International Journal of Education Policy & Leadership

COLLABORATIVE LEARNING IN A BOUNDARY ZONE: A CASE STUDY OF INNOVATIVE INTER-INSTITUTIONAL COLLABORATION IN ISRAEL

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This qualitative study focused on the collaboration between a school district and a college of education in Israel and aimed to explore how the participants created common understanding in order to promote educational change. The theoretical approach involved analyzing the institutional interconnections based on boundary practices and boundary objects and the ways these interconnections shaped the collaborative learning process, promoted educational change, and fostered educational leadership in the district and in the college. The study observed the formation of a community of practice within the boundary zone, which was developed over a three-year period by a group of 20 superintendents, the district head, and two teacher educators. Beyond concrete outcomes, such as improvement of pupils' scores on the state-mandated achievement tests, the study showed a transformation in the superintendents' perception of their roles and a cultural change in the district.

Tabak, E. & Margolin, I. (2013). Collaborative Learning in a Boundary Zone: A Case Study of Innovative Inter-Institutional Collaboration in Israel. *International Journal of Education Policy & Leadership 8*(4). Retrieved from www.ijepl.org .

The concept of interdisciplinary approaches seems to be suitable to address the complex issues of education and promoting change. This idea has been reflected in a variety of multiprofessional collaborative studies (Carlile, 2002; Star & Griesemer, 1989) and investigations of school-work transitions (Kerosuo & Engeström, 2003; Nosek, 2004; Tuomi-Grohn & Engestrom, 2003), including partnerships between educational institutions (Gorodetsky, Barak, & Harari, 2007; Zellermayer & Tabak, 2007). These studies have shown that instead of professional work being perceived as occurring within a bounded domain, emphases are being placed on multiple interacting systems.

The consequence is that the focus has shifted from the single community as a unit of analysis to the process of different cultures engaged in collaborative interactions. The space where interrelated activities occur is called a boundary zone (Tuomi-Grohn, 2005). Since boundary zones do not belong to any particular community, they enable different entities to be involved in the process of management and coordination of knowledge and resources among participants from diverse communities of practice.

In order to describe the process that takes place in the boundary zones, the literature in the field has adopted two concepts: *boundary encounters* (Wenger, 2000) and *boundary ob-*

jects (Star & Griesemer, 1989). These mechanisms are critical to interactions in communities of practice.

Boundary encounters occur when participants in the practice of a community engage in activities with members of another community. In education, these boundary encounters facilitate conversations among district leaders, academic faculty, school leaders, and teachers and contribute to the development of the human resources of the communities. Throughout their participation in the boundary encounters, the participants coordinate their varying perspectives and develop common routines and *boundary practices*. These are recognizable patterns of interdependent actions that become embedded in the common practice and are expected and delivered on a regular basis (Cobb, McClain, Silva Lamberg, & Dean, 2003; Hallett, 2007; Halverson, 2007; Spillane & Diamond, 2007; Wenger, 1998, 2000).

The second type of interconnection among communities of practice is less visible and is based on what Wenger (1998) terms *reification,* rather than on participation. Wenger defines reification as a "process of giving form to our experience by producing objects that congeal this experience into thingness" (p. 58). A *boundary object* is a reifying idea, "a relatively transparent carrier of meaning for members of the community in which it was created" (Cobb et al., 2003, p. 19).

Following Star and Griesemer (1989) and Carlile (2002), the boundary object is described as abstract and concrete, general and specific, conventional and user-adapted, material and conceptual. It is a partial and temporary bridge that is sufficiently unstructured when used jointly and highly structured when used within one of the communities involved. The shared use of objects and terms enables them to function as common boundary objects around which the members of different communities can organize their activity.

