



How Teachers Can Learn From Video-Recorded Lessons

– Executive Summary –

Coordinated and Edited by: Sergei Talanker

Activity Report



The Initiative for Applied Education Research
The Israel Academy of Sciences and Humanities

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Jerusalem, 2013

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The Israel Academy of Sciences and Humanities was founded in 1959. Its membership currently comprises close to 100 top Israeli scientists and scholars. The Israel Academy of Sciences and Humanities Law, 1961, declares that its principal objectives and tasks are to foster and promote scientific activity; to advise the Government on research activities and scientific planning of national importance; to maintain ties with foreign academies of science; to represent Israeli science at international institutes and conferences; and, to publish articles that can further science.

The Initiative for Applied Education Research (the Initiative) places up-to-date, scientific, critically-appraised knowledge and information at the disposal of decision-makers in the field of education. This kind of information is crucial for the intelligent formulation of policy and for optimal planning of interventions to improve educational achievements in Israel.

The Initiative's vision: Research knowledge is an essential component for planning public policy or comprehensive interventions. In the planning phase, critically-appraised research knowledge supports the formulation of policy whose chance of success is greater, and at a later point, enables rational public discourse to take place. The Initiative implements this vision in the field of education.

The Initiative's method of operation: The issues the Initiative addresses are those raised by decision-makers and it consults with senior Ministry of Education officials and other stakeholders. The Initiative's steering committee, appointed by the president of the Israel Academy, is responsible for the Initiative's work program and the peer-review processes of documents it creates.

The Initiative operates by means of expert committees and by convening joint symposia for researchers, professionals in the field and decision-makers. It publishes a variety of reports and makes them available to the public. Members of expert committees carry out their work on a voluntary basis.

History of the Initiative: The Initiative was established in late 2003 as a joint venture of the Israel Academy of Sciences and Humanities, the Ministry of Education, and the Rothschild Foundation (Yad Hanadiv). Since the beginning of 2010, the Initiative has been operating as a unit of the Israel Academy. In the summer of 2010, the Israeli Knesset amended the Israel Academy of Sciences and Humanities Law, regulating the Israel Academy's advisory role vis-a-vis government ministries seeking its consulting services. The Initiative directs the consulting activities on education related issues which the Israel Academy provides to the government and various authorities.

The Trump Foundation was founded in 2011 and in the coming decade, plans to dedicate its resources to improving education in Israel. The foundation is interested in promoting quality teaching which focuses on the abilities, needs and academic advancement of every student. The foundation aims to contribute to restoring Israeli education to its rightful place on the list of national, social and familial priorities.



The foundation concentrates on promoting quality teaching of science and mathematics subjects in secondary schools. In its activities, the foundation strives to change the downhill trend in these fields, a trend evident in, among other things, the decrease in the number of

schools maintaining physics majors, the reduction in the number of students studying math at the five-unit level, and in the growing shortage of teachers of these subjects.

The foundation believes that every student is entitled to benefit from excellent teaching and is convinced that there are many students in Israel capable of succeeding in their studies. The foundation's activity relies on talented teachers who believe in their students' abilities and, together with them, set ambitious goals and do all they can in order to advance them. The foundation is guided by the conviction that fostering such teaching, investing in its development and supporting its growth and success, is critical.

As such, the Trump Foundation operates three strategic programs to cultivate outstanding teaching - programs that focus on promoting student learning. The first centers on harnessing excellence to teaching, the second on fostering teachers' clinical skills and expertise, and the third on creating a support network for the demonstration of quality teaching.

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This report underwent the customary independent peer review process. The report editor is grateful for the review which helped ensure its clarity, quality and non-dependence. The editor takes full responsibility for its contents.

Sergei Talanker, Activity Coordinator

¹ The names listed here appear in alphabetical order.

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² The Table of Contents reflects the content of the entire original Hebrew-language report.

Abstract

Learning from experience is an important component in the work of professionals: Learning from one's own accumulated experience, learning from the experience of colleagues and learning from accepted archetypes of ideal professional. Each one of these types of learning requires abilities and language which can be cultivated. These are needed particularly in multi-faceted and non-routine occupations. Teaching is this type of occupation. There is much evidence indicating that the quality of teaching is a decisive variable affecting student success (on standardized tests, tests examining depth of comprehension and those that measure emotional resilience and satisfaction). Hence, the public and professional interest in options for improving the quality of teaching.

The use of video-recorded lessons in research, training and professional development is not new and has developed greatly in recent years following efforts invested in understanding teaching, in teachers' knowledge, in classroom dynamics in different content areas, etc. The technological developments that have transformed video and storage – making its development and accessibility relatively simple – have paved the way for a new era in the use of video-recorded lessons as a means for teachers' professional development. Research in recent years points to the possibility of effectively using video-recorded lessons as an opportunity to improve teachers' professional learning, but also to its limitations and even its risks.

The Trump Foundation has been operating for the past two years to improve educational achievement in Israel. Together with others, the Foundation is contributing to restoring education in Israel to its rightful place on the national, social and familial agenda, and focuses on promoting the quality of teaching in mathematics and sciences in secondary schools. The Foundation turned to the Initiative for Applied Education Research, a unit of the Israel Academy of Sciences and Humanities, with a request that the **Initiative** set in motion a study process whose focus is "how these new technologies can be used to help teachers to do their best in the profession they have chosen." The **Initiative** responded affirmatively to the request and arranged a series of study meetings on the topic for a group of approximately 30 researchers, professionals and decision-makers – all experts and experienced professionals and stakeholders in the field.

The study activity was led by a steering committee which included Prof. Bat-Sheva Eylon of the Weizmann Institute of Science (chair), Dr. Adam Lefstein of Ben-Gurion University, and Dr. Atara Shriki of Oranim College. Two experts from the United States – Prof. Charlotte Danielson and Mr. Mark Atkinson – were invited to share their vast experience in the use of video-recorded lessons for teachers' professional development.

The series of study meetings presented knowledge and insights gained from research and experience, and issues of principle related to use of videoed lessons for teachers' professional development were discussed. The issues below, among others, were discussed:

- ◆ The tension between use of video-recorded lessons for purposes of teaching evaluation and for use in professional development

- ◆ The advantages and disadvantages in use of a "teaching framework" (pre-defined criteria, indicator or tool describing "good teaching") as a theoretical and practical framework for analyzing video-recorded teaching
- ◆ The place of the teacher's work outside the classroom (for example, conversations with students or social activity) and its absence from the analysis based on video-recorded lessons
- ◆ The ethics of video and protecting the video-recorded subjects' privacy
- ◆ The advantages and disadvantages of analysis based on the content being taught as opposed to analysis based on a "general picture of teaching"
- ◆ The role of the discussion moderator in a video-recorded lesson and his relation to the person running the professional development activity
- ◆ The possibility of a teacher him/herself learning from video-recorded lessons of him/herself and others
- ◆ The possibility that a video database can also offer teachers effective and imaginative examples by comparing instruction of a particular lesson in different contexts
- ◆ The quality and tone of the group discussion during analysis of video-recorded lessons and when learning from them
- ◆ The role of the lesson videographer and editor in preparing the video
- ◆ The option of using a centralized video database for various purposes (such as garnering the attention and involvement of students as opposed to focusing on teaching activity or explaining subject matter)
- ◆ Various images of teaching and learning and their influence on the use of video-recorded lessons for professional development: The experience and knowledge of the experts from abroad enriched the discussion especially with respect to the inputs from the massive Gates Foundation project on teachers and teaching and their association with student achievement (MET – Measures of Effective Teaching) and the sharing of their many years of experience in developing video-recorded materials from lessons in different subjects and from work via an indexed database and tools for its use by teachers and mentors as an opportunity for professional learning.

The report includes three sections and informative appendices:

The first section of the report describes the activity and contains a theoretical introduction and descriptions of the study meetings.

The second section presents the main questions and topics deliberated during the five days of study: Why record lessons? How teachers learn from video-recorded lessons? How can technological developments support teachers' professional development? Systemic aspects of effective, ongoing and systematic use of video-recorded lessons for this purpose.

The third section presents conclusions and the discussion "looking to the future," in which the following needs are presented:

- ◆ The need for policy and activities that will enable coordination between phases in which teacher learning within an observation system will take place. Such coordination will permit mutual learning and will represent an opening for a range of approaches. Ahead of the next school year, the Ministry of Education is planning to initiate a pilot project that will employ different approaches to integrating videos in teachers' study, and will be accompanied by an evaluation component. Attempts are likewise being made to begin such activity at the regional level and to train leading teachers who will eventually be integrated into the system using the fan method.
- ◆ Continuing and extending collaborations, which began within the framework of the present activity, between participants who share an interest in using videoed lessons, and expanding the circle of stakeholders
- ◆ Building a national video database and systematic examination of questions such as: Is there a need to build such a database? If so, what will its character be? Who will create it? Initial conversations on this topic were raised during the activity, though there is a need for more in-depth discussions.
- ◆ Examining different options for constructing or adapting ICT platforms suitable for use in Israel, and designed to enable learning from observation systems
- ◆ Continuing study and following technological developments in addition to the research and practice of groups involved in the field in Israel and around the world. The topic on which the group focused continues to advance at a rapid rate.

