**Chapter 3: Substantive Pedagogy and its Role in Deep System-Wide Change Processes**

The desire to enact educational reform that succeeds in making deep changes in the heart of learning and instruction requires a clear explanation of what is meant by a deep change. In order to refine the explanation, I define three pedagogical concepts that allow us to distinguish between different uses of the term “pedagogy”.

**Distinguishing between types of pedagogy: administrative pedagogy, structural pedagogy, and substantive pedagogy**

The root of the word pedagogy comes from ancient Greek. Its literal meaning is to “lead and escort a child”. In ancient Greece, it was customary for the pedagogue (who was usually a slave) to lead his master's son to school, escort him, take care of him, and carry his supplies (Sergiovanni, 1998). Today, pedagogy is used as a general term for educational theories, some of which are more closely related to the emotional and ethical aspects of education, while others are more closely related to the cognitive aspects of teaching. In the Israeli education system, the term is used to refer to vastly different things. For example, one central unit in the Ministry of Education is the Pedagogical Administration (that deals with teachers’ salaries, school budget etc.) and another central unit is the Pedagogical Secretariat (that deals with curriculum). Schools have 'pedagogical coordinators' and 'pedagogical meetings'. In order to distinguish between various uses of the term pedagogy, I shall refer to them as administrative pedagogy, structural pedagogy, and substantive pedagogy (or: pedagogy of the essence of teaching).

**Administrative pedagogy** deals with systemic managerial issues related to teaching and learning, such as organizing the schedule of vacation days, placement of teachers, budgeting ongoing instruction and special programs, or monitoring curriculum implementation. Structural pedagogy refers to activities that organize classroom learning and instruction. These activities include the use of worksheets, students’ independent work, group work, writing papers, and use of technology. Although activities carried out at these two levels may enable deep changes in the cognitive processes that affect students' thinking and understanding, simply enacting them does not necessarily bring about the desired change.

**Substantive Pedagogy** (pedagogy of the essence of teaching)on the other hand, deals with fundamental patterns of learning and instruction. It addresses issues such as: teaching for understanding, achieving change in the way students understand concepts and processes, integrating higher-order thinking into the teaching of content, integrating discussions of social, moral and ethical issues in the teaching of content, using metacognition, and adopting assessment processes that examine students' abilities to think critically and transfer ideas to new contexts. Serious work addressing such issues has a potential to improve students’ deep understanding and thinking. Therefore, substantive pedagogy can facilitate a profound change in the quality of teaching and learning and in the profile of school graduates.

Although Elmore (2004) did not use the term substantive pedagogy, his writings on educational change processes (discussed in the previous chapter) reflect a similar idea. Elmore argues that the heart of educational practice consists of teachers' perceptions of the nature of knowledge, students' role in learning, and how teaching and learning processes are expressed in the classroom. He notes that education includes many additional valuable aspects. Yet, according to Elmore, if an educational process does not involve classroom interactions between teacher and students in the presence of content, it will not touch upon anything substantive (Elmore, 2004). Elmore’s ideas are close to the ideas involved in the concept of substantive pedagogy defined here. Similarly, Spillane (2000) does not use the specific terms defined in this chapter, yet expresses a similar idea using the terms 'form' and 'function' (see details on page X).

Is it necessarily a change in substantive pedagogy that will bring about the desired improvement in the overall quality of the education system as a whole, or that of an individual school? We will try to answer this question in a number of ways. First, on an intuitive level, it is reasonable to argue that if most reforms focus on peripheral issues rather than on the substantive nature of instruction, then it is no wonder that the essence/substance does not change. If we aim to influence the quality of learning and instruction, we need to invest direct effort in this particular dimension of education rather than in dimensions that are only indirectly related to it.

Second, a series of diverse studies indicate that the greatest impact on student achievement is produced by educational interventions at the level of substantive pedagogy. The most comprehensive data on this subject are found in Hattie (2009), which consists of a synthesis of more than 800 meta-analytic studies related to student achievement. In one of the most interesting analyses in this book (Table 11.2, p. 244), Hattie calculates the average effect size of two types of educational interventions: interventions that can be classified under the definition of substantive pedagogy versus interventions that can be classified under the definitions of administrative or structural pedagogy. The first category includes interventions pertaining to aspects such as the quality of teaching, feedback to students, or the adoption of metacognitive teaching strategies. The second category includes interventions pertaining to aspects such as increasing the budget, reducing the number of students in each classroom, grouping students by ability within the classroom, or expanding summer studies. Calculation of the average effect sizes of interventions in both categories indicates that the first category is significantly more effective than the second (average effect size of 0.68 vs. 0.08). In other words, these findings suggest that interventions directly related to substantive pedagogy have a far greater impact on student achievement than interventions related to the other types of pedagogy. These figures are quite surprising in light of the widespread belief that increasing budgets or reducing the number of students in the classroom have a significant positive impact on the quality of learning.