A review of studies dealing with the two concepts, boundary practices and boundary objects (Akkerman & Bakker, 2009; Carlile, 2002), identified four characteristics linked to what should happen in the boundary zone and how diversity among communities is negotiated. The four characteristics are as follows:

1. A boundary object establishes a shared syntax or language for individuals to represent their knowledge. Boundary encounters enable communication in which the differences among the various parties are made explicit. Although shared syntax is an essential feature for dealing with the boundary, it is not sufficient for promoting learning and transformation.
2. A boundary object establishes a shared semantic base that provides a concrete means for individuals to specify and maintain differences and dependencies across the boundaries. In this case, the focus is coordination at the boundary. Boundary encounters aim to establish effective routines for engaging in cooperative actions.
3. A boundary object establishes a shared semantic and emotional base that encourages reflection. Boundary encounters lead to a realization of differences between perspectives and practices and involve the possibility of learning about diversity and observing oneself through the eyes of another.
4. A boundary object establishes a shared pragmatic boundary that facilitates a process in which individuals can jointly transform their knowledge by negotiating meanings and changing the representations used.

This study focused on the boundary practices and boundary objects that developed in the intersection between a school district and a college of education. The study also investigated how participants from different communities, when called upon to cooperate, managed diversity in order to promote leadership and educational change.

Context of the Study

The boundary zone described in this study is the space between the Ministry of Education (MOE) supervisory structure and the staff of a

teacher education college (TEC). In Israel, national policy for education is outlined by the MOE. The country is divided into five school districts by region, and a district head in each region is charged with the job of applying national policy at local levels according to local needs and specifications.

In Israel, TECs train candidates for work in early education, primary education, special education, and middle school education. These colleges are under the jurisdiction of the MOE and aim to integrate the educational policies of the ministry into the practical field work of the trainees in the school.

In a sense, these two organizations work in tandem but in separate parallel modes for top-down change within the public school system. The district in this study is the largest in the country. The student population of this district derives from varied cultural backgrounds (recent immigrants, veteran population), varied religious beliefs (Muslims, Jews, Christians), and varied socioeconomic levels. This district includes about 60 local authorities, with 360,000 pupils attending 660 schools and more than 2,500 kindergartens. Academic administrative personnel include 40 superintendents, 20 counselors, and 660 principals. The size of the district, its diversity, and the partnership with the college create a situation that is worthy of being studied.

There is a district head and 40 superintendents who work in various content areas: Hebrew language, English, mathematics, history, and so on. In addition to curricular matters, superintendents are responsible for designing specific educational programs according to the school district's particular needs and unique style.

Traditionally, most Israeli superintendents work in relative isolation, having access to a limited professional network consisting of weekly meetings, while the district head deals with technical and managerial tasks.

The college in this study is one of the largest TECs in Israel, with more than 1,000 undergraduate and graduate students and 300 full-time faculty members.

The collaboration between the district and the college of education was triggered by concerns from school principals about pupils' low scores in the state-mandated achievement tests, which lead to the decision by the district head to investigate and implement means to improve these scores. While analyzing ways to improve student test scores, the district head realized that she was not alone in her attempt to achieve this goal. Projects and initiatives were ongoing but lacked coordination. Furthermore, the methods for achieving the goal were varied and, at times, conflicting. Tension and misunderstanding hindered progress in achieving the universally desired target of improved student achievement.

In addition, the district head was concerned about the discrepancy between systems and structures on the one hand and everyday practices on the other. She was well aware that school reforms did not permeate the everyday practices of teaching and learning in the classrooms.

In order to deal with these issues—poor academic achievement, multiple agendas in the district, and the gap between policy and implementation—the district head invited experts from a TEC to assist her in her attempt to improve the situation. The head of an experimental teacher education program at the college (Margolin, 2007) and the head of the school of education accepted this invitation and took on the role of facilitators seeking to develop a safe space for collaborative learning, mutual engagement, and emerging leadership.

The district head felt that the change in the situation could be made through changes in the role the superintendents played in the schools. Thus, she selected 20 of the 40 superintendents in the district and established a professional learning community (PLC) for this group (Hargreaves & Fink, 2006; Tucker, 2008; Wells & Feun, 2007). She believed that this community would be a workable group that could serve as a pilot for the larger group at a later time. Her aim was that this PLC would generate change by working collaboratively with schools and principals, implementing state reform in schools, and changing

teachers' classroom practices from teaching frontal, whole class lessons to focusing on differential treatment of pupils (Margolin, 2012).

In order to promote new approaches to collaborative learning and enable the superintendents to experience daily collaboration by working with their schools, the two teacher educators designed an innovative model in this PLC. They created teams of two to three superintendents from various content areas to work collaboratively. Each team selected an underperforming school and worked with its principal and teachers intensively. These schools served as "learning laboratories" aimed at facilitating collaborative learning and developing meaningful teaching and learning.