The appendices present the notes from the main lectures by study group members and guests from Israel and abroad. There are also notes from the panel discussions in which additional professionals participated; research summaries relevant to the topic are presented.

We hope that the fruit of this activity and this report will contribute to advancing the use of videos for teacher professional development in Israel.

1. Introduction

1.1 About the Activity

Use of video-recorded lessons for teachers' professional development holds enormous potential. The [Trump Foundation](#) is interested in the topic as a tool for improving teaching and learning. Research in recent years points to the possibility of effectively using video-recorded lessons to improve teaching, but also to its limitations and even its risks. The Trump Foundation turned to the Initiative for Applied Education Research which, together with researchers, professionals in the field and decision-makers, responded by creating a joint study process of the use of video-recorded lessons as a tool for professional development. The Trump Foundation and the Initiative for Applied Education Research (Initiative) first defined the structure of the process and its objectives. The activity's steering team included Prof. Bat-Sheva Eylon of the Weizmann Institute of Science (Chair), Dr. Adam Lefstein of Ben-Gurion University, and Dr. Atara Shriki of Oranim College. Dr. Sergei Talanker, the report editor, served as activity coordinator. The document summarizing the activity is the present report. The report format reflects the progress of the process to date and is not a final product. The public is invited to learn from the contents and theoretical materials discussed in the meetings and to promote the topic of improving teaching.

On a broader scale, the purpose of the activity was to improve mathematics and physics instruction through video-recorded lessons. In the words of Dr. Avital Darmon, executive director of the Initiative: "How these new technologies can be used to help teachers to do their best in the profession they have chosen." Research demonstrates that the quality of teaching is the leading factor influencing students' success in their studies. Research further shows that there are obvious characteristics of good teaching and a positive correlation exists between good teaching and student achievement, not only on standardized tests but also on tests that examine students' depth of understanding (see the MET report – [Measures of Effective Teaching](#)). During the course of the activity, methods were examined for improving teachers' instructional quality based on assessing attributes of their teaching by relying on video-recorded and other evidence.

Participating in the activity, which began in September 2012, was a study group comprised of approximately 30 people, all accomplished experts and stakeholders in the field – including Ministry of Education and RAMA (Hebrew acronym for the "National Authority for Measurement and Evaluation in Education") personnel, researchers, developers, teachers and teaching instructors.

From January through April 2013, the group met three times (for a total of five full days). Ahead of each meeting, the study group members received background materials that included information about the meeting and relevant theoretical material. In planning each meeting, topics raised in the previous meeting were taken into consideration, and in addition, a questionnaire was circulated and summarized, the answers to which served to help plan the details of the following meeting.

The first meeting in January 2013 was devoted to introducing the study group members to one another, to presenting positions on the activity's topics and to mutual learning. Study

group members presented work they had done in the field and on some of the activity's main theoretical topics.

The second meeting, which took place over three days during one week in February 2013, included a symposium open to the public on one day, and two days of workshops with a pair of researcher-developers from the United States: Prof. Charlotte Danielson, who developed a teacher assessment tool ([Framework for Teaching](#) – FFT), and Mr. Mark Atkinson, who created [Teachscape](#) – a system for recording lessons on video, editing and storing them in a manner enabling access for retrieval. The decision to invite these guests was made prior to the start of the activity in light of their participation in the MET project, which examined the relationship between teaching characteristics and student achievement in five different frameworks for teaching assessment, among them FFT. The meeting was planned taking into account the state of affairs in Israel concerning teacher learning from video-recorded lessons as well as the ideas raised in the first meeting. During the meeting, a number of main models for the professional development of teachers via video footage were characterized.

The final and concluding meeting in April 2013 addressed the systematic use of video footage for the professional development of teachers, according to the different models characterized in the second meeting. The meeting included four workshops for professional development according to the different models; likewise, discussions led by study group members compared the approaches to professional development. The meeting was planned in line with the focus recommended by the majority of group members.

1.2 Theoretical Introduction

In this section, we will briefly discuss several central issues relevant to teachers learning from video-recorded lessons. The intention is not to provide a theoretical and research review and neither is it to describe important projects in the field. The annotated bibliography in Appendix 4 summarizes several relevant articles. During the course of the activity, background materials were prepared which included selected reviews of articles and projects and references to sites. This material can be found in the "Background Materials" section on the Initiative's website.

The use of video to teach teachers started in the 1960s (Sherin, 2004). Many of the methods first used in this medium³ (see the summary of the article in Appendix 4) are still used today and are frequently adapted to theoretical and research developments with respect to teaching teachers. Many of these insights are based on theory and research on the teaching and learning of learners wherever they may be, with special adaptations for teaching adults (see, for example, the NRC's book – Quinn et al., 2011).

In the ten years since the Sherin review was written, much experience has been amassed in the use of video for teaching teachers. For example, Borko et al. (2011) describe different models for teaching teachers, models which integrate video-recorded lessons as a way of presenting the work of teaching. In the MET project, which will be discussed in greater

³ Micro-teaching, analysis of classroom interactions, expert teaching models, analysis of video-based events, hyper-media programs (structured multi-media), field observation

detail (see Appendix 4), much data was gathered which links teaching characteristics to student learning; videotaped lessons served as a main source of information about the work of teaching. This project, and the technological systems developed within its framework, made it possible to promote pedagogical discussion about teachers learning from videotaped lessons. The research findings, as well as the methodology used, provoked "stormy" discussions and, at times, disagreements between education researchers (see Section 2.2). The data gathered within the project framework are at researchers' disposal and will enable further research.

There is an overwhelming consensus in the professional literature regarding the importance of the teaching context for teacher learning. Video-recorded lessons are one of the effective tools for presenting the work of teaching and it can therefore provide learning opportunities for teachers (Borko, 2004; Ball & Cohen, 1999).

For teachers to learn, however, not only their own teaching can be studied. Video lessons of other teachers can stimulate many learning opportunities for teachers. Indeed, the different frameworks described in the literature on teachers learning from videos do not necessarily concern the teacher's own lessons (see Appendix 4: Sherin, 2004; Zhang et al., 2011). In general, the learning processes in these frameworks are based not only on videoed lessons but also on additional materials related to teaching and learning – "records of practice" – such as, examples of student assignments, lesson plans, study materials, etc. Such materials enable the teachers to learn about their own and others' practices and about student learning without being physically present in the classroom. They can thus examine teaching strategies and discuss ways to improve them (Borko et al., 2008; Kazemi & Franke 2004; Little et al., 2003).

One of the unique characteristics of video, which makes it useful when working with teachers, is that it provides documentation of classroom activities – documentation that can be worked with in a dynamic manner (viewing a tape repeatedly, with each viewing focusing on another aspect, stopping, rewinding, etc.). Another characteristic is that it is possible to collect video clips, edit them and reorganize them in a format that differs from the original presentation (for example, not in chronological order, or by dividing it into parts), or to link them to additional media (such as text, graphics, or another video). The combination of these characteristics makes it possible to design different ways for analyzing teaching and learning and to reflect upon them with the teachers.

In discussing video-recorded lessons, the video confers a concrete reference point for the discussion which is not colored by the experience of a single teacher who mixes his own personal experience into the observation or reflects from himself onto the situation (Clarke & Hollingsworth, 2009). These discussions help the teacher to refine his professional vision, which is the ability to distinguish, understand and interpret central characteristics of the interactions that occur in the classroom (Sherin & van Es, 2009). The importance of this ability is stressed in different programs that focus on different attributes of teaching such as students' thinking and learning (Borko, Koellner, Jacobs & Seago, 2011). Video-recorded lessons also serve as support for teaching specific content. An example is the Learning and Teaching Geometry (LTG) project in the United States, designed to support middle school mathematics teachers teaching geometry (Borko, Koellner, Jacobs & Seago, 2011).

Viewing videos on their own is not sufficient; they must be accompanied by guidance and training. Brophy (2004) points out that in viewing video-recorded lessons, teachers' opinions about effective teaching often influence their observation and interpretation. According to Erickson (2007), this tendency is particularly problematic especially on the part of experienced teachers who project from their own experience onto the interpretation of the observations and even "adapt" what they have seen to their opinions on teaching and learning. For instance, distorting observations on phenomena and adapting them to previously held perceptions and conceptualizations is a familiar phenomenon among learners (Novick & Nussbaum, 1978, Margel, Eylon & Scherz, 2008).

There is no single correct method for developing and operating a program to accompany teacher learning, but there is consensus in the professional literature on several main characteristics of meaningful frameworks: they are long term, relate to teachers as learners who are themselves going through significant learning processes, they take place within the context of the work of teaching and address all the components of teaching, of student learning and the interaction of teachers, students and learning material (for example, Borko, 2004; Borko et al., 2008; Whitcomb et al., 2009; Loucks-Horsley et al., 1998; Hawley & Valli, 1999). Significant learning for teachers is a slow and uncertain process. There are teachers who change more than others as a consequence of participating in a professional development program, and in teachers' practice and knowledge, there are particular aspects that are easier to change than others (Borko, 2004).