What is required to succeed in bringing about a real change in substantive pedagogy? The answer seems simple. One necessary (although insufficient) condition for such a change is focused, well-planned, and intensive engagement with various components of substantive pedagogy. Although this statement sounds almost trivial, it is surprising to see how rarely this condition is met. This statement is true for change processes of all scales, namely for efforts to bring about systemic change in a single school as well as for efforts to improve large educational systems.

The next sections of this chapter examine challenges related to substantive pedagogy at the individual school level by delving into the concept of pedagogical leadership. The final parts of the chapter examine the challenges involved in substantive pedagogy at the level of the whole school system.

**Educational challenges in substantive pedagogy at the individual school level: the search for school based instructional (pedagogical) leadership**

In many educational reform processes, substantive pedagogy is 'transparent': it is not seen as a factor and it is not considered in planning or in implementing educational change processes. In order to bring about change in terms of substantive pedagogy, it is essential to make it a visible component of discussions and planning of educational change processes. In order to manifest this sentiment, there is a need for pedagogical (or instructional) leadership.[[1]](#footnote-1)

To explain the roots of pedagogical leadership, Sergiovanni (1998) draws on the philosophical discussion of human nature and on the two narratives on this subject. The constrained narrative, based on the theory of Hobbes (1950), relates to the selfish side of human nature and its roots in the interest in satisfying one's own physical and emotional needs. According to this narrative, people are self-centered, competitive, cunning, addicted to pleasure, and strive to maximize their own profit without regard for the general welfare. This narrative includes the tendency to put self-interest first, to compete with the goal of winning, and to strive to accumulate and increase personal benefits such as wealth, power, pleasure, and status. Therefore, according to leadership perspectives based on this narrative, principals, teachers, and students must be constrained in order to overcome their natural selfish and violent impulses. Without such constraints, they will not tend to do the right thing. Educational approaches based on this perspective on human nature emphasize accountability, close supervision by principals and teachers, and high-stakes testing. According to this approach, the only way to regulate interpersonal relationships in a school or an educational system is through a strict contract. Only a contract that clarifies the rights and obligations of each individual in the system, including detailed descriptions of the penalties to be enforced if the obligations are not fulfilled, will give people the motivation to work diligently and collaboratively.

In contrast, the “unconstrained narrative” relates to the altruistic aspects of human nature and its roots in moral perceptions of the good. It emphasizes people’s ability to act based on moral considerations and to collaborate with the aim of increasing the general good, even if it is sometimes necessary to sacrifice one’s own personal benefit. Instead of seeing humans as machines driven exclusively by utilitarian considerations and individually-based rational decisions made in an effort to triumph over others, the unconstrained narrative considers the establishment of interpersonal relationships as a component of human motivation. Policy-makers and school leaders who believe in this narrative think that principals and teachers can be trusted to behave morally, and can be given the freedom and autonomy to do the right thing. For example, when trying to promote issues in which they believe, principals and teachers are seen as having the desire and ability to sacrifice their own personal interests for the benefit of the public. As professionals, they will willingly take responsibility for their educational work and commit themselves, first and foremost, to their students’ educational needs. The same applies to students. According to this approach, the correct strategy is to allow greater freedom and autonomy at all levels of the education system, and to avoid accountability, tight supervision, and high-stakes testing. This narrative supports the creation of a community based on a voluntary covenant between its members, rather than on a contract (see Zohar, 2013, Chapter 2).