Through this partnership over a three-year period, the PLC group of 20 superintendents, the district head, and the two teacher educators participated in bimonthly meetings in which the superintendents discussed observations from the field and analyzed them, identifying central issues and getting advice and insights from colleagues. The teacher educators linked the issues of the participants to relevant research literature and led dialogues about the various interpretations and implementation of innovations. They also focused on observations inside classes and conducted collaborative analysis and feedback conversations.

This study observed the development of this inter-institutional collaboration and the formation of a community of practice within the boundary zone. The research question was: How do the participants create common understanding and collaborative learning in order to facilitate leadership, implement educational policies, and improve educational achievement?

Methodology

This qualitative research is a case study focused on the three-year partnership developed between the largest district in the MOE and a TEC. The case study research methodology was specifically chosen because it is an empirical inquiry that enables an in-depth investigation of a phenomenon within its real-life context, which in this case is unique and represents a special type of collaboration rarely found in common practice or in research literature.

Although a study of one case has limitations because it focuses on a single district, located in a particular place and time, and comprises a given number of participants (Stake, 1995), it is believed that much can be learned from the comprehensive description of this particular case, which relies on multiple sources of evidence (Merriam, 1998). Moreover, this methodology is relevant because it is adequate to the examination of an environment where the boundaries between the phenomenon of interest and context are not clearly evident (Yin, 2003).

Participants

The participants were: (a) the district head; (b) 20 superintendents, each responsible for 20–30 schools, including the following areas: mathematics, English, Hebrew language, and counseling; (c) five principals; (d) school teachers; and (e) two senior teacher educators (the researchers and authors of this report), who in this report are known collectively as "the researchers," and co-led the PLC with the district head.

Data Collection and Analysis

In order to explore the meaning of the low-achievement level more deeply, the focus was placed on 20 elementary schools randomly selected by the superintendents as "laboratory schools." To strengthen the data, they were collected from various sources at various times over the three years.

The data draw on: (a) transcriptions of 20 bimonthly meetings of all the community members; (b) five conferences between the researchers; (c) notes from five whole-day visits to schools by all the participating superintendents, the researchers, and the district head; (d) group discussions which took place during three meetings with principals; and (e) five interviews with five principals.

The data were analyzed by the researchers using an inductive approach in order to develop a coding framework and achieve theoretically informed interpretations (Strauss & Corbin, 1990). The analysis process consisted of four phases: (a) all transcripts were given a full holistic reading and words, phrases, events, or categories were identified via a close examination of the data; (b) the various categories were discussed and interpreted with reflection on the literature concerning interinstitutional collaboration and participation across boundaries; (c) the concepts of *boundary objects* and *boundary practices* were agreed upon as the two main categories by means of the dialectical process between the data and the literature; and (d) the data was reinterpreted according to these categories, interpretations were developed, and the most relevant examples were chosen to exemplify them.

The data from different sources were triangulated, and the interpretations were shared with the participants. The convergence of data collected through observations and interviews serves the purpose of completeness, providing in-depth information. The dialectical process data-theory (Glaser & Strauss, 1967) enhances the reliability and validity of the findings. Mutual interpretations led to integration and creation of new meanings.

Findings

In this section, some examples of boundary objects and boundary practices will be presented. The findings represent the collaborative learning process identified throughout the data analysis.

Boundary Objects

The data analysis revealed three categories of boundary objects: (a) data and measures; (b) standardized forms and methods; and (c) concepts.

Data and Measures. During the bimonthly meetings, the superintendents had an opportunity to map the schools and describe their contexts. At the beginning of the collaboration (the first year), they did this by presenting the data from a particular school (test scores, demographic data, and school facts and figures). This information functioned effectively as a common source in order to draw quantitative comparisons among different functional settings when dealing with the low test scores in different schools. Indeed, a fruitful conversation took place when one of the superintendents shared the scores of the pupils in one of her schools, comparing those scores with the average national scores on the state-mandated achievement tests.

In this case, data and measures worked as boundary objects that succeeded in establishing a shared syntax in the community, providing common definitions and values of the ubiquitous problem of low scores. However, while these boundary objects represented the mutual problem, they did not have the capacity to promote the creation of new solutions.