Key principles for designing a program for teachers' professional development (for example, such as Van Driel et al., 2012, Lefstein & Snell, 2013) relate to the importance of:

1. Determining a clear focus for the program and raising teachers' awareness in its regard. In Van Driel's review, this principle was identified as a central attribute of programs that met with "success." One of the topics widely discussed in the activity was choosing frameworks on which to focus in teacher learning and as a result, planning the teacher learning framework and choosing and designing the video-recorded lessons which serve as the objects of joint study and discussion. Selecting the focus of the learning frameworks relates to major issues relevant to teacher learning and is not presented here in this introduction: What is important for teachers to learn? (Objectives) How do teachers learn? What factors influence their learning? How can teachers' learning processes be aided?
2. Management of the teacher learning frameworks through dialogue – frameworks wherein the teachers' voices are heard and they are able to present a critical attitude toward knowledge, to think together and to enjoy relations of concern and support.
3. Learning within a supportive professional community that facilitates development of language, vision, ownership. Teachers learning from one another through handling shared problems and working jointly on daily tasks such as choosing study materials, planning lessons, creating assignments, reacting to problems and relating to specific students.
4. Motivating learning processes through evidence originating in the classroom (Eylon et al., 2008; Harrison et al., 2008; Borko et al., 2008)

5. Active involvement in structuring and interpreting knowledge while balancing external and internal sources of knowledge.
6. Learning that is ongoing and not one-off and which reflects coherence of different types: between different types of learning frameworks and their design and between the program goals and general policy at different levels in the system (the school, the district, the state). Research indicates the importance of integrating learning frameworks for teachers in an actual context of teaching and school efforts to improve teaching through teachers' professional development. At the same time, there is no need for the system to operate within the school when, for example, it is not possible to bring the appropriate expertise and training to the school, or when the focus is on teaching a content area that does not have a critical mass of teachers in the school. This subject will be dealt with at length in the report.

Planning programs that guide teacher learning is influenced by the perceptions program developers have of teaching and learning. The schema below, prepared in line with Lefstein (unpublished paper, 2013), organizes the various aspects of video use via metaphors of learning and teaching. In discussions, it was stressed that the univalent correspondence between the components in the "Learning metaphor" column and the components in the columns dealing with objectives and characterization of teaching can be misleading. Thus, for instance, the objectives appearing in the context of the first metaphor (transferring knowledge and skills) can be promoted through a constructivist approach to teaching which characterizes the second learning metaphor.

Learning metaphor	Objectives	Teaching is mainly...	Typical activities of ongoing professional development	Key conditions	Potential role of video
Reception	Transferring knowledge and skills	Implementing beliefs, knowledge, skills and techniques	<ul style="list-style-type: none"> - Brief workshops, seminars, courses, academic degrees - Syllabi, textbooks and teacher manuals - Mentoring and guidance 	<ul style="list-style-type: none"> - Expertise (generally, external) - Knowledge and well-defined goals 	<ul style="list-style-type: none"> - Demonstrating best practices - Assessment and supervision
Construct-ion	Developing a reflective teacher	Complex and clear practice	<ul style="list-style-type: none"> - Research / study by the teacher - Study groups (for ex., a video club) - Trials and modifications of study materials 	<ul style="list-style-type: none"> - School-wide assistance with the process - Ongoing 	Source of evidence in the study and process of improvement
Participat-ion	Development of a professional learning community	Socially decentralized, culturally ingrained, function of identity	<ul style="list-style-type: none"> - Researching the lesson - Joint teaching and other types of cooperation - Routine peer feedback 	<ul style="list-style-type: none"> - Learning integrated into the work process - Supportive structures and processes 	Source of evidence in the study and process of improvement

1.3 Description of the Meetings

The First Meeting:

The aim of the first meeting was to get all the members acquainted personally and professionally, to raise the main theoretical and practical topics for discussion and to describe the state of affairs in Israel with respect to the use of video to evaluate teachers and for their professional development. Ahead of the meeting, the group members responded to a questionnaire designed to clarify their attitudes toward the activity topic, their expectations and their experience in the field (see Appendix 1). The responses were distributed among the participants and those interested were invited to present their experience at the meeting. Two main areas were discussed at the meeting. The main points of the lectures appear in Appendix 2.

1. **Use of measurement tools to improve teaching:** In 2011, the education system began a process to regulate teacher assessment in which RAMA (Hebrew acronym for the "National Authority for Measurement and Evaluation in Education") played a central role. Selected aspects of assessment were described in the session: principles, considerations and constraints by which RAMA was guided in their development of the teacher assessment tool (see the Hartaf lecture in Appendix 2); implementation of an online process of summative evaluation for student teachers and insights gained from the process (see the Fairstein lecture in Appendix 2); the principal's perspective vis à vis the challenges of useful teacher assessment (see the Gutti lecture in Appendix 2).
2. **Use of video for professional development of teachers:** The models used by the Branco Weiss Institute for the pedagogic development of teachers with the aid of video-recorded lessons and pioneering programs designed to test the degree of these models' effectiveness were presented (see the Salamon lecture in Appendix 2); a study was presented describing the use of videos for professional development of teachers in a research laboratory (see the Taitelbaum lecture in Appendix 2); the perspective of the media content developer was presented, citing the "elusive nature" of documentation and the role of the director in proactively intervening in "documentary reality" was discussed (see the Ofer lecture in Appendix 2).

The Second Meeting:

This meeting was spread over three days: On the first day there was a symposium, open to the public, on the topic of "Video-recorded Lessons as a Component of Teachers' Professional Development," and on the other two days, workshops for the study group members were held and led by the guest lecturers.

The second meeting had two objectives: The symposium was intended to enable the public at large to familiarize themselves with innovations in the field of video-recorded lessons for the purpose of teachers' professional development and its inherent potential, and it allowed stakeholders to get to know additional professionals active in the field. The workshops were designed to permit the study groups to learn about the topic, to thoroughly discuss selected aspects and to acquire practical knowledge in the area of assessment and technology. In

order to justify assessment-based professional development in Israel, its efficacy must be established and it must be demonstrated that an infrastructure for its implementation exists. The guests from abroad, who collaborate with one another in assessment-based professional development, presented their experience in teaching evaluation and professional development of teachers and described a study that reinforces the validity of the teacher assessment tools they developed. The local lecturers presented RAMA's and the Ministry of Education's perspective on this issue.

The symposium addressed two main topics:

1. **Frameworks for evaluating teachers:** Prof. Charlotte Danielson lectured on "Framework for Teaching," which she developed, its origins and applications, and on research concerning the validity of the evaluation tools - Measures of Effective Teaching (FFT, among them). Prof. Michal Beller, RAMA executive director, discussed the "RAMA tool" for teacher assessment. She described the rationale for its development, which was based on a comprehensive review of the teacher assessment tools used around the world. RAMA's approach is similar to that of FFT.
2. **Use of video-recorded lessons for the purpose of professional development:** Mr. Mark Atkinson, "Teachscape" founder, lectured on integrating Teachscape (software for working with video-recorded lessons) and FFT for teachers' professional development. Mr. Moti Rosner, director of the Ministry of Education's Division A for Teachers' Professional Development, described the state of affairs in Israel from the standpoint of using observation systems to aid in teachers' professional development, and reviewed its inherent potential and challenges.

In order to critically examine possible implementation of assessment-based professional development models in Israel, two panel discussions were held in which, alongside the lecturers, two teachers, a school principal and a representative of academia participated. They represented varied interest groups involved in videoing lessons, in evaluation, and the professional development of teachers.

The goal of the workshops that were held following the symposium was to provide study group members with some practical experience using teaching evaluation tools (both the FFT and RAMA's tool) and in the use of video for professional development. On the first day of workshop learning, a discussion was held with the guest lecturers on the main issues relating to the use of video-recorded lessons to evaluate teachers and on the topic of professional development that relies on pre-defined criteria-based assessment. Workshops were held in which participants viewed a video-clip and practiced evaluating the teaching depicted on the basis of the FFT and the RAMA tool. Generic and specific aspects of math instruction were also discussed. On the second day, the guests lectured on the "Stanford model" for professional development and on the professional discourse and worked with small groups on specific topics connected to working with Teachscape applications and to assessment-based professional development.

The Third (Concluding) Meeting:

Ahead of the third meeting, a questionnaire was circulated concerning the possibility of integrating generic tools (not specific to the field of education) to assess teachers - with various professional development models. The respondents were also asked to select topics for further group study. Many asked that the topic of professional development based on video-recorded lessons in Israel be addressed and this was indeed the topic of the third meeting.

The members participated in workshops focusing on different professional development models: both generic and relevant to specific disciplines, assessment-based and not. Following the workshops, a discussion was held comparing the different aspects of the professional development models.

During the meeting, four workshops were held and led by group members. The workshops were intended to be a simulation of professional development workshops that the workshop leaders hold for teachers. The first workshop was held in an expanded format with the entire study group and led by Dr. Adam Lefstein of Ben-Gurion University of the Negev, a member of the group's steering team. Dr. Lefstein presented an anthropological-linguistic analysis of student behavior during the lesson. Following the general workshop, another three were held and took place in parallel. They were led by Dr. Ronnie Karsenty of the Weizmann Institute of Science; her focus was disciplinary aspects of teaching mathematics; Ms. Ofra Ratner-Abrahami of RAMA focused on the interaction between the teacher and the students; and, Ms. Irit Wolfgor of the Branco Weiss Institute presented a generic approach to professional development. Dr. Esther Bagno of the Weizmann Institute of Science and Ms. Ada Chen of CET (Center for Educational Technology) reviewed the professional development models that serve their institutions.

