# Chapter 10
# Teachers Editing Textbooks: Transforming Conventional Connections Among Teachers, Textbook Authors, and Mathematicians

**Ruhama Even, Michal Ayalon, and Shai Olsher**

## Introduction

Jill Adler began her academic work at a time when research in mathematics education mainly focused on studying the individual student's cognition and knowledge, and development work was mainly associated with curriculum development. Recognizing the shortcomings of this narrow focus for improving mathematics education, Jill was a leading driving force in advancing the field of mathematics education by expanding inquiry to include aspects related to mathematics teachers and teaching, as well as incorporating a sociocultural approach to research in mathematics education, in order to capture, rather than eliminate, the complexity of classroom teaching and learning, and of the professional development of mathematics teachers.

Shared interest and commitment to research and development work in the area of the professional development of mathematics teachers, and in incorporating a sociocultural perspective to this work, created opportunities for Jill Adler and Ruhama Even (the first author of this chapter) to interact at an international level during the last two decades. Like her writing (e.g., Adler & Lerman, 2003; Adler & Ronda, 2014), these interactions reflected Jill's deep respect and concern for teachers, her strong commitment to making a contribution to the community in which her research is situated, attending to policy and institutional context.

Acknowledging the need for research studies that are concerned with textbook use (e.g., Fan, Zhu, & Miao, 2013), and troubled by the small number of such

R. Even (✉) • M. Ayalon
Department of Science Teaching, Weizmann Institute of Science, Rehovot 76100, Israel
e-mail: Ruhama.even@weizmann.ac.il; Michal.ayalon@weizmann.ac.il

S. Olsher
Faculty of Education, University of Haifa, Haifa, Israel
e-mail: olshers@edu.haifa.ac.il



M. Phakeng, S. Lerman (eds.), *Mathematics Education in a Context of Inequity, Poverty and Language Diversity*, DOI 10.1007/978-3-319-38824-3_10

studies in South Africa—a country in which the textbook is highly regarded as a useful and important resource for teaching and learning—a current focus of Jill's work is teachers' use of textbooks. Together with her doctoral student Moneoang Leshota, they investigate the relationship between the affordances of a textbook, and teachers' pedagogical design capacity in the mediation of the object of learning in the classroom. As part of the wider study, Leshota and Adler (2014) investigate teachers' mobilization of the textbook, demonstrating that the insertions and omissions that teachers make in the textbook play an important role in the kind of mediation of the object of learning that takes place in the classroom.

> While *impotent omissions* do not harm the object of learning, *critical omissions* on the other hand detract from the object of learning and therefore affect the end result of mediation. With respect to insertions, *distractive insertions* have been shown to have potential for being harmful to the object of learning, as they may lead to erroneous mediation; thus, if insertions to the content have to be made, they should be *robust insertions* which serve to enhance the object of learning (p. 295).

The *M-TET* (*Mathematics Teachers Edit Textbooks*) project[1] in Israel also acknowledges the importance of attending to teachers' mobilization of the textbook. But in contrast to Leshota and Adler that analyze it, teachers' mobilization of the textbook is used by us as a point of departure for examining how the conventional connections among teachers, curriculum developers, and mathematicians could be transformed into more productive ones, while contributing to teachers' professional development and to building a professional community of teachers. The M-TET project attempts to do so by inviting mathematics teachers to collaborate in editing the textbooks they use in their class in a work environment that is characterized by aspects that are usually not part of teachers' practice. These include designing a textbook for a broad student population instead of focusing on the specific student population taught, producing a textbook by making changes in a textbook designed by expert curriculum developers, and consulting with professionals who are not part of the teachers' usual milieu: mathematicians and curriculum developers.

This chapter presents the rationale underlying the M-TET project; it describes the unusual work environment offered to participants, and explores the nature of the connections of the participating teachers with a textbook author and a mathematician that participation in the project made possible. Finally, it discusses what could be gained by offering such a work environment.

[1] The M-TET project is part of the Rothschild-Weizmann Program for Excellence in Science Teaching, supported in part by the Caesarea Edmond Benjamin de Rothschild Foundation.