A community whose members have a covenant among them is a key concept in Sergiovanni's theory of pedagogical leadership (Sergiovanni, 1998). This raises a central question that guides the current discussion, and concerns educational policy-makers and school leaders around the world: why are educational systems unable to improve in ways that make significant changes for prospective school graduates? Sergiovanni suggests that the reason lies in unsatisfactory educational leadership styles. According to him, commonly-accepted educational leadership styles, such as bureaucratic leadership or entrepreneurial leadership, are based on the constrained narrative and therefore require social contracts. The only way to improve education, Sergiovanni asserts, is by changing the educational leadership style to that of pedagogical leadership based on a model of covenant. In schools based on this leadership style, human nature is understood through the unconstrained narrative, and interpersonal relationships are structured as a social covenant. Only under such conditions can a school develop intellectual capital and become a learning community. Pedagogical leaders understand that there is a direct connection between the experiences of teachers and those of their students. They know that inquiry and critical thinking cannot thrive in classrooms if inquiry and questioning are not acceptable for the teachers. It is difficult to cultivate problem-solving skills among students whose teachers rarely solve problems. When dialogue among teachers is limited, dialogue among students becomes difficult as well. The aspiration to transform classrooms into learning communities for students will remain a cliché until schools become learning communities for teachers.

This argument also applies to the relationship between principals and officials in the Ministry of Education: if the relationship between principals and the system in which they work is based on the constrained narrative and a model of contract, it will be difficult for the principals to create a culture based on a covenant model and a community of learning among the teachers.

Having clearly delineated the two extremes, that is, leadership based on a model of covenant versus one based on contract, Sergiovanni concludes that the approach to be adopted in educational systems lies somewhere between these two extremes. However, it is clear from his critique that the prevalent situation in most education systems today is too close to the pole of the contract model rather than the covenant model.

**Pedagogical Leadership in the Professional Literature**

Cuban (1990b) illustrates a model of pedagogical leadership with two contrasting images: the technician and the artist. He argues that people’s image of their role greatly influences how they fulfill it. The image of a technician invokes obedience to instructions from higher authorities, establishing binding rules and procedures, and using technical expertise to efficiently and effectively communicate knowledge to students. Since the establishment of public education, this image has guided teachers and principals, leading them to promote order, routine, and pedagogical tasks that require minimal investment.

However, some leaders hold a radically different image of their role: that of the artist. Although this also requires professional expertise, it calls for far more. This image requires diverse knowledge and skills that enable independent judgment, autonomy, creativity, and imagination. Principals acting according to the artist image emphasize the creation and maintenance of conditions that improve the curriculum and pedagogy. The technician promotes bureaucratic management, while the artist enhances leadership in learning and instruction processes, or in our terminology, pedagogical leadership. Principals working according to the artist image guide and improve the school curriculum and teachers’ instructional processes.

Cuban summarizes research findings spanning a seven-decade period, from the 1920s to the 1990s. The reviewed studies cover various types of professional activities carried out by principals. He divides these activities into two main categories: directing and guiding. In the ‘directing’ category are activities related to maintenance of organizational stability, such as writing reports, developing timetables, solving problems not directly related to learning and instruction, dealing with discipline problems, meeting with parents, budgeting, and decision-making regarding human resources and maintenance of the school buildings. In the ‘guiding’ category are activities focused on improving processes of learning and instruction, such as monitoring the quality of instruction through classroom observations and teacher evaluation, coordinating and evaluating the curriculum, analyzing test results, reviewing students’ report cards, modeling instruction, and guiding workshops for teachers.

The studies Cuban reviewed include data collected from over 8,300 school principals. The findings show that principals said they would prefer to spend their time on activities related to guiding instruction and learning processes. However, when asked how they actually spend their time, the majority said that most of their time was devoted to administrative tasks, and that guiding learning and instruction processes in the school takes a secondary role. Nevertheless, the findings also reveal a great deal of variation among the principals, and some did say they devoted much of their time to pedagogical leadership.

More recent studies suggest that principals who function as pedagogical leaders are more likely to influence students' achievements. For example, a comprehensive review of studies concludes that the influence of pedagogical leadership on students’ achievement is three to four times greater than that of transformational leadership (Robinson, 2010). Elmore (2004) finds that principals can improve learning and instruction by concentrating on pedagogical issues and encouraging other principals to do the same. The professional literature summarizes the issues that principals who function as pedagogical leaders address and the types of activities that they lead. These activities may be divided into two main categories:

1. **Leadership activities that improve learning and instruction (**Elmore, 2004; Hallinger & Heck, 1996; Marzano, 2009, Murphy, Goldring, & Porter, 2006; Robinson, 2010)**:**
* giving priority to understanding prevalent classroom practices and being familiar with multiple teaching approaches and practices;
* assessing the pedagogical state of their school at the whole school (macro) and classroom (micro) levels;
* building a comprehensive pedagogical program to promote the school’s vision, based on empirical data and evidence;
* developing mechanisms to monitor learning, instruction, and classroom activities;
* observing lessons and providing feedback to teachers;
* conducting teachers’ evaluation to improve learning and instruction.
1. **Leadership activities related to guidance and professional development of teachers (**Hallinger & Heck, 2003; Leithwood et al., 2004; Robinson, 2010; Southworth, 2000):
* verifying that the school’s learning goals are clear and directed towards improving teachers’ instructional capabilities.;
* focusing teachers’ learning processes on instructional practices;
* basing professional development on analyzing examples of students’ work;
* creating an atmosphere of trust and collegiality for teachers’ professional education;
* leading the school’s professional development processes: planning, facilitating, participating, and guiding teachers’ learning.

The literature offers various definitions of the terms ‘instructional leadership’ or ‘pedagogical leadership’, which are sometimes used to delineate the same thing. For example, Shaked, Gross, and Glanz (2017) summarize five core dimensions of instructional leadership activities:

(a) establishing a school vision that includes clear learning goals, and getting commitment to these goals from throughout the school and wider community;

(b) sharing leadership with trained teacher leaders to improve school effectiveness;

(c) creating a community of learning that enables staff development;

(d) collecting data to guide instructional decision-making; and

(e) monitoring instruction in classrooms, encouraging implementation of high-quality curriculum and instructional practices.

It is important to emphasize that the pedagogical leader in a school is not necessarily the principal. The key point is that this person actively engages in leadership and focuses on substantive pedagogy. This leader may be another designated authority figure within the school, who perceives pedagogical leadership as a top personal priority (Cuban, 1990b). Thus, pedagogical leaders may be vice-principals, pedagogical directors, coordinators for a subject area or grade level, or even teachers who hold no official leadership position in the school. Pedagogical leaders who are not employed by a school may include mentors, teacher educators, superintendents, or other officials in the educational system or in local education councils. Neumersky (2012) notes that research in this field has not yet recognized that pedagogical leadership can occur outside standard organizational positions, and that researchers often fail to recognize that people holding diverse roles may be pedagogical leaders. She claims this hinders our ability to fully understand the phenomenon of pedagogical leadership and to apply relevant research findings to improve practice. In order to improve theory and practice in this field, Neumersky calls for uniting the research on pedagogical leadership across different organizational levels.

**Pedagogical Leadership in the Israeli Educational System**

In 2008, the Avney Rosha, The Israeli Institute for the Development of School Principals, initiated a survey of principals in primary and secondary schools (Katz et al., 2008). The survey provided vital demographic data on principals, described their positions and preferences regarding several key issues, and outlined the major leadership patterns emerging from their work.

One survey item gave the principals a list of potential goals for their school and asked them to select the one that they considered the most important. The most frequently selected goal (although indicated as a priority by only 20% of the principals) was to improve students' achievements. Improving students’ learning and thinking abilities was chosen by 13.8% of the principals. Only 3% selected teachers’ professional development as their primary goal. From this, we can conclude that goals focusing on substantive pedagogy are not the top priority of principals in Israel.

Another questionnaire item asked the principals to rate different images of an ideal principal on a 6-point scale (with 6 as the highest rating). The highest-rated image (with an average rating of 4.18) was being a leader and decision-maker. This is not necessarily considered part of substantive pedagogy. The image of the principal as a pedagogical leader was ranked in fourth place (average score of 3.58). The image of being an organizational leader was ranked even lower, in fifth place (average rating of 2.61).

The findings also indicate diversity among principals according to the level of school in which they work. For example, high school principals indicated less engagement with developing students' learning and thinking skills than did their peers in primary schools (7% of high school principals versus 13.8% respectively). This finding is supported by a more recent study on gender differences in pedagogical leadership in Israel (Shaked et al., 2017). The study found that males constitute a majority of principals in Israeli secondary schools (61% of the sample), and females constitute the majority of principals in the primary schools (92%). The data show that female principals relied more heavily on teaching experience and pedagogical knowledge in the course of their work and were more involved with improving teaching and learning in their school, as compared with male principals. Male principals had, on average, less teaching experience and were more likely to delegate tasks related to improving instruction and learning to others (Shaked et al., 2017).