Standardized Forms and Methods. The boundary objects in this category were exposed when, at the beginning of the second year, one of the veteran superintendents criticized the researchers, saying: "You [teacher educators] know theory, but you don't know how things are done in real life." She expressed her dissatisfaction with the researchers' guidance and said that she expected "to be given new solutions to problems and a detailed plan to implement change in schools" (bimonthly meeting, October 3, 2007).

All the veteran superintendents agreed with her and stressed their knowledge of helping schools improve the quality of teaching and learning. The researchers invited the superintendents to share their experiences and successes with their colleagues and to jointly plan how to promote change.

However, only one superintendent accepted the challenge. Her presentation revealed standardized forms and methods that were identified as boundary objects because they appeared in a mutually understood structure and language. In her presentation she included shared tools, such as standards, problem-

solving methods, and teachers' learning in professional centers outside of the schools.

One of these standardized forms and methods was the annual school plan. The superintendent described the amount of time she had spent devising these annual plans and discussing the general situation in the school in conjunction with the principal and the coordinators. It seemed that she had been distancing herself from the classrooms, thereby widening the gap between planning and doing. From the ensuing discussion, it became evident that all the superintendents used similar forms and methods with their schools and devoted most of their time to planning and discussion with the principals.

The researchers' mutual understanding was that, on the one hand, these categories of boundary objects allowed for sharing of the definition and categorization of problems and promoted discussions and a deeper understanding, but on the other hand, no new knowledge or action plans had emerged.

Concepts. In order to shift the focus from the principal's office into the classroom and to close the gap between planning and acting, a culture of observations and feedback was initiated by the researchers and the superintendents. In tandem, research literature about tools of inquiry and information about diverse projects whose purpose was to improve the quality of teaching and learning in schools were presented. One of these projects was the Prospect Center's "Descriptive Review of the Child" (Himley & Carini, 2000), which focuses on the individual and unique child and aims at making the whole child visible. At the end of the second year, a concept that emerged during several bimonthly meetings, which facilitated the establishment of a shared boundary object, was that of the individual child.

One team of superintendents became excited about this concept and promoted a project with an individual child in their laboratory school. They suggested to the principal that all the teachers teaching different subjects be focused on conducting observations of an individual child and documenting these observations. Initially, the teachers refused to go along with the new idea, claiming: "The child I focused on is stuck; what can I do with him?" (visit to school, September 2, 2008). The school principal, however, was enthusiastic and decided to work collaboratively with her teachers and the two superintendents.

They focused on this concept and developed routines aimed at becoming acquainted with the child as an individual, and they designed a supportive learning environment for him. For example, they conducted observations for data collection and convened weekly meetings in order to analyze the data and learn about the child and about their work. They realized that their observations of the child enabled them to develop new insights about him and about their teaching and themselves (see Appendix A for boundary practices based on observation, documentation, and reflection that is focused on the pupils and aimed at personalization and demonstration of students' mastery).

Moreover, they felt that they were able to develop appropriate programs of action for the child based on the data collected and in response to his needs. They were very excited about it, as reflected in the following comments:

> Liel (English teacher): *We have just begun to use observations. And I feel so excited, because we can stay here and discuss, analyze, suggest what to change, what to do to empower the child. And it helps; we can improve our teaching and increase the child's achievements.*
>
> Avital (Hebrew teacher): *And we are open-minded, not afraid to be criticized.*
>
> Shosh (Hebrew teacher): *It's amazing. Nobody is an "ideal teacher." We can learn all the time, and change, and try other things* (visit to school, May 15, 2009).

The visits to the schools where the superintendents observed the differential work with

one child and with small groups indicated the change that the focus on the individual child generated in the teachers' conceptions about teaching and learning. This activity, in which the superintendents moved from their administrative roles into the classroom with teachers and pupils, took place in the boundary zone created by this program.

Time was spent evaluating the processes, discussing critical issues and conflicts, and promoting the community's continuous learning according to the issues that arose during the discussions. The following is an example of the comments from those discussions:

> Rita (Mathematics teacher): *It took me a long time to become aware that even if it seems to me that children enjoyed my lesson, it does not mean they had learnt. When I sit with them and talk with them about their interpretations and their different points of view, they learn more. I am not the center of the class, but I am a partner and they can express their own ideas and accomplish their own achievements* (interview, June 20, 2009).