## Teachers, Curriculum Developers, and Mathematicians

Conventional connections between mathematics teachers and curriculum developers are limited and mainly unidirectional—originating from curriculum developers and proceeding to teachers. The prevalent views and assumptions about the teacher's role commonly regard mathematics teachers as curriculum enactors and users of curriculum materials (e.g., textbooks) furnished by expert curriculum developers. In contrast to their central role in enacting the curriculum and in using textbooks, teachers usually play a rather insignificant role in developing textbooks. Indeed, some textbook authors are also teachers, and as part of the process of curriculum development, selected teachers are often recruited by curriculum developers to teach an experimental version of a new curriculum program in order to gather information about how students deal with the tasks posed, to estimate the time needed to work on tasks in class, and to construct a conjectured learning trajectory (e.g., Clements, 2002; Hershkowitz et al., 2002). Still, obviously, only a small number of selected teachers can actually participate in developing textbooks in the ways described.

This view of the teachers' role as enactors of the curriculum and users of curriculum materials is also reflected in research on the relationships between teachers and textbooks, which typically focuses on how textbooks influence classroom instruction and how teachers use curriculum materials (e.g., Eisenmann & Even, 2011; Haggarty & Pepin, 2002; Remillard, Herbel-Eisenmann, & Lloyd, 2009; Stein, Remillard, & Smith, 2007; Thompson & Senk, 2014). Consequently, the voice of the vast majority of teachers remains unheard and most teachers rarely influence textbook design and development. Teachers' aspirations about desired textbooks and adjustments that they make in textbooks—based on their experiences, knowledge, and beliefs about mathematics and its teaching and learning, as well as their acquaintance with the system in which they teach and with their own students—often remain unknown to curriculum developers and to the community of mathematics educators at large.

Conventional connections between teachers and university mathematicians are also limited. They occur mainly during the teacher preparation stage, when prospective teachers study advanced mathematics in courses taught by university mathematicians. However, teachers rarely have opportunities to consult with mathematicians about the mathematics they teach in class during their teaching career. Professional development courses and workshops for practicing mathematics teachers are usually designed and conducted by mathematics educators, and not by university professors whose main activity is mathematical research (of course there are a few exceptions).

Moreover, school teachers rarely initiate and lead interactions with mathematicians and textbook authors; interactions in which the teachers make decisions about the content, timing, and format of the interactions, as is illustrated in numerous publications dealing with the professional education of mathematics teachers (e.g., Even & Ball, 2009). Usually it is non-teachers (e.g., teacher educators, supervisors, policy makers) who initiate and lead such activities, and they are the ones who make decisions regarding the content and format of the connections of teachers with mathematicians and with curriculum developers.

The M-TET project examines how the conventional connections among teachers, curriculum developers, and mathematicians might be transformed into connections that are more productive. Below we first present a general description of the project. Then we demonstrate the nature of the connections of the participating teachers with a textbook author and a mathematician that the M-TET work environment made possible.

## General Description of the M-TET Project

### *Background*

As a country with a centralized educational system, the Israeli school curriculum is developed and regulated by the Ministry of Education. Like in South Africa, in Israel the textbook is also highly regarded as a useful and even a central resource for teaching and learning. In 2009 the Ministry of Education launched a new national junior-high school mathematics curriculum (Ministry of Education, 2009). The new national curriculum emphasizes problem solving, thinking, and reasoning for all students as well as connections among mathematical concepts, topics, and domains. In response to the introduction of the new curriculum, the mathematics group in the Department of Science Teaching at the Weizmann Institute of Science began developing a new comprehensive junior-high school mathematics curriculum program entitled *Integrated Mathematics* (*Matematica Meshulevet*). The textbooks are developed in regular/extended and limited scope versions. The *Integrated Mathematics* textbooks are used in more than 250 schools throughout Israel.