Since the 2008 Avney Rosha survey, there has been increasing emphasis on pedagogical leadership, both in research and in the practice of developing school leadership in Israel. In 2009, Avney Rosha announced its first "call for proposals" for Israeli academic institutions to offer professional development courses for school principals. Evaluation of the first two cohorts of these programs indicated a need for an increased emphasis on pedagogical leadership and on the knowledge it involves. As a result, in 2012 Avney Rosha announced a subsequent call for a second round of professional development courses for principals, emphasizing pedagogical leadership. In particular, the call of proposals noted the need to provide up-to-date and practical knowledge in areas of learning and instruction in order to improve student achievements (Israel Institute for School Leadership, 2012). In fact, instructional leadership and school improvement was the main focus for the new programs. The text of the second call for proposals clarified that the next round of professional development courses for principals would need to provide prospective principals with up-to-date and practical knowledge in the area of substantial pedagogy. Nevertheless, it is important to ask critically whether this second round of professional development programs indeed provided principals with the relevant, practical knowledge required to implement advanced pedagogies, such as teaching higher-order thinking. In addition, it should be noted, that because of a severe shortage of school principals, many individuals who recently took positions as school principals did not take part in Avney Rosha's professional development program for prospective principals (Detel, 2018). These individuals thus clearly did not have the opportunity to enjoy the new curriculum of the principal development program, making it less likely that they will center on instructional leadership as an important part of their job.

**A View from the Field: M's Search for Substantive Pedagogy**

 When I met M., she was about to begin her second term as the principal of a new elementary school in a well-established area in Israel. She had recently taken a study leave, following successful completion of first position as the principal of an elementary school in a high-risk neighborhood, at which she had earned a prestigious educational award. M. requested an informal consultation with me to discuss the educational policy she would like implement at her new school. A core aspect of her educational vision related to implementing innovative pedagogies, focused on inquiry learning and higher-order thinking. During our conversation, she described her work plan in detail. The entire school would devote time to studying one common subject, which would change each semester. Working in multi-age groups, students would explore this subject according to their individual interests. At the peak of the program, the normal class schedules would be suspended for one week, and the entire school would be involved in inquiry-based learning and in working on the final products of their projects that would later be presented to the parents.

M. was concerned that this process would result in gimmicks or, as she put it, “a lot of bells and whistles”. M. noted that she believes in the potential of such programs to promote inquiry, thinking and learning, but had already seen how all too often they become superficial and detached from what she called "real learning". According to M., such activities tend to emphasize creative products, such as student performances or works of art (exhibits, videos, etc.) that receive praise, but she wondered to what extent they are related to deep processes that would significantly develop students’ knowledge and skills. It is easy to understand M.'s concern in light of the picture I portrayed at the beginning of the previous chapter. She did not want to find herself in a similar situation.

I asked her to explain the specific learning goals for students within the framework she described, and what professional development the teachers would receive to guide their students towards these goals. She replied honestly that she had not yet thought about these questions and did not know how to develop a detailed and structured work plan to address them. Additionally, she did not know what to do so that the desired inquiry-based approach to learning would affect the whole school, including routine learning of the ‘regular’ school subjects, rather than remain limited to these specific activities.

In light of the conceptual framework presented at the beginning of this chapter, M. was undoubtedly a pedagogical leader because her goal was to improve learning and instruction at her school. However, she lacked the practical knowledge necessary to lead this change. Although she aspired for a profound change in learning, the plan she developed for her first year at the new school operated at the level of structural pedagogy. She explained the lack of planning at the level of substantive pedagogy, primarily by saying she did not feel she had the necessary tools. She approached me for advice because she was justifiably worried that changes made at the level of structural pedagogy would not impact learning and instruction processes at the school in a deep way, and would therefore fail to bring about the desired pedagogical change.

The advice she received consisted of three stages: (1) to initiate a long-term, collaborative learning process for herself and a group of leading teachers, led by pedagogical experts. This would help identify the core elements for deep and meaningful inquiry-based learning and to construct pertinent teaching strategies; (2) to call upon this group of leading teachers to help design a detailed pedagogical plan for learning and instruction in the school; (3) to gradually extend the professional development processes to growing numbers of teachers. Thus, by developing the capabilities of the principal and a gradually expanding circle of teachers, it would be possible to plan and implement a profound change in in the substantive pedagogy of a school.