The superintendents felt that there was a need to develop rubrics and indicators in order to evaluate the quality of the interactions between teachers and the individual child. After doing so in the community, the superintendents initiated this process in their schools and encouraged teachers and additional principals to develop their own assessment tools (see Appendix B for the criteria used for assessing the learning taking place in a small group).

A sense of continuity began to develop between the PLC and the activity in the laboratory schools, and the superintendents started promoting educational initiatives and innovations throughout the entire district. They succeeded in convincing teachers and principals to revise their practices and introduce change. This major development, which occurred as a result of the collaboration between the two communities—the college and the educational district, centered on conversations, negotiation of meanings, and consultations with regard to this central concept of *the individual child*. The researchers identified the concept as a boundary object because it encouraged participants to reflect on their current practices. The participants transformed their assumptions about learning and teaching, developed new knowledge, changed strategies, and adopted new ways of acting.

After two years of inter-institutional collaboration focusing on the individual child, the proportion of pupils testing at or above the national norms increased in the laboratory schools, professional learning communities were developed in the schools, and schools manifested progress.

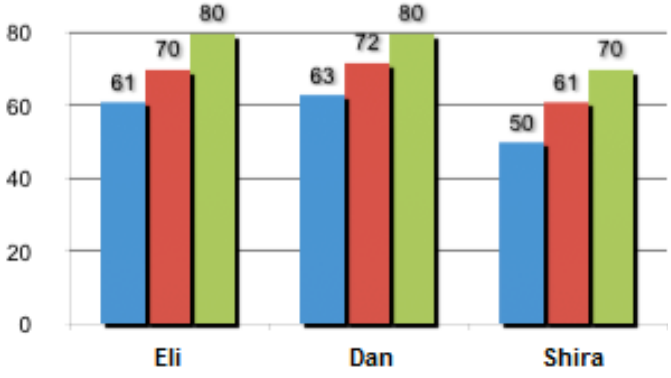
Moreover, the superintendents expanded the focus of their work to all their schools. Three of the superintendents who had worked as a team in one local school initiated a follow-up of the pupils' progress and presented each child's progress in Hebrew and Mathematics (see Figure 1).

We identified a shift in student achievements and in teachers' teaching and learning, and we saw an organizational change in schools and in the district as a whole.

Boundary Practices

Student learning appeared to have improved through the use of four main routines that can

Figure 1: Comparative Performance Scores in Math—4th Grade (State-Mandated Achievement Test)



be considered boundary practices: (a) open classroom observations and documentation; (b) indicators and rubrics; (c) feedback conversations; and (d) the collaborative learning process.

Observations and Documentation. Observations and documentation in the classrooms served as catalysts for evidence-based programs, as one superintendent indicated:

> *I model an observation and I document the lesson and deliver feedback based on it. The principal observes me and learns. The awareness of the fact that we enter* [classrooms] *to observe the lessons has already generated change. Moreover, the esprit de corps of the participants has also changed. The data collected help us to reflect about the lesson plan and to adapt it to the children' needs and their capacities* (bimonthly meeting, October 2, 2008).

The district head and the superintendents did indeed deliver a powerful and unequivocal message that data was the main element of the district agenda, and it was incumbent upon everyone to collect data in order to improve practice. Programs and styles of teaching and learning were changed in the light of data analysis based on multiple observations and multiple analyses. The teachers' plans were more appropriate and thoughtful, and suited the context features.

Indicators and Rubrics. The need to develop indicators and rubrics emerged from a discussion about teachers' mediation and how to improve it:

> Jane (superintendent): *I treated the mediation in all my schools with all the principals at a systemic level. I am interested in achievements, and teachers are concerned about their mediation and their interactions with children. The principals and I deliver the same message of working collaboratively in order to create a psychological-pedagogical approach for teaching and learning, based on effective teacher mediation and a safe place that could promote the children's development and meaningful learning. But, what is effective mediation and how can I evaluate it?* (meeting, March 1, 2009).