The M-TET project, now in its sixth year, uses the *Integrated Mathematics* textbooks as a point of departure. During the first 3 years of the project (2010/2011–2012/2013 school years), teachers were invited to collaborate in editing the textbooks they use in their classes and to produce, as a group product, revised versions of those textbooks that would be suitable for a broad student population. A mathematician, the textbook authors, and researchers in mathematics education were made available to the participating teachers for consultation during the editing process. The activity in the last 3 years (2013/2014–2015/2016 school years) shifted to teachers' collaborative editing of the teacher guides for the textbooks used in their classes, maintaining a similar work environment. This chapter focuses on the first 3 years of the M-TET project, when groups of teachers collaborated in editing textbooks. The first author is the head of both the *Integrated Mathematics* project and the M-TET project; the other two authors are leading team members of the M-TET project.

## *Project Objectives*

The main objective of the M-TET project is to examine how the conventional connections among teachers, curriculum developers, and mathematicians could be transformed into ones that are more productive, while contributing to teacher's professional development and to building a professional community of teachers.

## *Project Operation*

Teacher's participation in the M-TET project consists of the following: (1) ongoing distance work and (2) monthly face-to-face whole-group meetings. During the first 3 years of operation, the ongoing distance work included textbook editing of various types (e.g., adding tasks, changing the phrasing or the order of the textbook tasks), reacting to other participants' suggestions (e.g., supporting, opposing, debating, and elaborating), and discussing mathematical and pedagogical issues (e.g., what approach is suitable for students with difficulties). The monthly whole-group face-to-face meetings were built on the preceding teachers' distance work of textbook editing, and these meetings also served as departing points for subsequent distance work. They consisted of collaborative work on textbook editing, instruction on the technological tool used in the project (e.g., editing, reacting, viewing the change history), discussions of mathematical and pedagogical issues (e.g., the role of technological tools in mathematics lessons), and discussions of community working norms (e.g., the issue of amending another teacher's editing suggestion).

To enable collaborative textbook editing and the production of a joint revised textbook, we used, with some modifications, the MediaWiki platform and Wikibook templates for constructing the project's website. This website serves as an online platform for collaborative work on a common database (i.e., a textbook) and for discussions in a forum-like fashion (for more information on the technological platform used in the M-TET project, see Even and Olsher, 2014).

Participating teachers were provided with two kinds of support that accompanied both the distance work and the face-to-face meetings. One was technical support in using the technological platform for textbook editing. The aim of this support was to provide a smooth, efficiently running work environment that enables teachers to perform the desired editing without having to deal with, or be constrained by, technological difficulties. The other kind of support was related to conceptual issues that emerged as part of the editing work. To this end, the participating teachers were offered an opportunity to consult with various professionals throughout their ongoing distance work and during their monthly face-to-face meetings. The professionals made available for consultation included the authors of the *Integrated Mathematics* textbooks, a research mathematician, and researchers in the field of mathematics education.

During the first year, the project team purposely avoided any intervention with, commenting on, or evaluation of the teachers' work, besides instructing the teachers on how to use the project website. The role of the project team during that year was to ensure a smooth running work environment and to moderate, but not direct, the monthly face-to-face meetings. Similarly, during that year, the consultants associated with the project were explicitly instructed not to initiate any intervention with, comment on, or evaluate the teachers' work. Instead, the consultants were instructed to respond only when explicitly approached by the teachers, and to address only queries related to the following areas: the reasons for specific choices made in the textbook by the textbook authors, the mathematics in the curriculum, and research in mathematics education. Findings from a study that examined the changes that the first-year participants in the project suggested to make in the seventh grade textbook they were using were reported in Olsher and Even (2014).

From the second year onwards, the participating teachers continued to receive an autonomous work environment wherein they could freely edit the textbooks as they wished. However, the consultants associated with the project were allowed to freely comment on the teachers' editing suggestions and could freely address any query raised by the teachers. In addition, a sizable part of the monthly face-to-face meetings was devoted to discussions with the textbook authors and with the mathematician on issues chosen by the teachers and by the project team. Next, we will use the editing work on a unit of the Pythagorean Theorem that took place during the second year of the project to exemplify the nature of the teachers' connections with a textbook author and a mathematician that the M-TET work environment made possible.

