

Principals' Learning Mechanisms: Exploring an Emerging Construct

Abstract

Background: Research over the last couple of decades has consistently shown that school principals are powerful players who can affect school improvement and bring about change. Given the challenges posed by policy accountability mandates, school principals are required to lead through continuous learning, which enables them to thrive in an uncertain educational environment.

Purpose: This study explored the notion of principal learning mechanisms (PLM) and developed a suitable measure for elementary school principals. More specifically, the purpose of the study was two-fold: (a) to develop and field-test an instrument designed to measure PLM; and (b) to determine the PLM instrument's validity and reliability.

Design: A pilot study comprising principals from elementary schools was conducted. Then, both exploratory and confirmatory factor analyses of items were conducted to examine factorial validity. To test the criterion-related validity, the developed scale was correlated with other established constructs, such as principal's instructional leadership, and teacher's organizational commitment.

Findings: A four-factor model of PLMs in elementary schools was the best fit between the empirical results and the conceptual formulation. The four-factor model included the following factors: (a) Storing and retrieving information, (b) Receiving information (from students, parents, community, and superiors), (c) Disseminating information for teachers, and (d) Analyzing external and internal information.

Implications: Using the PLM instrument, principals will be able to assess their learning mechanisms cycle. Principals may become more knowledgeable about which learning dimension (e.g., analyzing information; storing information; disseminating information)

requires improvement. Beyond being an assessment tool for individual school principals, this instrument can also be used to deliberate about ways used to create collective learning within and among schools.

Keywords: organizational learning; organizational learning mechanisms, principal learning mechanisms; elementary schools; instructional leadership; organizational commitment

Empirical paper

Introduction

Research over the last couple of decades has consistently shown that school principals are powerful players who can affect school improvement and bring about change (Davis, Darling-Hammond, LaPointe, & Meyerson, 2005; Desjardins & Donaldson, 2008; Drago-Severson & Pinto, 2009; Leithwood, Louis, Anderson, & Wahlstrom, 2004; Author, 2005; Waters & Grubb, 2004). Given the extent of the reforms that have beset educational institutions and the ongoing challenges brought about through globalization, technology, and the marketization of education, it is also incumbent on school leaders themselves to become reflective, lifelong learners who are open to learning and growth and who are able to facilitate the learning and growth of both staff and students (Browne-Ferrigno, 2007; Fullan, 2009; Murphy, 2006). It appears that today's school leadership should be grounded in developing teaching and learning capacities and in the implementation of effective organizational learning structures and processes (Davis et al., 2005). In other words, school leadership needs to focus on teaching and learning issues (Orr, 2006) through generating collective learning opportunities for all faculty and students.

Given the complex socio-cultural milieu in which school principals now work and the challenges posed by policy accountability reforms, principals require new sets of skills and competencies to enable them to thrive in this uncertain educational environment (e.g., Darling-Hammond, LaPointe, Meyerson, Orr, & Cohen, 2007; Drago-Severson, 2009). Thus, this study developed an instrument to measure Principal Learning Mechanisms (PLM) in elementary schools through the information processing perspective, which focuses on gathering and assimilating information from both internal (organizational) experiences and external (environmental) changes. PLM entails the existence of principals' structural and procedural arrangements for collecting, analyzing, storing, disseminating, retrieving, and using information that is relevant to the performance of the school and its members. The

purpose of the study was two-fold: (a) To develop and field-test an instrument designed to measure PLM; and (b) To determine the new PLM instrument's validity and reliability. Based on the above rationale and purpose, we raised the following questions: (1) Which dimensions of PLM characterize elementary school principals, based on the information-processing perspective? (2) How do the dimensions of the developed PLM questionnaire correlate with constructs that predict school productivity – principal's instructional leadership and teacher's organizational commitment?