**The Conditions for Successful Instructional Leadership**

Professional development is a necessary condition for principals to be able to lead change in substantive pedagogy. However, professional development alone is not sufficient to make this their priority. In order for principals to be able to focus on deep improvements in learning and instruction in their schools, they need a supportive environment. One relevant question is the extent to which the Ministry of Education provides such an environment.

In the summer of 2015, a comprehensive survey of school principals in Israel was commissioned by the Principals' Union in cooperation with the Association of Secondary School Teachers. The survey was carried out by the Geocartography Knowledge Group (Kashti, 2016). The survey population included about 300 out of a total of 700 principals of secondary schools in Israel. The findings reveal deep mistrust between high school principals and officials at all levels of the Ministry of Education. According to the principals, the senior officials are unfamiliar with the reality in the schools and preoccupied with rolling out reforms, while the direct supervisors and representatives of units in the Ministry are mainly concerned with delegating responsibility. According to a veteran principal from Israel's northern region, "The role of the principal is one of the most lonely and isolated within the education system. The principal has to deal with the sometimes-conflicting demands of students, parents, teachers, the local authority, and the Ministry of Education. Unfortunately, I do not feel that the Ministry of Education is helping me with this complex task."

According to the survey, the vast majority of principals - between 80% and 90% - feel the Ministry is imposing ever-increasing responsibility on them. A similar percentage feels that they spend too much time on mundane, mandatory bureaucratic tasks. The principals note that the Ministry of Education has two main types of responses to problems. The first is delegating growing responsibility to the principals for a long list of issues, from students with learning disabilities to narrowing the socio-economic gaps in Israeli society. The second is a growing demand for writing reports, filling out forms, and other bureaucratic tasks. The chapter on labor relations between principals and the Ministry of Education indicate that the principals feel that the Ministry officials distrust them and do not appreciate them. Moreover, 75% of the principals said that at Ministry of Education sponsored conferences, they are afraid to express their true opinions, and therefore the Ministry officials think everyone is satisfied. The principals’ responses contradict recent statements by officials in the Israel Ministry of Education, who proclaim their trust and faith in teachers and principals. According to one principal, the Ministry cannot claim to trust principals and at the same time closely monitor everything they do. Having to constantly protect themselves against potential complains from the Ministry prevents principals from developing their leadership capabilities

The principals’ views regarding the pedagogical component of their work are similarly discouraging. As a principal from a school in Israel’s central region explained, “The pedagogical component of the principal's work is steadily eroding. No one cares what the school's vision is, let alone how it can be achieved and realized. All the emphasis is on mechanical management. There are principals who are interested in and committed to pedagogy, but they are few,” (Kashti, 2016). In other words, this survey indicates that most principals of secondary schools in Israel feel that their relationship with the educational authorities is built on the contract model rather than the covenant model. It is hard to believe that in such a work environment, many high school principals would be able to focus on substantive pedagogy, even if they learn about it in professional development processes.

In summary, principals' engagement with the level of substantive pedagogy, is crucial for their ability to lead change processes that deeply affect learning and instruction at their school. Only a minority of principals see this as their main role. Even these principals, however, often work at the level of structural pedagogy, because they often lack the knowledge needed to lead changes at the level of substantive pedagogy, and lack a supportive work environment provided by the Ministry of Education.

**Challenges in Addressing Substantive Pedagogy at the Level of Large Educational Systems**

The challenges of implementing substantive pedagogy at the level of the individual school, as described in the previous section, are intensified at the systemic level. To illustrate this, I draw on analysis of two cases. The first is based on a fascinating exploration of knowledge among people leading a broad systemic reform in mathematics instruction in the United States. The second is based on analysis of an Information and Communications Technology (ICT) program implemented in Israel beginning in 2009.

**U.S. Mathematics Instruction Reform Circumvent Substantive Pedagogy**

In the first study, Spillane (2000) uses a cognitive lens to explore perceptions held by district leaders following a reform in learning and instruction initiated by the U.S. National Council of Teachers of Mathematics. The goal of the reform was to change instructional methods away from imparting procedural knowledge, computation, memorization, and following predictable steps to calculate answers to mathematics problems. Instead, instruction would be geared towards imparting knowledge of mathematical principles, that is emphasizing ideas, concepts, and mathematical thinking. That is, the goal of the reform was to change substantial pedagogy.