## Editing a Unit on the Pythagorean Theorem

During the second year of the project the 20 participating teachers worked on editing two textbooks from the *Integrated Mathematics* curriculum program; both textbooks were intended for eighth grade: a regular/extended textbook (Buhadanah et al., 2011a) and a limited scope textbook (Buhadanah et al., 2011b). These textbooks, which basically covered the same mathematics topics, were approved by the Ministry of Education for students in the upper two-thirds and lower one-third achievement levels, respectively. The teachers worked in two (occasionally overlapping) small groups: one group focused on editing the regular/extended textbook, and the other on editing the limited scope textbook. During the face-to-face monthly meetings the whole group discussed the editing proposals and dilemmas encountered by each small group.

The teachers devoted a considerable amount of time during that year to editing a unit on the Pythagorean Theorem in the limited scope textbook: about 6 weeks of distance work and two face-to-face whole-group meetings. Next, we will first present the textbook approach, and then the main stages of the editing work, highlighting the connections among the teachers, the unit author, and the mathematician, which were made available for consultation.

## *The Textbook Approach*

The Pythagorean Theorem comprised seven lessons in the textbook, a total of 46 pages. The first two lessons in the textbook were the focus of most of the teachers' editing work. In the first lesson in the textbook the students were requested to find the lengths of the sides of several right triangles by measuring them, then to organize their results in a table, and finally, to determine whether a hypothetical student's (false) claim about the connections between the lengths of the sides is true (see Fig. 10.1). (The text in this, as well as in all other figures, is a translation to English of the original Hebrew text.)

The textbook then presented a claim of another student—this time it was the Pythagorean Theorem (i.e., in a right triangle the sum of the areas of the squares built on the legs equals the area of the square built on the hypotenuse)—and asked students to determine whether it was true in several cases. The lesson concluded by explicitly stating the Pythagorean Theorem, followed by tasks intended for student work.

The second lesson in the textbook began with a reminder of the connection between the sides of right triangles found in the previous lesson (i.e., the Pythagorean Theorem), stating, "We will check, using additional examples, whether this claim is indeed true" (see Fig. 10.2).

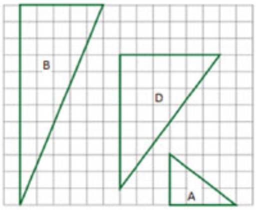
## *The Teachers' Initial Approach*

A lively discussion developed among the teachers concerning two central issues regarding the way the textbook introduced the Pythagorean Theorem. The first issue dealt with the decision to begin the teaching of the Pythagorean Theorem with a false statement (Udi's claim in Fig. 10.1). Two contrasting approaches were raised: Some of the teachers wanted to revise the textbook, driven by the concern that the false statement would be adopted by the students. Instead, they suggested to start by correctly phrasing the Pythagorean Theorem, and only later asking students to examine relationships, like the one Udi suggested in Fig. 10.1, which are true for some, but not for all right triangles. In this way, those teachers argued, students would appreciate the beauty of the Pythagorean Theorem, which is always true. Other teachers supported the textbook's approach, and argued that one way of dealing with students' mistakes is to purposely start by examining a false statement that appears to be true.

The second issue that the teachers discussed was that the textbook first stressed the idea that making a generalization, based only on checking a few cases, might

**Connections between the lengths of the legs and the length of the hypotenuse**

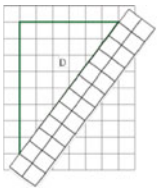
2. a. In the following table the lengths of the sides of one triangle (C) are given and the lengths of the sides of the drawn triangles (A, B, D) are missing.




Use the squares to complete in the table the lengths of the legs of the three triangles.

| Triangle | Short leg a | Long leg b | Hypotenuse c |
|---|---|---|---|
| **A** | | | |
| **B** | | | |
| **C** | 7 | 24 | 25 |
| **D** | | | |

b. Use the squares to complete in the table the length of the hypotenuse of each triangle. (The length of the hypotenuse of a triangle can be measured by placing a graph paper alongside the hypotenuse and counting the squares. See the figure.)



