as pedagogic supervisors in various frameworks. These teachers define and build professionalism in teaching.

**Pie chart labels**

Biology

Chemistry

Science

Mathematics

Physics

**20% leading teachers**: Subject coordinators, instructors, community facilitators, and pedagogic supervisors

**2-4% senior teachers** who teach the leading teachers.

**Total: 17,259 mathematics and science teachers in post-elementary education (junior-high and senior-high)**

The pedagogic leadership and supervision positions (official and unofficial) do not have any job definitions or professional standards, and there is no resource center pooling practical knowledge and research-based tools and making these available to teachers. Accordingly, there is no training or accreditation for these positions, no in-service professional supervision, and no mapping, collection, and pooling of practical knowledge, most of which is lost.

In recent years, a concerted effort has been made to strengthen excellence in science education in Israel.[[3]](#footnote-3) Thanks to government policies and resources, teachers’ professional capabilities, and the tools developed by research institutions and other bodies, positive momentum has been created and there has been a clear improvement in achievements.

What is needed now is to reinforce and consolidate the joint effort; coordinate and connect its various components and arms; inculcate the effort as a structured part of the system; and ensure that it rests on firm foundations. Teachers who provide pedagogic leadership and guidance for their peers should enjoy proper conditions enabling them to assume responsibility and to build the profession together and from the inside. The integration and balancing of these efforts with research, development, and policy will consolidate and deepen science education in Israel, enabling it to reach new peaks.

**The Establishment of the National Institute for Advanced Teaching in Mathematics and Science**

The Institute for Advanced Teaching will provide a response for the twenty percent of mathematics and science teachers who, in addition to classroom teaching, play an active role in their peers’ professional development processes.

For these teachers, the Institute for Advanced Teaching will function as:

**A center of expertise and practical knowledge**: Mapping, collecting, and developing tools, methods, and skills that support adapted learning and promote students’ learning. Adjustments will be made for the different leadership and pedagogic supervision functions.

**Policy implementation arm**: For example: formulating job definitions for leading teachers (coordinator, instructor, leader of a community outside the school, etc.); developing professional standards for each position; planning the training, accreditation, and in-service professional supervision procedures; selecting, supervising, and budgeting training programs for the different positions and specialization courses in tools/methods.

**Professional school for leading teachers**: Activating the Master Teacher program, conferences and seminars, and a professional network.

**What will the Institute for Advanced Teaching not do?**

* Development of curricula, textbooks, etc.
* Research in science teaching
* Implementation of training programs and supervision for the various pedagogic leadership functions (coordinator, community facilitator, etc.) – but it will develop standards and function as a center for expertise and professional backup.
* Professional home for teachers from the different subjects (this is the function of the National Teachers Centers).

**Description of the Establishment Process**

The Ministry of Education, the Weizmann Institute, and the Trump Foundation have reached in-principle agreement that the Institute for Advanced Teaching in Mathematics and Science will begin to operate in the 2017-2018 school year. The Institute will be established as a national (inter-institutional) body – led by the Ministry of Education, under the auspices of the Weizmann Institute, and in cooperation with the Trump Foundation.

An establishment team is currently being formed for the Advanced Teaching Institute, as well as sub-teams (teachers, academia-field connection, etc.). These teams are working to translate the vision into reality and to create the conditions that will enable the Institute to work. This will ensure that mathematics and science teaching in Israel will be based on a leading cadre of excellent teachers who play an active part in their peers’ professional development processes, using research-based tools and practices that promote their students’ learning.

(Some of the) open questions underlying the establishment process:

* What are the Institute’s objectives, key milestones, principal deliverables, and criteria for success?
* What will be the Institute’s MO in terms of governance structure and budgetary framework (short and long term)?
* What will the relationship be between the Institute and academic institutions and relevant educational bodies in the field, including the relationship with the various educational organizations at the Weizmann Institute (in other words – what will the modalities be for mutual learning and the effective “consumption” by the field of academic research knowledge – and vice versa)?

Regarding the functions of the Institute for Advanced Teaching:

* Expertise center: what tools and methods should the Institute use to collect expertise from the field, and which should it develop in order to help/advance/be relevant for teachers and pedagogic leaders in their various functions? How should the knowledge be made accessible in order to ensure that it is used?
* The implementation arm: defining the relationships with the Teachers Centers; the Regional Pedagogic Center; the Mathematics and Science Division; the Teaching Workers Training Division, etc.
1. This document is being updated and consolidated thanks to the opinions, comments, and suggestions of many partners. We are grateful for any reactions: teisenmann@trump.org.il [↑](#footnote-ref-1)
2. Advanced teaching: 1) Teaching that includes clinical skills and practices; 2) teaching that extends beyond the confines of the classroom and assumes responsibility and partnership in the professional development processes of teachers. [↑](#footnote-ref-2)
3. Details of action in different fields over recent years:

 Teachers. Professional communities were established in which teachers open the classroom door, consult with the peers, and provide mentorship and feedback. What is needed now is to develop the elite layer of leading teachers (instructors, coordinators, community leaders, mentors, and supervisors), create advanced professional career tracks, consolidate clinical teaching skills, and formalize professional standards.

 Research and development. Tools and methods have been developed enabling teachers to focus teaching on students’ learning, such as: diagnostic tasks and video simulations. The need now is to create a practical connection between these components, forge cooperation between the development institutions, and create systemic experimentation, documentation, feedback, and sharing in order to draw development closer to the professional field.

 Government policy. The national program has created focus in the entire system, defined goals and criteria, and allocated resources. Simultaneously, the focus of gravity of professional development for teachers has shifted to practical knowledge. Now the time has come to regulate and budget these learning processes for teachers on a permanent basis, including the ring-fencing of the necessary resources to this end. [↑](#footnote-ref-3)