Spillane’s main goal was to investigate district leaders’ understanding of the mathematics reform, that is, the ideas and perceptions they constructed following their involvement in the reform’s implementation. According to Spillane, these leaders understood that the reform represented a change in policies and curricula for mathematics instruction, but their understanding was partial, and tended to overlook the full significance of the reform.

In analyzing his findings, Spillane draws on concepts that parallel those of substantive pedagogy and structural pedagogy, as defined earlier in this chapter. He cites previous research that differentiates between form-focused and function-focused understandings in mathematics instruction (Gearhart et al., 1997; Saxe et al., 1999). Form-focused understandings refer to learning activities, educational materials, and various arrangements for individual and group student work. Function-focused understandings refer to activities such as collaborative learning, problem solving, and visualization, which enable students to develop understandings of mathematical functions, principles, concepts, and patterns of thought. The concept of form-focused understandings parallels that of structural pedagogy, while the concept of function-focused understandings parallels substantive pedagogy. Therefore, from here on I will use these latter terms to describe the findings of Spillane’s research.

Through a series of in-depth interviews, Spillane shows that 62 of the 82 change leaders in the study population perceived the reform they led as related to structural rather than substantive pedagogy. In their view, the reform focused on using demonstrations, changing the structure of group work in mathematics classes, and more frequent use of examples of mathematical problems relevant to daily life. But these strategies preserved old conceptions of mathematics instruction, such as transmitting procedural knowledge, rather than bringing about a new type of learning focused on deep understanding of mathematical principles. These leaders drew on their previous knowledge and concepts regarding the goals of mathematics instruction as an interpretative framework through which they understood the reform. Innovations in the structure of teaching (such as group work, demonstrations, or work on mathematical communication), were perceived as ends to themselves rather than as vehicles designed to create a fundamental change in the class discourse and lead to new understandings of mathematical knowledge. Although changes in structural pedagogy do have the potential to influence substantive pedagogy, this potential was not realized, and substantive pedagogy remained untouched.

**Lost Substantive Pedagogy in the initial stages of a National ICT Program in Israel**

Implementation of a new national Information Communications Technologies (ICT) program was one of the goals for the educational system in Israel during Gideon Sa'ar's term as Minister of Education (2009-2013). As explained previously, use of ICT in schools can bring about a change in substantive pedagogy. For example, computerized animations and simulations may help improve understanding. Interactive software can increase students’ motivation and enable them to construct knowledge in an independent way. Real-time tracking of each student's progress and providing instant feedback can facilitate personalized instruction. Searching the Internet calls for establishing connections with the real world outside school, which can make learning more relevant.

However, substantive changes do not occur incidentally, as by-products of technological changes at the administrative and structural levels. We need to define them as central and explicit goals, and to focus much of our implementation efforts and attention to bringing them about. Use of ICT is not a sufficient condition, and not even a necessary condition, for realizing a change in substantive pedagogy. Moreover, previous experiences from similar ICT programs in Israel and other countries has shown that new technologies alone are insufficient to improve learning and instruction. To achieve such improvement, it is necessary that teachers will be able to fulfill the pedagogical potential embedded in the new technological means. There is little value in upgrading the technology unless there is a corresponding upgrading of the pedagogy (Salomon, 2000). The success of an ICT program should not be measured mainly by the number of teachers and students using it (a change in structural pedagogy), but more importantly by the quality of learning and instruction it produces (i.e., measures addressing the level of substantive pedagogy). In a study examining these issues, I asked the following research question: in the early years of its implementation, did this Israeli national ICT program address aspects of substantive pedagogy?

In order to answer this question, I analyzed public documents published two years after the launch of the program, and uploaded on the Internet. The analysis revealed that, in terms of its vision, the program went beyond administrative and structural goals, because it did offer an educational vision recognizing the challenges and needs of school graduates in the 21st century (Israel Ministry of Education, 2012). The section entitled Vision and Perception noted that: "In preparing graduates of the education system for the world of employment and academia in the 21st century, it must be recognized that the skills they need differ from those needed in the 20th century. The education system must adapt itself to these demands." The document clarified that the goal was to provide future graduates with the skills needed in the 21st century, which include use of ICT tools, information literacy, communication, critical thinking, and problem-solving skills. In a rapidly changing world, which requires innovation, critical thinking, and analysis, students must be taught to be creative entrepreneurs and to draw on multiple sources of information. They must be able to recognize and understand the connections between concepts, and to identify various strategies for accomplishing tasks. Students must be aware of differing attitudes and opinions, be capable of making predictions, be intuitive, skeptical, able to think critically, know how to do research, make decisions, and have metacognitive thinking skills,” (ibid.).