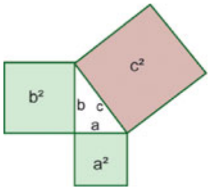

c. Udi observed the table and said: "If we multiply the length of the short leg by itself, we will get the sum of the long leg and the hypotenuse" ($a \cdot a = b + c$). Is Udi right?

**Fig. 10.1** Excerpt from the first textbook lesson on the Pythagorean Theorem (Buhadanah et al., 2011b, p. 236)

lead to wrong conclusions (Udi's claim in Fig. 10.1). However, the textbook later justified the Pythagorean Theorem by relying only on a few examples and even explicitly suggested it as a legitimate means of checking whether a claim is true (see Fig. 10.2): "We will check, using additional examples, whether this claim is indeed true" (Buhadanah et al., 2011b, p. 243). The teachers felt that the textbook approach was problematic but were not sure how to go about resolving it.

In the previous lesson we found a connection between the areas of squares built on the sides of a right triangle. The sum of the areas of the squares built on the legs equals the area of the square built on the hypotenuse.

$$a^2 + b^2 = c^2$$




a and b are the lengths of the legs, c is the length of the hypotenuse.

We will check, using additional examples, whether this claim is indeed true.

**Fig. 10.2** Excerpt from the second textbook lesson on the Pythagorean Theorem (Buhadanah et al., 2011b, p. 243)

## *Consulting with the Textbook Author*

The teachers decided to consult with the author of the textbook unit on the Pythagorean Theorem—one of the co-authors of the textbook—and she was invited to the following face-to-face monthly meeting. When meeting with her, the teachers first presented their contrasting approaches regarding beginning the lesson on the Pythagorean Theorem with a false statement. The author responded by explaining her view on the potential of such an introduction to create a feeling of surprise that the Pythagorean Theorem is true, and the need to find a way to prove it. Below is an excerpt from the discussion:

Teacher A: I'm afraid that the error [the erroneous formula] will stick with the students.

Teacher B: Why? . . . We need to put the mistakes on the table. This is overwhelming. It creates a conflict. It requires them to use critical thinking.

Teacher C: It's not good to start a new topic with a mistake. I think that we need to change this.

. . .

Teacher A: It is similar to the Pythagorean formula and it's confusing.

Author: The idea is to illustrate that you can't depend on examples in order to generalize and to reach conclusions. The Pythagorean Theorem is a surprising theorem. However, it won't be surprising if we just introduce it in class. Therefore, this is a golden opportunity to encourage students to evaluate another formula that works in some cases and suddenly does not work, and to build up the need for a different sort of justification, not generalization from examples.

Teacher C: I agree. This is a wonderful opportunity.

The conversation then moved to the second issue. The teachers suggested adding a proof to the Pythagorean Theorem. This suggestion gained the author's support:

Teacher D: I still have a problem. The goal is to prevent reaching conclusions from examples. We are showing them first that it's prohibited and then that it's okay. What are we really showing them?

Teacher E: Why, then, isn't a proof added, even a visual one?

Teacher F: Good. I have an actual proof.

. . .

Author: Concerning what you said (turning to Teacher D), you're right. . .. I think we should include a proof. . .. Perhaps if we revise the textbook we will include a proof—maybe the visual side of the proof in order to justify why the theorem is true.

## *The Teachers' Intermediate Approach*

Following this conversation, the teachers decided to leave the introduction to the topic as is, and to add a proof for the Pythagorean Theorem. They decided to adopt the proof that appeared in the regular/extended textbook (Buhadanah et al., 2011a) that is based on a visual demonstration (as in Fig. 10.3) accompanied by a full deductive proof based on triangle congruence. However, the teachers found it difficult to decide whether a full deductive proof would fit the current learning stage of students in the lower one-third achievement level or whether an informal visual demonstration would better suit these students, and whether a visual demonstration could be considered as proof at all.