Following the lectures, a discussion on the advantages and disadvantages of the different professional development models was led by Prof. Eylon of the Weizmann Institute of Science, chair of this activity's steering team. Among other things, there was disagreement with respect to the primary focus of analysis of the lesson and the development - on training content, or on the teacher-student interaction; there was also a debate with respect to holding training in the local school or within a professional community. These disagreements are a consequence of the differences in approaches that either support assessment-based professional development or non-assessment based, and either a generic approach, or one that is oriented to the particular discipline being developed and assessed.

The meeting concluded with a lecture by Dr. Tammy Halamish-Eisenmann on the Trump Foundation's rationale for the basis of the activity, followed by a review of the information provided by Dr. Sergei Talanker regarding the structure of the present report.

3. Conclusions and Discussion

The activity described in this document addressed the pedagogical and content considerations that arise from video-recorded lessons used for teachers' professional study. The use of video-recorded lessons, whether for individual study or for learning taking place in settings involving discourse with colleagues or mentors, is not novel (see the annotated review by Miriam Sherin [2004] in Appendix 4). In the discussions the group held, familiarity with the technological development in photography and video editing, with computerized storage systems, photographic tagging and retrieval, support for managing flexible learning, as well as the large databases containing accessible examples raised new possibilities that were not possible in the past due to technical aspects and the complexity of managing learning (see the Atkinson lecture in Appendix 2). Thus, for example, the possibility of using video-recorded lessons to connect between the teacher's actions, the discussion among a group of students (with or without the teacher), and class discussion – creates new opportunities for teacher learning and is today feasible, without any great investment, through proper planning of videoed classes. However, the use itself of video-recorded lessons as records of practice does not necessarily lead to activities that promote teacher learning (see the annotated review based on the first chapter of the book by Lefstein & Snell, 2011). The discussions pointed to the importance of the perceptions held by the mentors or evaluators of teacher learning in this context and to the pedagogical challenges of integrating video-recorded lessons in assessment processes (see the Guti lecture in Appendix 2).

The discussions brought to the fore topics about which there was consensus among the group members. For example, everyone agreed that professional discussion concerning the video-recorded lessons was a powerful means for learning and that guiding and mentoring teacher learning accompanied by reflection and meta-cognition are critical for the effective use of videos or other representations such as student assignments. On the other hand, there was a variety of opinions and approaches to the question of how to lead an activity with these characteristics. There was also general agreement with respect to one of the barriers being the judgmental aspect involved ("this is not a good lesson, I would do it differently"), which impairs the ability to observe phenomena with an open mind and can harm the discussion and analysis which should allow for multiple perspectives. One of the criticisms the participants raised against professional development in the context of evaluation was that it strengthens the tendency to be judgmental.

Many questions that were raised during the activity did not receive clear answers but the discussions allowed for the different approaches to be refined and brought up relevant dilemmas. For example: What are the characteristics of a good video? What kinds of videos should be recorded? Videos that present best practices or, perhaps, in particular, those that present "problematic" examples that stimulate discussion? (See the summary of the first panel discussion in Appendix 2). How will the choice of video be adapted to the goals of the teacher learning? What is "quality teaching"; can it be characterized? (See the Hurvitz lecture in Appendix 2). Is it appropriate to characterize optimal teaching using indicators such as those of the FFT? Is it possible to characterize (tag) videos for teacher learning purposes, and how can it be done?

Of the many questions and topics that inspired discussions and brought up a variety of approaches, we will relate here to a few topics:

1. The degree of validity and reliability of observation instruments:

The participants were divided regarding the effectiveness of certain tools and also the approach itself. The workshops indicated the difficulty in assessing lesson excerpts given their very limited context. The study group members are not certified evaluators in any one of the tools presented in the workshops and most had only limited familiarity with the tools, and to date, the RAMA tool is still in its draft form. It is thus not possible to draw conclusions regarding the reliability and validity of some, or all, of the assessment instrument on the basis of the study group members' limited experience.

The workshop in which professional development using the RAMA assessment tool was presented did not allow for an estimation of its effectiveness since, among other things, the participants found it difficult to agree on their assessment of the lesson excerpt as presented according to the RAMA indicators, which made presentation of implementation of the model for development difficult.

2. Primary focus on analysis of the lesson and professional development: Training content or teacher-student interaction:

This concerns a clash between philosophical approaches. These approaches are deeply rooted among people working in the field of teacher training for many years and their activity is based on certain assumptions that form the foundations of the approaches. Partial agreement was attained concerning the position that content-oriented and interaction-oriented approaches complement one another but it must be emphasized that, as mentioned, agreement on this point was only partial. These approaches also affected the attitudes toward the following question.

3. Structuring professional development programs around communities of teachers according to schools vs. according to subjects:

Within the framework of the education reforms and in light of research findings regarding the importance of anchoring professional development systems in school setting, the problem came up of being able to provide a response to teachers of middle school disciplines in which there is no critical mass of teachers of specific subjects in the school and there is no possibility of providing a professional response in that framework. What is of concern is the necessity of building regional and even trans-regional frameworks that will serve as a place of teachers' continuing learning and for creating the adaptations required to meet the demands of the educational reforms. This topic will be addressed later on in the chapter.

4. Is there room for several types of discourse on professional development?

When there is uniformity of discourse on assessment and development, things are simpler for the teachers, principals and teacher educators. In contrast, uniformity alienates the

different/other and does not leave room for the multiple theoretical and practical perceptions of teaching to which we are witness today. This question is one of philosophy and cannot be answered within the framework of this activity. One of the suggestions was to have, in parallel, a number of "languages" that are familiar to the professional community, but this was not discussed as a realizable project.

5. The focus of learning from video-recorded lessons:

A clear and explicit definition of objectives and foci for teachers' learning activity aided by video-recorded lessons and raising teachers' awareness in this regard are critical conditions for the success of the activity. This step was identified in Van Driel et al's (2012) review as a main design principle of programs that were "successful" in developing teachers professionally. Experience in viewing and analyzing videos in the workshop setting demonstrated the mentors' judgment in choosing a "good video." For example: In the workshop led by Dr. Lefstein, he presented an approach for guiding discussion among teachers whose goal is for them to develop awareness, sensitivity and skill in identifying students' norms of participation and learning. He presented the richness inherent in a most detailed ("micro") observation of students' conduct in a literature lesson (including hand movements, interactions between students, and more). The very brief video clip that showed the students' participation processes was analyzed in depth and enabled various examples of student participation to be brought up, examples that shed a completely new light on the conduct of the lessons and the teacher's reactions. In this case, a video that does not facilitate a detailed view of the students' behavior during the lesson and the interactions taking place between them would not be a "good video" from the perspective of teacher learning.

Another approach demonstrated in the workshop led by Dr. Karsenty was designed to enhance teachers' knowledge of the construction of mathematical and meta-mathematical ideas by students. She placed emphasis on the teacher and her considerations in decision-making, and used the video to bring up possible decision making processes, even if they did not "actually" take place. In this example, a "good video" is one that leads to a rich discussion on the variety of possible considerations on the part of teachers in the context of building mathematical and meta-mathematical ideas in the lessons.

Examples of different models are described in the annotated bibliography (Sherin, 2004, in Appendix 4). For further examples, see Borko (2010).

6. The role of content knowledge within the framework of generic observation instruments:

Teaching always takes place in a content-related context and there was group consensus that reference to specific content must occur. Videoed lessons always address particular subject matter and therefore in the learning processes there is always a clear expression of both generic aspects and discipline-related aspects. However, as mentioned above, differences in the learning objectives of video-recorded lessons influence the place of

disciplinary knowledge in learning. Many discussions related to the question of how the content aspect is expressed in the FFT system and in mentoring processes that make use of that system. The guest lecturers emphasized the importance of the content-related context and noted that at this stage it is found in the specific examples for each category of the tool. The many videos in the database make it possible for different levels of teaching to be presented as well as alternatives for teaching the same subject matter. In a considerable number of the frameworks in which the FFT system is used, the activity is performed by observers or mentors with subject matter background (for example, math teachers) who adapt their mentoring to the teachers' needs. Nevertheless, the feedback received regarding tagging of content in the large video database indicated that the current method in which content-related aspects are reflected raises difficulties when attempting to arrive at a clear characterization. This is one of the challenges Danielson and her colleagues face and they are currently involved in developing discipline-related versions of the system. The [MQI](#) system (Mathematical Quality of Instruction) was presented in the activity. This system places a clear emphasis on the teachers' and students' mathematical activity and relates to the nature of the mathematical knowledge at the students' disposal as manifested by teacher-student, teacher-content and student-content interactions (Cohen, Raudenbush & Ball, 2003). This system is one of the five involved in the MET project. The MQI program has 25 codes organized into five dimensions; it is a system that can be used to teach teachers, to evaluate the mathematical content that curricula call upon and for formative evaluation for teachers (see the summary of the MET report in Appendix 4). The system has simple representations (LITE) mainly relating to the five dimensions and also has complete representation via the categories. It was found that for the purpose of program evaluation, the LITE version is sufficient but for teacher learning, the complete system with the categories is needed.