In the common meetings, the participants learned about teachers' mediation and how to evaluate it. They read literature about the issue and chose domains, skills, values, and attitudes to be evaluated. Superintendents and principals worked together. They defined proficiency levels and developed useful tools that served both as guidelines for qualitative discourse and as alternative ways for evaluating it.

Feedback Conversations. Teachers' interactions with individuals or with small groups and their feedback conversations recorded according to indicators and rubrics became routine in schools. The researchers analyzed the superintendents' interventions in the schools from a critical theory-based point of view in order to provide feedback. Key questions concerning the connection between instruction and learning in small groups were raised. The focus shifted from managing classes to meaningful learning. The participants realized that if a teacher, principal, or superintendent was supposed to improve pupils' learning and achievements, they had to model such learning. Thus, the focal points they raised, questions they asked, and their methods of analyzing the superintendents' practice served as lenses for their own critical examination and provided feedback about the superintendents' work.

The Collaborative Learning Process. Perhaps the most significant boundary practice coming from this program was the creation of a collaborative learning process, an innovative and interactive model for the supervisors' interventions that empowered the participants to identify their concerns, plan an action, see the effects of their action, generalize in order to understand the principle of the instance, and

plan new action. Moreover, this model constituted a continuous open-ended learning spiral, shaping the participants' professional development. This process consisted of the following phases: (a) observations and data collection; (b) data analysis; (c) collaborative problem posing and reframing issues; (d) collaborative planning of the program; (e) priority setting based on the identification of affordances and constraints; (f) program implementation in schools; and (g) program evaluation and the attendant modifications.

Interacting with Regard to Instructional Issues

The superintendents had an opportunity to interact with regard to instructional issues, learn from the data, and relate practice to theory. The understanding of their observations informed the dialogue in the community and enabled the discussion of instructional issues with colleagues. Thus, while analyzing the data from the classrooms, the superintendents noticed that

> *...in small groups, the teachers taught exactly as they were used to doing in a frontal lesson. … A small group enables* [the teacher] *to flow with the children, but a teacher comes unprepared, and instead of bringing about the growth of the group via the materials they create, this does not happen* (bimonthly meeting, January 29, 2009).

The data analysis led to dissatisfaction with what was occurring inside the classrooms underscoring their decision to

> *...identify one child and challenge the teachers to succeed with him. We* [the superintendents] *have set ourselves a goal of dealing with this issue* [teaching and learning in small groups] *in order to improve the quality of teaching in the classrooms* (bimonthly meeting, April 1, 2009).

Even though the issue of conducting a learning discourse in a small group and with an individual child became national policy, it bothered the superintendents, and it bothered the teachers and principals as well. This convinced them to learn and try out innovative strategies in their collaborative work in schools.

Working Collaboratively in Professional Teams

The collaborative work constituted a radical shift in the routines of the superintendents, who had been used to working in isolation. One of them commented:

> *We get a great deal from our collaborative work as superintendents: the three of us are learning, trying, experimenting, and creating in the climate of a small community. I can say that this collaboration has improved my work. You know that you are not alone; you can effect change working with others* (bimonthly meeting, March 3, 2009).

Analyzing the Practice in the Light of Theoretical Literature

The fact that the superintendents were analyzing their practice in the light of current theoretical literature was novel in their professional community; as one of them indicated:

> *One of the most significant things we experience is to examine what we have learned about our everyday work. For me it made a difference—something that I have to implement here exists in the theoretical learning. It's organized; we learn what happens in the world. I can't understand how we didn't do it before* (bimonthly meeting, March 3, 2009).

Examining their practice in the light of relevant theories and reflecting on it collaboratively with their colleagues encouraged the superintendents to continuously revise their programs.

Re-planning Their Collaborative Program

While focusing on pedagogy and conducting observations in the classrooms, the superintendents could map the big picture of the

school context. Collaboratively, they planned their intervention strategies and modified them periodically. Moreover, occasionally they paused to evaluate their programs and get feedback from the teachers and principals inside the school and from their colleagues in the professional community. One of the superintendents told the group how significant this routine was to him:

> *The most meaningful routines for me were the observations in the classrooms, the documentation, the feedback, and taking part in the instruction in the classrooms. Particularly important were the parallel processes going on among the learning communities of the school, principals, and the superintendents. Everyone was doing the same thing, which eliminated the traditional gap between the instruction going on in the classroom and the conversation with the superintendent outside of the classroom* (bimonthly meeting, March 3, 2009).