## *Consulting with a Mathematician*

The teachers decided to consult with the mathematician made available for consultation. They met with him and presented their thoughts about adding a proof to the Pythagorean Theorem. The mathematician supported the teachers' suggestion:

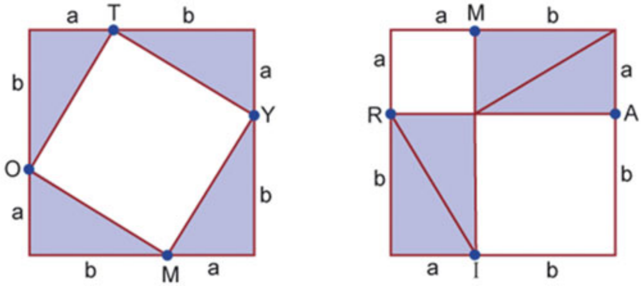



**Fig. 10.3** Visual proof of the Pythagorean Theorem suggested by the teachers (adapted from Buhadanah et al., 2011a, p. 241)

"More and more examples do not convince or prove... It is against mathematical thinking."

He then expanded his response and shared with the teachers the role of proof in his own everyday mathematical work:

> How do I work, how do real mathematicians solve problems: we do not think in terms of theorems. As mathematicians, when we develop a mathematical theory, we do not think using axioms. We look at several examples and look for a pattern. Once I see the pattern, then I have a feeling that maybe I can develop a theorem. Then I have to find a proof, a general proof. I can no longer base things on examples. This is against mathematical thinking.

The mathematician emphasized the importance of coherently building the idea of proving in mathematics, beginning already at this stage, also for students with low achievements. Yet, he added that he leaves the decision about whether to add a proof, and which kind, to the teachers, who are "experts on pedagogy." However, if the teachers decide not to add a proof or to add a partial proof, he strongly recommended adding a comment in the textbook indicating that a complete proof will be presented in the future.

## *The Teachers' Final Decision*

Eventually, the teachers added to the textbook that they edited the full deductive proof based on triangle congruence that appeared in the regular/extended textbook, and a link to an applet that makes the Pythagorean Theorem more tangible (by dragging the squares) directed at classes where the presentation of a proof was not appropriate.

## *The Author's Revision of the Textbook*

Later, when preparing a revised version of the textbook, the author of the unit on the Pythagorean Theorem added a proof of the Theorem, as the teachers had suggested. However, after negotiating with the Ministry of Education during the long process of having the textbook approved for use in class—the introductory part of the unit on the Pythagorean Theorem was completely changed. The new version of the textbook includes a more straightforward presentation of the Pythagorean Theorem and its illustrations; in particular, the beginning of the lesson and the proof were omitted in the revised version.

## Discussion

Leshota and Adler's (2014) study points to the important role that the insertions and omissions that teachers make in the textbook play in the kind of mediation of the object of learning that takes place in the classroom. The M-TET project enables the insertions, omissions, and other changes that teachers make in the textbook to become the object of learning for teachers in a work environment characterized by aspects that are usually not part of teachers' practice. These include designing a textbook for a broad student population instead of focusing on the specific student population taught, producing a textbook by making changes in a textbook designed by expert curriculum developers, and consulting with professionals who are not part of the teachers' usual milieu: mathematicians and curriculum developers. As was illustrated in the Pythagorean Theorem case, the unique work environment of the M-TET project created an authentic setting for establishing novel connections between teachers and textbook authors, and between teachers and a mathematician.

Working with colleagues in designing a textbook for a broad student population facilitated the development, clarification, and articulation of shared ideas regarding the teaching of mathematics, which could then be confidently presented and discussed with the textbook authors and mathematicians. This includes, for example, whether textbooks should present false claims (e.g., Udi's claim in Fig. 10.1) and whether proofs are needed in textbooks for students with low achievements. Being well thought of by a group of teachers the teachers' questions, ideas, and proposals were worth listening to, thinking about, and responding to, by the textbook author and a mathematician.