This article begins with a description of the Israeli elementary-school research context, followed by the theoretical framework that guides the study. We then describe our development of the PLM questionnaire, including its item development, exploratory analysis, and confirmatory analysis. To establish validity, we examined the developed questionnaire's correlations with the well-established constructs of principal's instructional leadership and teacher's organizational commitment, which have emerged as significant factors in school productivity (e.g., Bryk, Sebring, Allensworth, Luppescu, & Easton 2009; Author, 2012; Shapira & Rosenblatt, 2009). After describing the research methodology and results, the value and utility of this questionnaire in today's public school leadership is discussed and future research avenues are suggested.

Research Context

The Israeli educational system has been traditionally highly centralized both structurally and procedurally. The Ministry of Education has controlled schools in areas such as writing and distribution of curriculum materials, standards, testing, and hiring and firing of school staff. Schools have followed a basic national curriculum although allowed to conduct “experiments” under administrative direction from the Ministry. However, in recent years, the tendency toward neo-liberal ideas of competition and privatization has resulted in more open and flexible registration opportunities for urban schools (with weaker links between

residential location and school attendance zones). These processes (open enrollment zones, school choices, increased strength of local education authorities in municipalities) have transpired much more in the urban schools, which operate in a competitive environment, whereas suburban and rural schools operate in a less competitive environment. This tendency toward flexible registration opportunities has been coupled with attempts to decentralize the school system through efforts such as school-based management, autonomous schools, and so forth (Nir, 2006). Although enabling school autonomy is a declared policy of the Ministry of Education, principals are still hesitant to undertake professional autonomy due to the Ministry's attempt to retain a strong centralized control system in operation, generally perceived by principals as bounded autonomy (Inbar, 2009).

In 2007, the Israeli Ministry of Education launched a national reform program in primary schools known as "New Horizons" (Ofek Hadash). The "New Horizons" reform, which involves a significant salary increase for teachers, is intended to raise student achievement levels, improve school climate, and provide equal opportunities for all students. It was the first time that the introduced reform was followed by an extensive negotiation between representatives of the Ministry of Education and representatives of the Teachers' Union in primary education. The design of the program is focused on the formation of "small-group" learning formats in which teachers work with small groups of students on a daily basis. Complementing the "small-group" format, schools are provided with additional resources for professional development that are intended to prepare teachers to work effectively within the small group format. To this end, teachers' professional development process should be structured and systematic, facilitating the development of accountability and professional commitment (Glickman, Lipshtat, Raz, & Ratner, 2011). The New Horizons reform is currently undergoing the process of implementation.

Conceptual Framework

The conceptual framework for this study is grounded in the literature concerning the principal as a learning leader and the literature concerning learning mechanisms. These literatures are described below.

The Principal as a Learning Leader

Over the last decade, there is a growing interest in learning and learning improvement as the greatest concern of school leaders. The "learning-focused leadership" (Knapp & Feldman, 2012) or "learning-centered leadership" (Murphy, 2006) relates to leaders' contribution to students, professionals, and systems' learning. The learning leader focuses on collective learning processes and developing a school-wide learning improvement agenda (Knapp & Copland, 2006). Ash and Persall (2000) describe the principal as a chief learning officer who must create an environment that supports collaboration among teachers, provides time for teachers' professional development, and recognizes, rewards and celebrates the concept of teachers as leaders. To accomplish this, the principal needs to ensure the transmission of knowledge among members of the faculty and staff. Thus, the principal's challenge is to provide new information and opportunities for collaborative planning and learning and to build an organizational climate that encourages and supports leadership throughout the school (see also, McGough, 2003). Leaders are accountable for arranging the interactive social environment and ensuring that adequate resources are available to support teacher learning (e.g., Halverson, Grigg, Prichett, & Thomas, 2005).

It was suggested by Murphy, Manning, and Walberg (2002) that in order to build capacity for collaboration, educational leaders may redefine collaboration to include specific knowledge about working together that can be learned. With that knowledge, leaders can work to bring together different groups involved in education, to achieve specific research-based objectives. Leaders need to be capable of building strong professional communities that can foster teacher collaboration, dialogue, and learning (Fullan, 2009). Establishing such

communities requires that principals become collective instructional leaders guiding the development of school learning improvement that, while based on methodical research, is tailored to school contexts.