Thus, the stated goals of this national ICT program do address diverse aspects related to substantive pedagogy. But is substantive pedagogy also reflected in the practical applications of the program, as described in the detailed instructions for implementation and in the indices for assessing outputs? Analysis of the ICT program documents indicates that the implementation process was planned carefully, especially in terms of indices measuring performance and outputs. However, while multiple sections refer to structural or administrative pedagogy, there is little reference to aspects of substantive pedagogy. The program documents deal with strict technical specifications, detailed work plans, and instructions for implementation. These cover the main activities that the schools must carry out. There are explicit statements regarding the expected outputs at the level of administrative pedagogy, such as reporting on attendance, disciplinary events, the subjects of lessons, and homework.

There are also many statements that address the level of structural pedagogy. For example, in each of five core school subjects, there must be one weekly computer lesson during the first semester and two weekly computer lessons during the second semester of the program’s first year of implementation. However, the long list of outputs does not include any in the dimension of substantive pedagogy. The published documents include numerous forms for reporting on various details of the implementation, but most of these relate to administrative or structural pedagogy. An individual work plan for teachers includes one limited reference to substantive pedagogy: a section on 21st century skills such as critical thinking and problem solving (pp. 22-23). However, this gets lost among the long list of bureaucratic items on which the teacher is required to report.

It seems that Israel’s national ICT program did not devote adequate attention, at least in its early stages, to changes at the level of substantive pedagogy, that is, to innovative instruction of higher-order thinking and deep understanding in a digital learning environment. However, it should be noted that some of the schools that implemented this ICT program did an impressive job and did improved various aspects of substantive pedagogy. These schools are 'islands' of pedagogical excellence, led by determined principals who acted as pedagogical leaders. They confirm that it is indeed possible to change the substantive pedagogy of a school by implementing an ICT program in an appropriate way. Unfortunately, they are exceptions to the rule.

In order to realize the goal of creating school graduates with strong intellectual skills, the national ICT program needs to make sure that this goal is reflected in the practical details regarding indicators of performance and of outputs. As it is, the goal related to substantive pedagogy is indeed detailed on the declarative level in the policy documents stating the program's master plan, but is then lost among countless sections addressing administrative and structural pedagogy. Consequently, the national ICT program exhibits a gap between the stated goal addressing the substantive pedagogy (developing understanding, thinking, creativity, entrepreneurship, etc.) and the implementation of this goal. There is no detailed and organized work plan concerning substantive changes in in learning and instruction. Therefore, even if the program succeeded in implementing its administrative and structural goals, it did not succeed in making a deep change in learning and instruction methods.

**Discussion and Conclusions**

In this chapter, I defined the concepts of administrative, structural and substantive pedagogy. Further, I outlined one of the main arguments of the book: in order to achieve optimal outcomes in connecting the isolated islands of pedagogical excellence into a continent, changes must be made in terms of substantive pedagogy, rather than only in terms of administrative and structural pedagogy. Pedagogical leadership is a necessary condition for such a change. Only this can enable educational leaders to address the essence of instruction, and not deal only with the structures that dictate the frameworks and conditions under which instruction is carried out. This statement is relevant to all the administrative levels of the education system: from vocational centers, department coordinators, pedagogical coordinators, school principals, and leaders in teacher training institutions, up through change leaders at the level of the whole school system. In order to enable pedagogical leaders to make the changes necessary for teaching for deep learning, a culture of covenant rather than contract is required.

It may seem obvious that in order to bring about a profound change in the quality of learning and instruction, educational processes must focus on substantive pedagogy. However, this basic insight is far from simple to transmit. Analysis of studies from Israel and from the United States (in Spillane's research), describes various attempts to implement systemic changes which failed to address substantive pedagogy. In each of these cases, these deficiencies limited the possibility of realizing the desired profound improvement in processes of learning and instruction.

1. On the components of pedagogical leadership, see Shaked et al., 2017. [↑](#footnote-ref-1)