7. The use of observation instruments in learning from videos:

The views on this topic were divided. The FFT is based on the assumption that it is possible to define "quality teaching" in a generic manner which is independent of the teaching method or specific content. A detailed system of categories was constructed in order to operationally define characteristics of different levels of teaching. In the lectures and discussions, Danielson and Atkinson stressed the fact that a generic tool such as the FFT, which has a clear structure and is not dependent upon the teaching method, can have many uses such as lesson preparation, professional development at different levels (for students studying education, mentors for beginning teachers, and structuring professional development for in-service teachers), and different aspects of assessment (recruiting and employing teachers, performance evaluation). They argue that utilizing a clearly structured tool for many purposes enables coherence and effective training of mentors. The RAMA team presented the concept guiding development of their assessment tool as well as the system according to which it operates, a concept which is similar to that of the FFT. In Israel, the uses made of RAMA's tools for professional development purposes and the use of the accompanying system for training and professional development purposes are in the initial stages of development and trial. From familiarity with the complex and rich system that was developed for learning from video-recorded lessons as presented by the guests,

there is apparently the possibility of building systems guided by guidelines of different types, systems that would enable a flexible connection between generic aspects and content-related aspects and which would be modified in line with the category system that corresponds to the learning method and particular guidance. The flexibility that currently exists in such systems enables alternative uses by different target groups (for example, individual teachers, groups of teachers, researchers) according to different emphases. Specifically, it is possible to construct systems to support a certain pedagogical approach such as, for example, a system with unique disciplinary emphasis. There is negotiation ongoing for the use of systems developed abroad for needs in Israel. Despite recognition of the importance of indicators for evaluation and their possible contribution to teacher learning, in various discussions the question arose as to whether use of an indicator is a necessary tool for teacher learning or, can a series of leading questions be more useful? Leading questions, as distinguished from an indicator, do not assume correct answers and can therefore be valuable for developing thinking (see the first panel discussion).

Each one of the approaches presented by the participants made extensive use of questions as a means to stimulate open discussion and debate, and the presenters' experience working with teachers and the great value of this methodological approach were evident. It is important to note that in the learning and guidance-supported systems the guests presented, the use of leading (open) questions was integrated as a main didactic method. Nonetheless, everything referenced the structured system of the FFT.

Lessons Learned and Future Steps

- 1. Coherence:** In his remarks at the symposium, Moti Rosner related to the need for policy that will ensure the coherence of actions in whose framework teacher learning in a viewing system will take place (see Appendix 2). Since this is a new initiative at all levels of the system, in the context of teachers learning from video-recorded lessons it is most important that the process not be perceived as an isolated initiative so as to improve the chances for the activity to continue (Desimone, 2009). As was mentioned in the group discussions, too close a connection between frameworks for learning from video-recorded lessons and teacher assessment can harm the chances of attaining the necessary conditions for meaningful learning (for example, trust) or the willingness to continue using observation systems beyond the assessment stages.
- 2. Ministry of Education activity:** In this activity the policy in the context of learning from videos and the steps taken to promote use of videos was reported. For the next school year, at the Ministry of Education's initiative, a pilot project that will be accompanied by evaluation is about to be begin; it will use different approaches to integrating videos for teacher learning. Similarly, attempts are being made to begin this kind of activity at the regional level and to train leading teachers who will, in the future, be assimilated into the system using the fan approach.
- 3. Collaboration:** The activity created opportunities for participants who share interest in using video-recorded lessons to become acquainted and this led to cooperation and collaborations.

4. **ICT platforms for learning from observation systems that are suitable for use in Israel:** Several options for constructing or adapting such platforms are being examined.
5. **Constructing a national video database:** Is there a need to construct such a database. If so, what will its characteristics be? Who will establish it? Initial conversations on this topic took place during the course of the activity but there is a need for more thorough discussions.
6. **Continued study:** The subject on which this activity focused continues to progress at a rapid pace. It is important to continue following pedagogical and technological developments.

Appendices

Appendix 1: Meeting Agendas and Accompanying Materials

A. First meeting: How Teachers Learn from Video-recorded Lessons?

January 2013

To see the booklet of background materials, [click here](#).⁴

Meeting agenda:

09:30-09:40	Opening remarks: Dr. Avital Darmon , Director, The Initiative for Applied Education Research
09:40-11:40	<p>First session: Using measurement tools to improve teaching</p> <p>Session chair: Prof. Abraham Arcavi, Weizmann Institute of Science Principles and consideration guiding RAMA in developing the teacher assessment tool (click here to view presentation)</p> <p>Dr. Hagit Hartaf, Director, Training Division, RAMA Ms. Ofra Ratner-Abrahami, Training division manager, RAMA How can we achieve useful teacher assessment? (click here to view presentation)</p> <p>Mr. Ali Gutti, Principal, Hassan Arpa Elementary School, Jaffa The process of assessing student teachers (click here to view presentation)</p> <p>Ms. Esti Fairstein, Nationwide instructor, Pre-Service and Entry into Teaching Division, Ministry of Education The use of video documentation to select the recipient of the Quality Teaching award (click here to view presentation)</p> <p>Mr. Eli Hurvitz, Executive director, Trump Foundation</p>
12:00-15:00	<p>Second session: Group members relate their experience with video</p> <p>Session chair: Dr. Adam Lefstein, Ben-Gurion University of the Negev Models of pedagogic development for teachers with the aid of video-recorded teaching lessons – case description (click here to view presentation)</p> <p>Mr. Yoav Salamon, Director, Research & Development, Branco Weiss Institute Use of video clips as an aid in the professional development of chemistry teachers in the research laboratory (click here to view presentation)</p> <p>Dr. Dorit Taitelbaum, Chief inspector for chemistry, Ministry of Education On the elusive nature of documentation (click here to view presentation)</p> <p>Mr. Ron Ofer, Media content developer, Development team, Avney Rosha The TIMSS video international study – Teaching as a cultural activity</p> <p>Dr. Tammy Halamish-Eisenmann, Program officer, Trump Foundation</p>

⁴ All links to background materials, presentations, etc. are to the Hebrew-language versions.

15:20-16:40	Third session: Scientific validation of teacher assessment tools
	<p>Session chair: Prof. Bat-Sheva Eylon, Weizmann Institute of Science</p> <p>The MET (Measures of Effective Learning) project: From evaluation of teaching to policy formation</p> <p>Dr. Yaron Lehavi, Senior lecturer, David Yellin College of Education</p> <p>FFT (Framework for Teaching): The teacher assessment measurement tool</p> <p>Prof. Bat-Sheva Eylon, Weizmann Institute of Science</p> <p>Work in groups and group discussion</p>
16:40-17:00	The day in summary

B. Symposium: Video-Recorded Lessons as a Component of Teachers' Professional Development

February 2013

To see the booklet of background materials, [click here](#).

To view the video-recorded lectures and the accompanying presentations and abstracts, [click here](#).

09:00-09:15	Opening remarks: Dr. Avital Darmon , Director, The Initiative Mr. Eli Hurwitz , Executive director, Trump Foundation
09:15-11:00	First session: Using video-recorded educational activity for teachers' professional development
	<p>Chair: Prof. Bat-Sheva Eylon, Weizmann Institute of Science</p> <p>Framework For Teaching (FFT): Roots, research and applications Prof. Charlotte Danielson, Founder, Danielson Group.</p> <p>Integrating Teachscape and FFT for teachers' professional development</p> <p>Mr. Mark Atkinson, Founder, Teachscape</p> <p>The potential and challenges of using observation systems in CPD</p> <p>Mr. Moti Rosner, Director, Division A – teachers' professional development, Ministry of Education.</p> <p>Panel discussion with: Prof. Charlotte Danielson, Mr. Mark Atkinson, Mr. Moti Rosner, Dr. Adam Lefstein and Mr. Gali Shimoni.</p>
14:00-15:00	Second session: Tools for evaluation of teaching
	<p>Chair: Dr. Atara Shriki, Oranim College of Education</p> <p>The use of FFT as a tool for teacher evaluation Measures of Effective Teaching research findings,</p> <p>Prof. Charlotte Danielson, Founder, Danielson Group</p> <p>The tool for teacher evaluation and its potential for teacher development</p> <p>Prof. Michal Beller, Executive Director, RAMA (National Authority for Measurement and Evaluation in Education)</p> <p>Panel discussion with: Prof. Charlotte Danielson, Mr. Mark Atkinson, Prof. Michal Beller, Mr. Ali Gutti, and Ms. Ayelet Levin-Schnur</p>

Following the symposium there was a two-day workshop in which Prof. Charlotte Danielson and Mr. Mark Atkinson were guests.