While responding to social and political pressures, leaders need to buffer staff from counterproductive policies, build school-improvement initiatives that address external reforms, and meet the needs of the school's students and community. Principals can develop ongoing learning in school despite distracting social, political, and economic forces. They can work with school community members to assess what they collectively believe makes their schools successful beyond the limits of accountability measures (Kochan, Bredeson, & Riehl, 2002). In this regard, learning leaders treat the external environment as opportunities for learning improvement as well as looking inward to develop professional learning communities (Knapp & Feldman, 2012). Thus, although policymakers underestimate resources for professional learning, accountability leaders need to create a culture of individual and collective learning in schools (Desjardins & Donaldson, 2008; Drago-Severson & Pinto 2009; Schlechty, 2009).

Learning Mechanisms

The structural-social approach to learning from an information processing perspective entails the existence of learning mechanisms, which are institutionalized structural and procedural arrangements for collecting, analyzing, storing, disseminating, retrieving, and using information that is relevant to the performance of the principal and the school (Lipshitz, Popper, & Friedman, 2002). Learning mechanisms are concrete social arenas where knowledge can be analyzed and shared by individual members and then become the property of the school through dissemination and changes in standard routines and procedures.

These structural-social mechanisms generally focus on five phases of the information-processing (learning) cycle (Easterby-Smith, 1997): organizational memory and information

acquisition, distribution, retrieval, and interpretation. Despite the following consecutive list of phases, learning is perceived as cyclical, dynamic, and interactive processes.

Organizational memory. This phase of information processing refers to the repository where information is stored for future use. The processes and means by which organizational experiences are stored and coded into organizational memory consist of both mental artifacts (e.g., stories that represent an organization's cultural patterns and values) and structural-technological artifacts (e.g., resource room, written policies, dress, furniture, operating procedures) within an organization (Kruse, 2003; Weick, 2000). Organizational memory includes hard data such as numbers, facts, figures, and rules as well as soft information such as tacit knowledge, expertise, experiences, anecdotes, critical incidents, stories, artifacts, and details about strategic decisions.

Organizational memory can be described as either organic or constructed (Johnston, 1998). Organic memory includes the memories of individual members of the organization, the embedded memory resulting from organizational culture, standard operating procedures, expected role behaviors, and environmental factors. Constructed memory consists of knowledge stored in facilities deliberately designed and maintained for purposes of organizational memory. Such facilities include electronic databases, transaction records, and historic archives. It seems likely that organizational learning increases when more people have greater access to organizational memory. Also, as more people can potentially update an organizational memory themselves, even greater potential for organizational learning exists (Goodman & Darr, 1998). School memory includes educational publications, procedures, work programs, protocols, instructions, exams, worksheets, and so on. The information gathered and stored in the school memory base enables staff to browse subjects at any time, thus improving their activities. This may help schools make appropriate strategic decisions and adapt to changing realities of daily school life (Author, 2012; Ozer, 2006).

Information acquisition. The process of obtaining knowledge includes experiential learning (organizational experiments and organizational self-appraisal, such as action research), vicarious learning (e.g., external alliances, through which organizations attempt to learn from other organizations' strategies and technologies), grafting-recruiting new members (who possess knowledge that is not available to the organization), and searching and observing the environment (e.g., scanning units). Knowledge acquisition is achieved by monitoring the environment, using information systems to store, manage, and retrieve information, carrying out research and development, carrying out education and training, patent watching, and using bibliometrics (Dodgson, 1993). Organizations can use exterior and interior activities to acquire knowledge, such as rearranging existing knowledge, revising previous knowledge structures, and building and revising theories. Thus, organizations acquire knowledge through competitive intelligence units (which collect information on other organizations), by searching the environment, and by hiring new personnel (grafting).