Mutual Learning and Reflection

Parallel to the superintendents' time-out to reflect on and evaluate their work, the researchers also met periodically with the district head in order to get feedback from the participants and to review the theoretical learning, the visits to schools, and the superintendents' presentations. The researchers' meetings aimed at evaluating the process, discussing critical issues and conflicts, and promoting the community's continuous learning. Thus, all the participants were teachers, learners, and leaders simultaneously. All of them experienced collaborative learning in and among communities and created a distributive leadership model throughout the entire district.

Inter-Institutional Collaboration

The participants implemented many of the suggestions and transferred them into policy. In line with national reform, teaching small groups and individual pupils was instituted throughout the district. Based on the empirical data, the district head allocated supplemental hours for working in small groups. In partnership schools, the superintendents and principals enhanced collaboration with the college and involved students and trainees in this new policy. As a result, all the pupils worked in small groups in more than half of their lessons. Changes also were introduced in the teacher education programs at the college, such as learning in small groups, teacher mediation, and emergent curricula based on pupils' interests.

Discussion

After three years of intensive collaboration, the underperforming schools showed improvement and achievements in the core disciplines and in climate criteria. For example, in 2008, in seven elementary schools located in one town, 63 percent of the pupils indicated positive general feelings toward school as compared to 70 percent nationally. In 2009, 75 percent of the pupils in this town indicated positive general feelings toward school versus 70 percent nationally. In 2008, 50 percent of the pupils in this town thought that there were caring relationships between pupils and teachers versus 46 percent nationally, while in 2009, 66 percent of the pupils thought that there were caring relationships versus 45 percent nationally. Due to space constraints, data regarding improvement in learning achievements will not be presented, but it is evident that throughout this partnership the district head achieved the aims that triggered this collaboration.

However, this project went beyond concrete outcomes and focused on practices of participation alongside diversity. Regarding the research question, the study shows that dealing with differences through the lens of multiple communities, the participants reflected on their concerns, gained insights, coordinated their efforts, and transformed their practices, creating new interpretations of their roles, changing their ways of acting, and leading innovations in schools and in the college. The study explains this process using the

theoretical terms *boundary practices* and *boundary objects*.

First and foremost, the study shows transformation in the superintendents' perceptions of their roles as well as a change in the culture of the district.

At the beginning of the collaboration, the superintendents did not take responsibility for the low scores in schools. They considered themselves external administrators of student testing. Even when the use of data and measures as boundary objects created a common syntax, the development of a common context and the production of new knowledge did not occur. Moreover, the use of data and measures as boundary objects reflected their conception of their school-related mission: gathering and disseminating information, budgeting, scheduling, and criticizing the capabilities of the principals to improve the quality of the learning in their schools.

The superintendents' use of standardized forms and methods at the beginning of our second year aimed to fulfill the requirements of the bureaucratic paperwork. The researchers noted that by working with the annual plan, teachers and principals were simply following instructions. Thus, their professional contacts were limited, and the annual plan served as a boundary object in the context of hierarchical relationships characterized by assessment rather than assistance and by coordination rather than collaboration.

At the end of the second year of the inter-institutional collaboration, the concept of the individual child emerged as a boundary object and promoted the formulation of learning as an ongoing process focused on the child rather than teaching focused on narrow goals. The focus on the child encouraged the development of a range of routines as well as a shift from assessment as an isolated activity to assistance and reflection as inherent parts of the teaching and learning process in schools and in the district.

The conversations that centered on the concept of the individual child as a boundary object facilitated a process in which participants jointly transformed their knowledge of learning and teaching. The superintendents conducted the learning process in the community concurrently with their work in the schools. The use of a concept as a boundary object was a source of innovation, learning, and knowledge transformation. The superintendents' use of this boundary object as a bridge between the communities facilitated collaboration and alignment of perspectives and meanings.