Moreover, as demonstrated in the case of the Pythagorean Theorem, in contrast to common practice, in the M-TET work environment, interactions among teachers, textbook authors, and mathematicians were initiated by the teachers themselves, who were also the ones who determined the content, timing, and format of these interactions, based on their needs and goals. For example, the textbook author of the unit on the Pythagorean Theorem was invited by the teachers to meet with them when, as a group, they could not reach an agreement regarding the beginning of the lesson on the Pythagorean Theorem. Similarly, when hesitating which proof would better fit students with low achievements, and whether a visual demonstration is really a mathematical proof, the mathematician was consulted.

Such connections with textbook authors and mathematicians were well appreciated by the teachers. This is illustrated in the following statement made by one of the teachers who also revealed how the interactions—which she termed collaborations—with the textbook authors and the mathematician contributed to her classroom teaching:

> The talks, the collaboration with the authors and the mathematician, there are not such things anywhere. It makes me feel important that they want to listen to me and to work with me. They talk to me eye-to-eye… It changed the way I see myself and the way I use the curriculum in class. I now ask myself: What is the aim of this task? What would the author say about this part of the lesson? Is the mathematical concept in this lesson used correctly?

The shortcomings of conventional connections between teachers and textbook authors, and those between mathematics teachers and mathematicians are of a different nature, as are the strengths of the transformed connections made possible by the M-TET work environment. Conventional connections between mathematics teachers and textbook authors usually occur via teaching materials written by curriculum developers (e.g., textbooks and teacher guides), and when curriculum developers conduct workshops for teachers aimed at improving the implementation of the curriculum program they develop. In such situations, textbook authors become "teachers" and teachers become "students" whose role is to learn from the experts. The M-TET work environment facilitates interactions in which the teachers and textbook authors have more equal positions and authority. As in traditional interactions, in the M-TET work environment the teachers have opportunities to learn from the textbook authors about their intentions and ideas (e.g., the issue of false claims). However, such learning occurs on the teachers' terms. Moreover, teachers have opportunities to deliberate with textbook authors' ideas and principles related to the teaching of mathematics, to be heard by textbook authors, and to influence textbook design (e.g., a missing proof).

The shortcomings and strengths related to the conventional and transformed (respectively) connections between teachers and mathematicians differ from those of the teachers and textbook authors portrayed above. The Conventional connections between mathematics teachers and university mathematicians usually occur only during the teacher preparation stage. Practicing teachers rarely have opportunities to consult with mathematicians about the mathematics they teach in class. The M-TET work environment provides such opportunities for practicing teachers, again, on the teachers' terms. The M-TET work environment facilitates interactions in which teachers and research mathematicians discuss issues that are of interest to the teachers and are authentic to their teaching practice (e.g., aspects of mathematical proofs). Teachers are provided with opportunities to increase their confidence (e.g., the essential role of proofs), and to improve their understanding of what mathematics actually is by hearing first hand from an active research mathematician about the nature of the work he engages in as part of his everyday professional life.

As demonstrated here, the unique characteristics of the M-TET work environment provide opportunity to transform the conventional connections of teachers with textbook authors and mathematicians into more productive ones, while contributing to the professional development and building of a professional community of teachers, as one teacher said:

> I feel that I am in a continuous process of growth. The project empowers me, being part of a group who works together on something important… The ability and the motivation to test my intentions all the time, not to surrender to the routine assignments of teaching, but instead, to stop, to analyze the lesson and the tasks, to reflect on the lesson and to consider a change… The interactions with the other teachers and the project team, listening, talking, and sometimes even arguing with other teachers, learning from different people having different opinions—this is all part of me now. It is difficult for me to think of myself, who I was had I not been here.

## References

Adler, J., & Lerman, S. (2003). Getting the description right and making it count: Ethical practice in mathematics education research. In A. J. Bishop, M. A. Clements, C. Keitel, J. Kilpatrick, & F. K. S. Leung (Eds.), *Second international handbook of mathematics education, Part 2* (pp. 441–470). Dordrecht: Kluwer Academic Publishers.