Information distribution. This phase of the information-processing cycle refers to the sharing of information that leads to understanding, which then produces new knowledge in the form of tacit know-how, letters, memos, informal conversations, and reports. In addition to traditional forms of information distribution such as telephone, facsimile, face-to-face meetings, and memoranda, there are computer-mediated communication systems such as electronic mail, bulletin boards, computerized conferencing systems, electronic meeting systems, document delivery systems, and workflow management systems. Moreover, learning in an organization takes place by members' sharing of stories or anecdotes of actual work practice. Greater sharing or distribution of information leads to greater learning and can also lead to the creation of new knowledge (Argote, McEvily, & Reagans, 2003). Although sharing information and ideas of internal members and external facilitators can enhance school outcomes, the constraining factors tend to cluster around norms of privacy, isolation,

and individualism (Collinson & Cook, 2007).

Information retrieval from memory for organizational use. Organization members draw on the encoded information to guide their decisions and actions (Kruse, 2003). Effective use of data by school personnel has become a central tenet in school improvement processes like increasing test scores, reducing achievement gaps, and changing school culture (Wayman, Brewer, & Stringfield, 2009). Research has indicated that schools operating within competitive and high-stakes accountability systems are more involved in data-driven decision-making processes than schools that do not operate within such systems (Marsh, Pane, & Hamilton, 2006). Research findings have linked data use to changes in school culture and teacher practices leading to better student performance (Dantow, Park, & Wohlstetter, 2007; Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006). However, literature on the practice of data use demonstrates a range of ways in which information processing may fail to have the effect intended by school leaders (e.g., Diamond & Spillane, 2004). Concurrently, although scholars note the importance of teachers' expertise in using data to inform actions, teachers' ability to apply data has been described as inadequate (e.g., Wayman et al., 2009).

Information interpretation. In this socio-cognitive process, the distributed information is given one or more commonly understood meanings. This occurs when organizations undertake sense-making and information-interpretation activities. Individuals and groups possess belief structures that shape their interpretation of information and thus the formation of meaning (Huber, 1991). These belief structures are stored as a profile, which is automatically applied to any incoming information in order to form meaningful knowledge that can be stored. Greater learning occurs when varied interpretations are developed. Consequently, organization members decide whether or not to incorporate the incoming information into organizational routines. This exchange of views and attitudes can transfer individuals' tacit knowledge into organizational knowledge and assist in verifying, sorting,

and filtering data from both inside and outside the organization (Nonaka & Takeuchi, 1995).

According to Zollo and Winter (2002), information can also be interpreted through knowledge articulation, a process in which implicit knowledge is articulated through collective discussions, debriefing sessions, and performance evaluation processes. By sharing their individual experiences and comparing their opinions with those of their colleagues, organization members can achieve an improved level of understanding of the causal mechanisms intervening between the actions required to execute a certain task and the performance outcomes produced.

In elementary schools, the extent of learning mechanisms was significantly and positively related to teachers' sense of collective efficacy and to their commitment to their schools, but was significantly and negatively related to teachers' sense of environmental uncertainty (Author, 2008). In one study (Kurland, Peretz, & Hertz-Lazarovitz, 2010), mediating regression analysis demonstrated that the school vision was a significant predictor of faculty's learning mechanisms (the information-processing framework) and functioned as a partial mediator between principals' transformational leadership style and faculty's learning mechanisms. Moreover, Author and Colleague (2012b) found a negative relationship between principals' sense of environmental uncertainty and the extensiveness of learning mechanisms in schools. This resembled findings from the business sector, where a greater intensity of learning mechanisms' use correlated with managers' lower feelings of environmental uncertainty (Ellis & Shpilberg, 2003).

Elementary teachers working in urban schools (a turbulent environment) perceived more extensive use of learning mechanisms than staff members in the more placid environment of suburban schools (Author, 2007). Similar findings were reported by Klein (2000), indicating that secondary schools in a highly competitive environment used learning mechanisms more extensively than those in a less competitive environment. Furthermore,

learning mechanisms (focusing on storing, retrieving, and utilizing information) served as a prominent mediating variable between teachers' perceived environmental uncertainty in urban elementary schools and teachers' sense of collective efficacy, but not in the suburban schools (Author & Colleague, 2012a).