Workshop agenda:

Day 1:	
	Opening remarks: Prof. Bat-Sheva Eylon
09:00-14:00	Session 1
	<p>Chair: Dr. Hagit Hartaf</p> <p>Video 1: Watch, discuss in small groups, report to plenum Conversation with Prof. Danielson: Clarity in defining good teaching for coaching and for evaluation</p> <p>Conversation with Mr. Atkinson: Teachscape tools to train for accuracy of judgment (FFTs) to inform conversation</p> <p>A walk through FFT's training for a single component (3c: Engaging students in learning)</p> <p>Video 2: Watch, discuss in small groups, report to plenum</p>
14:00-17:00	Session 2
	<p>Chair: Mr. Yoav Salamon</p> <p>Using video for professional learning: Models and practical considerations</p> <p>Findings from the DG experience on teacher self-assessment, reflecting on practice and professional conversation to promote learning</p> <p>Conducting professional conversations</p> <p>Concluding discussion coordinated by Dr. Adam Lefstein</p>
Day 2:	
9:00-10:30	Two parallel workshops, one run by Mr. Atkinson and one by Prof. Danielson with up to 10 participants. Mr. Atkinson will focus more on technological aspects and the use of Teachscape and video-based technologies in general and Prof. Danielson will focus more on professional development models, in particular the development of lead teachers and discipline-oriented development and evaluation.
11:00-12:30	Continuing the previous workshops
13:30-15:00	Personal sessions with two groups: Prof. Danielson with the RAMA group and Mr. Atkinson with the Branco Weiss group.

C. Third session: Concluding meeting of the group studying "How Teachers Can Learn from Video-Recorded Lessons."

April 2013

To see the booklet of background materials, [click here](#).

To see the outline of topics for discussion in light of the workshops, [click here](#).

Meeting agenda:

07:15-9:00	Summary of the activity and its reflection in the final report Dr. Sergei Talanker , Activity coordinator
09:15-12:00	Workshop A: Teachers' professional development using detailed analysis of videotapes
	Moderators: Group 1 (Participants with a mathematics background): Dr. Ronnie Karsenty , Weizmann Institute of Science Group 2 (Mixed group): Ms. Ofra Ratner-Abrahami , RAMA Group 3 (Participants with no mathematics background): Ms. Irit Wolfgor , Branco Weiss Institute Plenum: Presentation of the groups' conclusions, concluding discussion and comparison Moderator: Dr. Atara Shriki
12:50-14:20	Workshop B: Design and guidance of learning processes based on video-recorded lessons
	Moderator: Dr. Adam Lefstein
09:15-12:00	Summation
	Moderator: Prof. Bat-Sheva Eylon Discussion – Insights and conclusions from Workshops A and B Presentation of study group participants' projects Open discussion: Where do we go from here? Summary Dr. Tammy Halamish-Eisenmann

Appendix 4: Summaries of Major Articles and Bibliography⁵

Below is the list of summarized articles:

1. סיכום דוחות המחקר של פרויקט ה-MET (מדדים להוראה יעילה)
2. Harrison, Hofstein, Eylon, & Simon (2008) "Evidence-Based Professional Development of Science Teachers in Two Countries"
3. Zhang, Lundeberg, Koehler & Eberhardt (2011), "Understanding affordances and challenges of three types of video for teacher professional development"
4. Lefstein & Snell (2011), "Professional vision and the politics of teacher learning"
5. Sherin (2004) "New Perspectives on the role of video in teacher education"
6. הרטף ובלר (2011) תהליך הערכת מורים בישראל: צעדים ראשונים ומחשבות לעתיד
7. Marshall (2005). It's Time to Rethink Teacher Supervision and Evaluation, Phi Delta Kappan
8. משכית, ליברמן ואקרמן-אשרה (2012). ממתמחה למורה: מה ניתן ללמוד מתהליכי ההערכה של מתמחים בתום שנת עבודתם הראשונה במקצוע ההוראה? – דוח מחקר
9. Hattie (2003) Distinguishing Expert Teachers from Novice and Experienced Teachers
10. Seidel, Stürmer & Blomberg (n.d.) The role of video material in teacher professionalization: Does it matter to observe your own videotaped lesson or the video of an unknown colleague?
11. בורשטיין (2004) תיעוד, סרט תיעודי, בדיה
12. Stigler & Hiebert (2009) Closing the Teaching Gap
13. כץ (2008) כיצד משנים תיעודי שיעורים בווידיאו את היכולות הרפלקטיביות של המורים על התנסויותיהם?

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⁵ The Hebrew original includes the summaries of the major articles.

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Appendix 5: Biographical Sketches of the Steering Committee and Study Group Participants and Guest Lecturers

Steering committee members

Prof. Bat-Sheva Eylon, Professor at the Weizmann Institute of Science. Prof. Eylon heads the Department of Science Teaching, is head of the Junior High School Science and Technology Group, and serves as an academic advisor to the National Teacher Centers in physics and science and technology for junior high-school. Prof. Eylon is also the pedagogic director of the Rothschild-Weizmann Master's degree program at Weizmann Institute for outstanding science and mathematics secondary school teachers. She is a member of the American Association for the Advancement of Science (AAAS). Prof. Eylon's main areas of research interest are the study and instruction of physics in middle school (grades 7 to 9) and CPD (continuing teacher development) for both teachers and teacher educators of physics and the sciences.

Prof. Eylon holds a PhD degree in science education from the University of California, Berkeley.

Chair of this activity's steering committee.

Adam Lefstein, Senior lecturer in the Department of Education at Ben-Gurion University of the Negev. Formerly, he was a lecturer in the Institute of Education at the University of London; he also directed the Community of Thinking program at the Branco Weiss Institute in Jerusalem. His research focuses on the intersections of policy, pedagogy and classroom interaction. He is at the forefront of research studying processes of continuity and change in patterns of interaction in the classroom, dialogic teaching and the use of video for teachers' professional development.

Dr. Lefstein holds a PhD degree in education from King's College London, received in 2005.

Member of this activity's steering committee.

Dr. Atara Shriki, Senior lecturer at the Oranim College of Education and from 2003 to 2007, was head of the college's Mathematics Department. She teaches in the college's Unit for Training Secondary School Teachers, in the Department of Mathematics Education, and in the Master's degree program in Science Teaching. In the capacity of her work at the Technion's Center for the Advancement, Improvement and Revision of Mathematics Education, known as "Keshet Cham," she directed the teacher training programs for leading mathematics teachers, organized seminars for mathematics knowledge area coordinators, developed and created subject material for math teachers and teacher educators, and was the Center's representative to the Ministry of Education, mathematics inspectors, pedagogic center directors and their math section coordinators.

Dr. Shriki holds a PhD degree in technology and science teaching from the Technion in Haifa, received in 1996.

Member of this activity's steering committee.

Dr. Sergei Talanker, Academic coordinator – for group studying the topic of "How teachers can learn from video-recorded lessons." Managed the translation department at IGMI Ltd in Haifa, has taught philosophy of education at the Gordon College of Education in Haifa, led in-service courses on behalf of the Home Front Command for teachers in schools in the north of the country on the topic of behavior of the populace in emergency situations. He is also a martial arts instructor.

Dr. Talanker holds a PhD degree in philosophy from the University of Haifa, received in 2011.

Study Group Participants

Ms. Hila Arazi-Hatav, member of the development team at the Avney Rosha Institute for School Leadership and director of the success documentation program run jointly by the Institute and the Trump Foundation. Arazi-Hatav teaches in programs for gifted children, in which she integrates media including representations of the world of education in cinema as compared to the students' internal documentation and videotaping of their lives at school. Ms. Arazi-Hatav holds a Master's degree from the Hebrew University and a teaching certificate from the "Revivim" program, received in 2006; she is a graduate of the screenwriting track at the Sam Spiegel Film and Television School (2009).

Prof. Abraham Arcavi, professor at the Weizmann Institute of Science's Department of Science Education, which he headed from 2001 to 2005. Prof. Arcavi is involved with research, development and teacher training in mathematics education; he currently serves as the general secretary of the International Commission on Mathematical Instruction (ICMI). He heads the "LENS" project, building a database of videotaped math lessons at all levels and constructing a framework for specialized analysis of the lessons with the goal of improving instruction.

Prof. Arcavi holds a PhD degree in mathematics education from the Weizmann Institute of Science, received in 1986.

Mr. Zvi Arica, Ministry of Education chief inspector for physics. His main areas of expertise are physics education, and specifically, learning through physics projects and physics teachers' professional development.

Mr. Arica holds an MSc in physics from the Hebrew University, received in 1993. He is a research student in science teaching at the Weizmann Institute.

Dr. Esther Bagno, Weizmann Institute of Science, the Department of Science Teaching. From 1969-1986, she was a physics teacher in the Bnei Brak municipal high school and municipal religious high school. She is a member of the Department of Science Teaching's physics group (1983-2012), where she carried out her studies for her Master's and Doctoral degrees (1994). Dr. Bagno currently heads the National Center of Physics Teachers. Her main areas of interest are research and development of frameworks for physics teachers' professional development and "learning-focused" teaching strategies.

Ms. Ada Chen, Head of the administration for professional development projects at the Center for Educational Technology. She is involved in developing models for distance learning.

Ms. Chen holds a Bachelor's degree from the David Yellin College of Education in Jerusalem, received in 1992 and a Master's degree from University of Derby (UK), received in 2000.

Mr. Ali Gutti, Principal, Hassan Arpa Elementary School in Yaffo; started his professional path in 1979 as a history teacher in the 12th Comprehensive High School. In 1980, he was appointed vice-principal of the school. While working in the school, he established the tracks in Middle Eastern studies and in Islamic studies. In 1986, he was selected to be principal of the Hassan Arpa Elementary School in Yaffo. In 2008-2009, he was chosen to serve as instructor and mentor to new principals in the Tel Aviv district. He holds a Bachelor's degree in history and Islamic studies, is a graduate of the principals course, holds a teaching certificate and teaching license and a Master's degree in educational and organizational administration from Tel Aviv University. In 2010, Mr. Gutti completed his training at the Avney Rosha Institute as a principal. He currently works as a system principal in Yaffo, in addition to his management of the Hassan Arpa School.