Adler, J., & Ronda, E. (2014). An analytic framework for describing teachers' mathematics discourse in instruction. In *38th Conference of the International Group for the Psychology of Mathematics Education and the 36th Conference of the North American Chapter of the Psychology of Mathematics Education*. Vancouver, Canada.

Buhadanah, R., Friedlander, A., Hadas, N., Kiro, S., Koren, M., Osruso-Hagag, G., et al. (2011a). *Integrated mathematics (Matematica meshulevet): 8th grade—part B (Blue track for levels A and B)*. Rehovot, Israel: The Weizmann Institute (in Hebrew).

Buhadanah, R., Friedlander, A., Hadas, N., Kiro, S., Koren, M., Robinson, N., et al. (2011b). *Integrated Mathematics (Matematica meshulevet): 8th grade—Part B (Green track for levels C and below)*. Rehovot, Israel: The Weizmann Institute (in Hebrew).

Clements, D. H. (2002). Linking research and curriculum development. In L. English (Ed.), *Handbook of international research in mathematics education* (pp. 599–630). Mahwah, NJ: Laurence Erlbaum.

Eisenmann, T., & Even, R. (2011). Enacted types of algebraic activity in different classes taught by the same teacher. *International Journal of Science and Mathematics Education, 9*, 867–891.

Even, R., & Ball, D. L. (Eds.). (2009). *The professional education and development of teachers of mathematics—The 15th ICMI Study*. New York: Springer.

Even, R., & Olsher, S. (2014). Teachers as participants in textbook development: The Integrated Mathematics Wiki-book Project. In L. Yeping & G. Lappan (Eds.), *Mathematics curriculum in school education* (pp. 333–350). New York: Springer.

Fan, L., Zhu, Y., & Miao, Z. (2013). Textbook research in mathematics education: Development status and directions. *ZDM: International Journal on Mathematics Education, 45*(5), 633–646. doi:10.1007/s11858-013-0539-x.

Haggarty, L., & Pepin, B. (2002). An investigation of mathematics textbooks and their use in English, French and German Classrooms: Who gets an opportunity to learn what? *British Educational Research Journal, 28*(4), 567–590.

Hershkowitz, R., Dreyfus, T., Ben-Zvi, D., Friedlander, A., Hadas, N., Resnick, T., et al. (2002). Mathematics curriculum development for computerized environments: A designer-researcher-teacher-learner activity. In L. English (Ed.), *Handbook of international research in mathematics education* (pp. 657–694). Mahwah, NJ: Laurence Erlbaum.

Leshota, M., & Adler, J. (2014). The analysis of teachers' mobilisation of the textbook. In K. Jones, C. Bokhove, G. Howson, & L. Fan (Eds.), *Proceedings of the International Conference on Mathematics Textbook Research and Development (ICMT-2014)* (pp. 291–296). Southampton, GB: University of Southampton.

Ministry of Education. (2009). *Math curriculum for grades 7-9*. Retrieved from http://meyda.education.gov.il/files/Tochniyot_Limudim/Math/Hatab/Mavo.doc (in Hebrew).

Olsher, S., & Even, R. (2014). Teachers editing textbooks: Changes suggested by teachers to the math textbook they use in class. In K. Jones, C. Bokhove, G. Howson, & L. Fan (Eds.), *Proceedings of the International Conference on Mathematics Textbook Research and Development (ICMT-2014)*. Southampton, GB: University of Southampton.

Remillard, J. T., Herbel-Eisenmann, B. A., & Lloyd, G. M. (Eds.). (2009). *Mathematics teachers at work: Connecting curriculum materials and classroom instruction* (pp. 152–170). New York: Routledge.

Stein, M. K., Remillard, J., & Smith, M. S. (2007). How curriculum influences student learning. In F. K. Lester (Ed.), *Second handbook of research on mathematics teaching and learning* (pp. 319–369). Charlotte, NC: Information Age.

Thompson, D. R., & Senk, S. L. (2014). The same geometry textbook does not mean the same classroom enactment. *ZDM: The International Journal on Mathematics Education, 46*(5), 781–795.