The study shows that the combination of the use of boundary concepts and boundary practices in our discourse began to shape a new organizational culture in the boundary zone, characterized by several shifts: from demanding that the principals be responsible for pupil learning to sharing the commitment with them; from inspecting procedures outside of the classrooms to observing instruction within them; from isolated work to collaborative learning; from using intuitive and diffuse language to using clear, professional, and mutually agreed upon language anchored in the research literature; and from a local, fragmented, and closed work environment to an integrated, connected, and open one.

The framework presented in this study is radically different from the partnership literature in many aspects. Most of the traditional partnerships examine collaboration between a teacher education institution and schools, where the superintendents occasionally are full partners and occasionally not. In this study, the focus was on the superintendents as learners and leaders who, while changing their roles, also served as change agents generating change in an entire district culture. They rearticulated their roles, experienced collaborative learning and leadership with colleagues and principals, and co-led reform by shifting the focus from planning and evaluating into working together and practicing these new capacities (Margolin, 2012).

As a consequence of the inter-institutional collaboration, the college transformed its teacher education program, enhanced partnerships with schools, and took an active part in the new programs for individualized learning. The two teacher educator-researchers visited

schools and gave feedback, seeing these new roles as an integral part of their mission. The superintendents observed classes, documented the processes, and decided on new policies based on the data. However, at present, this new knowledge has not transformed into public knowledge. This is the vision for the future of this professional learning community.

This study demonstrates that fostering leadership and encouraging educational change are complex enterprises which should enlist the combined efforts of district administrators, principals, teachers, and academic researchers. Based on the assumption that such a project should be conducted by the participants themselves, the study shows the importance of a committed professional learning community and of collaboration among different entities and communities. Furthermore, the terms boundary practices and boundary objects can become useful tools to cross the boundaries, deal with differences, and challenge complex practices. It is hoped that the findings of this study will offer insights and contribute to extending theory and improving practice regarding collaborative learning and inter-institutional collaboration that promotes leadership and educational change.

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Appendix A: Observation Form (for one child)

Date:
Context:

What did I think? What did I feel?	What did I see? What did I hear?	Hour

What did you learn about how this pupil thinks and learns?

- What questions about teaching and assessment did looking at this pupil's work raise for you?
- How can you pursue these questions further?
- Are there things you would like to try in your classroom as a result of looking at the pupil's work?

Appendix B: Indicators (index) for Assessing the Learning Discourse in a Small Group

Criteria	
Discourse characterization	"Talks" to the interlocutor
	Invites active listening
	Creates involvement of the interlocutor: objection and/or agreement and support
	Enables elaboration and granting new meaning to the talk
	The meaning is determined by the speaker
	The meaning is determined by the listener as well as by the speaker
	There is a rich interaction
	The discourse expresses various voices, views, and positions
	Encourages asking questions by all interlocutors
The teacher's role in the discourse	Broadens children's sayings by asking for clarification, explanation, or reasoning
	Supports equal distribution of speech
	Formulates the conclusions
	Restrains the discourse development
	Gives feedback (relating to substance and activity)
	Links between the children's talk and similar events, other texts, familiar concepts, and former knowledge
	Creates a situation for free conversation and dialogic discourse among the children and between them and the teacher
	Expects a given answer
	Ignores responses
Child's responsibility in the discourse	Integrates in the discourse
	Is passive
	Ratifies the teacher's words
	Criticizes the teacher's sayings or resists them
	Gives responses
	Initiates and leads
	Explains, gives reasons, claims, or litigates
	Listens to others in an appropriate way and responds to them
	Duplicates ideas
The discourse and the discipline	Use of language to understand disciplinary thinking embodied in the disciplinary research methods and aims
	Uses language that develops thinking in the discipline
	Accurate use of concepts belonging to the discipline
Language	Proper language
	Broad and diverse vocabulary
	Clarity
	Concept accuracy
Structure of participation	The discourse represents idea development, conceptualization, inclusion, abstraction, and drawing conclusions.

	The discourse pattern is IRE sequence: teacher's initiation, student's response, and teacher's evaluation.
	The conversation does not flow
	Children respond to the teacher's stimulus
	Children initiate the discourse
	The discourse is a collection of isolated answers
Discourse organization	Logical organization coefficients of the discourse: - Induction or deduction - Cause and effect - Analogy - Problem and solution - Detailing and explanation