Ms. Esti Fairstein, Nationwide instructor in the field of mathematics education in the South and Center Districts for the past 12 years, a nationwide instructor in the Pre-Service Teaching and Entry into Teaching unit handling the matter of assimilation pre-service and new teachers; coordinator of mentoring for new teachers at Kaye College. Her main areas of research are math education in primary school and assimilation of new teachers.

Ms. Fairstein is a doctoral student at Tispol University in Moldova where the topic of her research is "Strategies for Developing the Professional Identity of Pre-Service Teachers through Mentoring Processes."

Mr. Gal Fisher directs the education division at Yad Hanadiv. Previously, he directed the Research and Development Division at Avney Rosha, the Israeli Institute for School Leadership and prior to that, established the Educational Development and Entrepreneurship unit at the Branco Weiss Institute. Mr. Fisher has many years of experience mentoring teachers and principals and leading improvement processes in schools.

Mr. Fisher is a graduate of the Mandel School for Educational Leadership and holds a Master's degree in cultural studies and hermeneutics, received within the framework of the direct to doctorate program of study at Bar-Ilan University.

Dr. Tammy Halamish-Eisenmann, Trump Foundation: Programs and research officer. Since 2009, she has been teaching at the Hebrew University and is among the founders of the MEd Master's program in teaching mathematics at the Jerusalem College. In the past, she taught math at various high schools and is today a lecturer in the School of Education at Hebrew University and at the Jerusalem Teacher Training College. Her post-doctoral research at the Hebrew University of Jerusalem concerned educational technology.

Dr. Halamish-Eisenmann holds a PhD degree in teaching mathematics from the Weizmann Institute of Science.

Dr. Hagit Hartaf, RAMA – Director, Training Division; directed the training division at the National Authority for Measurement and Evaluation in Education since 2006, and coordinates field training on topics of measurement and evaluation for different groups in the education system. In the capacity of her position, she is involved in the professional development of school evaluation coordinators, developing tools and processes for the evaluation of the education system's teaching and administration employees, in developing training materials for principals and in leading the national forum of referents for evaluation.

Dr. Hartaf holds a PhD degree from the University of Haifa, received in 2007.

Mr. Eli Hurvitz, Executive director, Trump Foundation. Among the founders of the [Avney Rosh Institute](#) – the Israel Institute for School Leadership, and of the Nachshon project which helps high school students through online mentoring. He is currently a member of the board of directors of the Center for Scientific Education in Tel Aviv and of the [Hakol Hinuch](#) organization which strives to strengthen public education in Israel. Previously, Hurvitz coordinated the [Committee to Change the Status of the National Library](#), headed by Judge Yitzhak Zamir, and was among the founders of [Guidestar](#), which aims to increase transparency in Israeli non-profit associations. From 2000 to 2011 Hurvitz served as the deputy director of [Yad Hanadiv](#), the Rothschild family's philanthropic foundation in Israel. At the start of his career, he served as the assistant to the chairman of the Knesset's Foreign Affairs and Defense Committee and held various roles as an officer in the Intelligence Division's Central Collection Unit.

Mr. Hurvitz holds an MA degree in Middle Eastern history from Tel Aviv University.

Dr. Ronnie Karsenty, Associate researcher in the Science Teaching Department at the Weizmann Institute of Science and lecturer in several frameworks that train teachers of mathematics. At the Davidson Institute of Science Education, she founded the SHLAV Project for advancing secondary school students with low achievements in mathematics and headed the project for a period of eight years. She currently directs a new project in the Department of Science Teaching that involves videotaping and analyzing math lessons and using them in teacher training. Dr. Karsenty specializes in secondary school students' processes of mathematical thinking, particularly students at risk, in alternative approaches to teaching math to low achievers, in models of support for math teachers' professional development, and in measurement and evaluation of secondary school math achievements.

Dr. Karsenty holds a PhD degree in mathematics education from the Hebrew University in Jerusalem, received in 2002.

Ms. Helena Kimron, RAMA, Director, National Survey Division, one of whose aims is to map routine teaching-learning-evaluation practices in the knowledge area under study. Throughout her career, she has been involved in the professional development of workers holding a range of positions and in the field of evaluation, also using, among other things, an online environment.

Ms. Kimron is studying for her doctoral degree in research and evaluation methods at the School of Education at Tel Aviv University.

Dr. Irma Jan, Ministry of Education, Chief inspector for mathematics (director of the knowledge area). Her main areas of research are gifted children, building probabilistic understanding and reasoning in an experiential and interactive environment.

Dr. Jan holds a PhD degree in teaching sciences and technology from Ben-Gurion University, received in 2011.

Dr. Yaron Lehavi, Senior lecturer at the David Yellin College of Education and employed at the Department of Science Teaching at the Weizmann Institute of Science. At the Institute, among other projects, he is involved in curriculum development and in editing "Impact," the physics teachers' newsletter. In the past, at the David Yellin College, he served as the head of the secondary school teachers training track and currently coordinates curriculum development for the combined Master's degree and teaching certificate program (MTeach). His main areas of interest are teacher training and professional development, teaching physics concepts and the interaction between mathematics and physics.

Dr. Lehavi holds a PhD degree in physics from the Hebrew University.

Ms. Smadar Levi, Doctoral student in the Department of Science Teaching at the Weizmann Institute of Science. She is a teacher and coordinator in the physics track of the Hadarim High School in Hod Hasharon. She is a recipient of the Amos de-Shalit Prize for Excellence in Teaching Physics. Her area of research is physics teachers' professional development through "close to home" learning communities. She guides the physics teachers community in the Sharon area.

Mr. Ron Ofer, Avney Rosh: Media content developer in the development team; director and producer of documentary films for television; teaches documentary film at the Ma'aleh School of Television, Film & the Arts in Jerusalem.

He is a graduate of the Mandel School for Educational Leadership (2006) and of the Sam Spiegel Film and Television School (1995).

Dr. Hannah Pearl, Director of the sciences division at the Ministry of Education's Pedagogic Secretariat; was a chief inspector for mathematics from 2004-2011. In the past, she was a middle school and high school math teacher and instructor. Until 2004, she was a member of the mathematics team at the Hebrew University's Center for Science Teaching, and eventually headed the team. She has co-written courses for the Open University, has edited the newsletter for math teachers for more than 10 years, together with Anna Sfard, and writes textbooks for Hebrew University's Center for Science Teaching.

Dr. Pearl holds a Master's degree in math and a PhD degree in science teaching from the Hebrew University.

Ms. Yael Pulvermacher, Doctoral student in the Department of Education at Ben-Gurion University, lecturer at the Kerem Institute and a mentor for professional development processes of teaching staffs. Her main areas of interest are guiding and mentoring processes for teachers, pre-service and in-service teacher training, development of teaching for comprehension and teaching for comprehension for students with difficulties.

Ms. Pulvermacher holds a Master's degree in special education from the Hebrew University, received in 2003.

Ms. Ofra Ratner-Abrahami, RAMA: Training division manager at the National Authority for Measurement and Evaluation in Education for the past four years. In this capacity, she is involved in professional development for evaluation coordinators at schools, developing processes to assess teaching and administration employees and in developing training materials for principals. She is a member of the Ministry of Education's joint development team.

Ms. Ratner-Abrahami holds a Master's degree in research and evaluation methods from the School of Education at Tel Aviv University, received in 1991.

Dr. Daphna Raviv, Principal of the Virtual High School at the Center for Educational Technology and teaches at Ashkelon Academic College in the Department of Technology and Education. Her main areas of involvement and experience are directing large-scale system programs for distance learning, developing and running synchronous and asynchronous courses for large groups of students and teachers in the education system in general, and in the sciences, in particular, training principals and teachers to integrate internet technologies into teaching, learning and assessment processes, learning and assessment, deep familiarity with synchronous and asynchronous LMS-based technology systems, and working with local authorities and primary and secondary schools on system-wide programs of a laptop for every student and integrating interactive technologies in routine teaching.

Dr. Raviv holds a PhD degree in immunology from Tel Aviv University, received in 1996.

David Rosenberg, of the Content Development and Pedagogy unit of the Moshinsky Institute at ORT Israel. From 2007 to 2011, he coordinated all the training and development activities for guides at the Science Museum in Jerusalem. His main areas of development are ICT tools for a scientific-technological project and matriculation training sites for the core subjects including mathematics. His main area of research in science and technology studies in Israel and Europe.

Mr. Rosenberg holds and MA degree in European Studies from the Hebrew University of Jerusalem, received in 2011.

Ms. Lili Russo, Responsible, developing teacher-educators policy for the Ministry of Education's Professional Development of Educators division. She developed the policy for formal arrangements with the third sector, business community and the Ministry of Education. In her work in the Experiments and Entrepreneurship division at the Ministry, she was responsible for the experimental tracks in the teacher training colleges, responsible for the National Principals Club and responsible for Centers to Disseminate Innovative Knowledge in Education. Within the framework of an experiment, she developed the bio-medical program for the matriculation.

Ms. Russo is studying for her PhD degree in education at Bar-Ilan University.

Dr. Rafa Safadi, Senior lecturer at the Arab College of Education in Israel, located in Haifa, head of the college's Research and Evaluation Authority, scientific advisor and visiting scientist in the Department of Science Teaching at the Weizmann Institute of Science. He has served as the head of the college's Faculty for Physics Teaching and is a member of the Inter-College Research Committee at the MOFET Institute. His main areas of interest and

research are teaching physics, physics teachers' training and professional development and excellence in teaching.

Dr. Safadi holds a PhD degree in physics from the Technion, received in 1991.

Yoav Salamon, director of R&D at the Branco Weiss Institute. His main areas of interest are pedagogical development, particularly aspects of thinking and understanding in teaching and learning, teachers' professional development in the context of teaching and learning for understanding, guiding professional development for teachers and other professionals in the education system, developing effective programs and models for teachers' professional pedagogic development, dissemination and implementation of pedagogical changes in the education system.

Mr. Eli Shalev, Physics teacher at the Hebrew University High School; responsible for advocacy at the Davidson Institute for Science Education in Rehovot.

Mr. Shalev holds a Master's degree in physical chemistry from Tel Aviv University, received in 1990 and a Master's degree in public policy from Hebrew University, received in 2008.

Dr. Hany Shilton, RAMA: director of the formative evaluation area, in which she has been involved for about 20 years. During the past five years, she has been directing RAMA's formative evaluation area. In this capacity, she is responsible for developing and implementing tools for schools to use in formative assessment. She was also involved in the TALIS project – Teaching and Learning International Survey. She has also been involved in the professional development of principals, in teacher training and professional development. Likewise, she has integrated change processes in schools in the area of evaluation.

Dr. Shilton holds a PhD degree in research, measurement and assessment methods in education from Tel Aviv University.

Dr. Dorit Taitelbaum, Ministry of Education, Pedagogic Secretariat, chief inspector for chemistry. Her main areas of activity are coordination of chemistry instruction and supervision of its instruction, following methods for teaching chemistry by conducting observations, tests and exams, examining the level of study and students' achievements, developing teaching methods for chemistry, including integration of thinking skills and learning through research, participation in curriculum planning and implementing the curricula in the system, guiding district instructors and teachers and initiating in-service education for teachers and instructors. She was formerly a teacher and coordinator of the chemistry area at the Shimon Ben-Tzvi School in Givatayim as well as a nationwide instructor for chemistry, particularly on the topic of teaching higher-order strategic thinking.

Dr. Taitelbaum holds a PhD degree in science teaching from the Weizmann Institute of Science, received in 2009.

Ms. Anna Vaknin, Directs the mathematics area at the Amal school network and is involved in guiding teachers, leading in-service education and development of learning materials at all levels of study in preparation for the matriculation exams. She also teaches college preparatory classes at the Interdisciplinary Center – Herzliya.

Ms. Vaknin holds a Bachelor's degree in mathematics and computer science from Ben-Gurion University of the Negev, received in 1988.

Ms. Odelia Vardi, Head of professional development division at the Branco Weiss Institute. For the past 12 years, Ms. Vardi has been involved in coaching teachers, school officials, principals and teacher mentors in various pedagogic programs whose aim is improving teaching and shaping school pedagogic leadership. During the past year she has been coaching teachers in the CLASSMTP program developed by Prof. Pianta at the University of Virginia.

Ms. Vardi holds a Bachelor's degree in teaching mathematics and computers from the Technion, a Master's degree in curriculum from Lesley University in Boston, and as part of her doctoral studies at New York University, is investigating the relationship between teachers' videotaping of their own lessons to the development of their reflective space.

Ms. Irit Wolfgor, Research and development group at the Branco Weiss Institute, head of the video team. Her main areas of research are models for pedagogic literacy and principals of optimal teaching, an interpretation-based change model for teachers' pedagogic development using video-recorded lessons, a model for school pedagogic change, writing-based pedagogy, phenomenology and hermeneutics.

Ms. Wolfgor is studying for her doctorate in Interpretation Studies, in the Interdisciplinary Studies Department at Bar-Ilan University.

Guest lecturers

Mark Atkinson, Mark Atkinson is the Founder of Teachscape, Inc., the leading provider of web-based solutions for enhancing the effectiveness of K-12 teachers. For eleven years, following Teachscape's inception in 1999, Mr. Atkinson served as the company's Chief Executive Officer. Mr. Atkinson has also served as an advisor to the Bill & Melinda Gates Foundation's Measures of Effective Teaching Project. Mr. Atkinson also advises federal, state and local policy-makers on new approaches to teacher evaluation and licensure. Mr. Atkinson has served on the Boards of Trustees of the Oracle Education Foundation, the Breakthrough Collaborative, and is a current Director of Presence Learning, Inc., the country's leading provider of on-line speech therapy services, and The Achievement Network, a Boston-based, education non-profit organization focused on improving the learning outcomes of K-12 students. Prior to founding Teachscape, Mr. Atkinson was the Senior Producer and Manager of New Markets for CBS News Productions in New York City and before that he served as a Producer for Peter Jennings Reporting, ABC News, where he produced a series of Emmy award winning network specials on U.S. foreign policy in Bosnia, Haiti and Iraq. He is a recipient of the Alfred I. DuPont Columbia University "Gold Baton" for his work in Bosnia, considered the industry's most prestigious honor. Mr. Atkinson is a graduate of Yale University.

Charlotte Danielson, a former economist, is an internationally-recognized expert in the area of teacher effectiveness, specializing in the design of teacher evaluation systems that, while ensuring teacher quality, also promote professional learning. She advises State Education

Departments and National Ministries and Departments of Education, both in the United States and overseas. She is in demand as a keynote speaker at national and international conferences, and as a policy consultant to legislatures and administrative bodies.

Ms. Danielson's many publications range from defining good teaching ("Enhancing Professional Practice: a framework for teaching," 2007), to organizing schools for student success ("Enhancing Student Achievement: a framework for school improvement," 2002), to teacher leadership ("Teacher Leadership that Strengthens the Profession," 2006), to professional conversations ("Talk about Teaching! Conducting Professional Conversations," 2009), to numerous practical instruments and training programs (both onsite and online) to assist practitioners in implementing her ideas.

Ms Danielson is a graduate of Cornell University (history), Oxford University (philosophy, politics, and economics) and Rutgers University (educational administration and supervision). She has taught at all levels (kindergarten through university) and has worked as a curriculum director and staff development director, and is the founder of The Danielson Group. Her Framework for Teaching has become the most widely-used definition of teaching in the United States, and has been adopted as the single model, or one of several approved models, in over 20 states.

Prof. Michal Beller, executive director of the National Authority for Measurement and Evaluation in Education (known as RAMA in its Hebrew acronym). Established in 2005, Prof Beller is RAMA's founding director. Her academic training is in the field of psychology and her main area of expertise is educational measurement and evaluation.

For several years, until she assumed the role of executive director at RAMA, she was senior research director in the R&D department at Educational Testing Service (ETS), the largest testing institute in the world, located in Princeton, New Jersey. Prof. Beller headed the National Institute for Testing and Evaluation (established by the universities in Israel) for a period of eight years. Previously, she was an associate professor in the Education and Psychology Department at the Open University where she also established and directed the Shaham Center (Hebrew acronym for Integrating Technologies in Learning).

Prof. Beller has published many articles in the field of educational measurement and evaluation, participated in many international conferences where she represented Israel, and serves as a member of professional steering committees in Israel and abroad.

She holds a PhD from the Department of Psychology at the Hebrew University of Jerusalem, received in 1983.

Ayelet Levin-Schnur, expert in the field of communications at the Hebrew University High School and main teacher of a mainstreamed special education class for students with communication disorders at the Braunschweig Masorti High School in Jerusalem. Trained as teacher of literature, English and special education, Ms. Levin-Schnur has been involved in education and teaching for 14 years. She is also involved in curriculum development in the areas of self-awareness, sex education, and social integration.

Ms. Levin-Schnur holds an MA in general and comparative literature from the Hebrew University of Jerusalem, received in 2013.

Moti Rosner, director of Division A for Professional Development of Teaching Professionals, director of the Jewish-Zionist Education institutes, served as an emissary in London and Los Angeles of the Jewish Agency's Youth and Pioneer Department and served as the deputy director of the Administration for Value-based Education at the Ministry of Education. Mr. Rosner holds an MA degree in education from the Hebrew University of Jerusalem.

Gali Shimoni, had for close to two decades, taught mathematics at middle schools and at secondary schools in Israel. He previously taught math in the Former Soviet Union. He was awarded the Technion's Avital Prize for his outstanding contribution to mathematical education. Mr. Shimoni created, together with Zvi Shalem, the card game called "Swish," which was sold to "ThinkFun," an American company. During the past ten years, he has authored or co-authored study materials for mathematics for the "Excellence 2000" project. Mr. Shimoni heads the Mathematics Department at the Israel Center for Excellence through Education.

Mr. Shimoni holds a BSc in mathematics and statistics and an MA in science education – both from the Hebrew University of Jerusalem.