These empirical studies suggest that school learning mechanisms not only alter operational structures, procedures, and routines but also may facilitate changes in important social organizational attributes (e.g., collective efficacy, organizational commitment). Expanding on knowledge gained from the development of the OLM (organizational learning mechanisms) questionnaire for elementary school faculty (Author, 2008), it was important to develop and field test an instrument to measure principal learning mechanisms and to determine its validity and reliability among elementary-school principals.

The Principal Learning Mechanisms Questionnaire – Research Design

The development of the principal learning mechanisms (PLM) scale involved several phases – developing items based on the information processing perspective, conducting a pilot study, employing both exploratory and confirmatory factor analyses to refine the subscales and to assess the factorial validity, and testing the developed PLM scale with other known constructs (instructional leadership, organizational commitment). These phases are described below.

Item Development and Pilot Study

The study began with an attempt to develop empirical indicators, formulated for elementary school principals to describe the extent to which they use learning mechanisms (acquire, analyze, disseminate, store, retrieve, and put information to use). We conducted 10 in-depth interviews with veteran elementary-school principals from different educational districts (lasting 30 min. each). Interviewees were asked to evaluate each of the PLM questionnaire items' applicability to elementary school principals and to generate new items.

Participants were asked to provide information regarding the gamut of elementary principals' learning characteristics. Based on the aforementioned procedure, a draft version of PLM questionnaire was devised.

Next, a pilot study comprising 60 elementary school principals was conducted. Sampled principals were drawn from a list of Israeli elementary school principals. Principals' comments with regard to PLM's item clarity as well as suggestions for modifying, adding, and deleting items were considered. Thus, items were checked for clarity, phrasing, and relevance to their respective content domains. Principals were also asked to check the appropriateness of the response scale. The aforementioned steps yielded a PLM questionnaire that contained 25 descriptive statements to be rated along a 5-point Likert-type response scale, ranging from *does not exist* (1) to *exist extensively* (5).

Exploratory Factor Analysis

Exploratory factor analyses (EFA) were conducted to map the domain of the construct and refine the measure and meaning of PLM. EFA is used to explore the number of factors that account for the co-variation between variables when there is no a priori sufficient evidence to form a hypothesis about the number of factors underlying the data (Stevens, 1996). To explore the factor structure, 230 elementary school principals were randomly sampled from a list of Israeli elementary school principals to respond to the 25 items of the PLM questionnaire. Data was collected by a research staff member. The study purpose was explained, anonymity was guaranteed, and the importance of candid responses was stressed.

Exploratory factor analysis of the item matrix was performed to study which items clustered together and which did not. For this purpose, a principal-axis factor analysis, rotated using Kaiser's (1958) varimax criterion, was used to examine the 25-item measure. Items that loaded high on one factor and relatively low on all the others were retained, whereas items with low loadings (a cutoff of .49 was used to interpret the rotated solution) and/or dual

factor loadings were either discarded or revised. Deletion decisions were based on the interaction between the conceptual formulation and the empirical factor loadings, retaining items only when clearly related to the measured concept. Moreover, we deleted items that substantially reduced factors' internal consistency (Cronbach's coefficient alpha). Deleted items included: "I maintain an accessible and up-to-date information archive"; "I enlist the help of external consultants to analyze school events"; and "I maintain orderly information files on various subjects." Based on the aforementioned procedure, 3 items were eliminated, producing a 22-item questionnaire.

The analytical process of exploring the factor structure was repeated until a preliminary questionnaire with both conceptual meaning and reasonable measurement characteristics was achieved, which explained more than 50% of the total variance and more than 5% of the variance for each factor. Items were assigned to factors without setting a number of factor criteria, and this assignment was coupled with repeated procedures of specifying factor criteria. Once these empirical procedures were completed, results were compared. Despite the PLM dimensions' strong conceptual interdependence and interrelatedness, four strong latent factors that had content validity and discriminatory potential were identified as the better fit between the empirical results and the conceptual formulation. The 22-item PLM questionnaire consisted of four factors, explaining 55.88% of the variance.

The repeated analytic procedures on the initial PLM questionnaire resulted in 22 items grouped in four relatively strong factors, as seen in Table 1, with four distinct clusters of items and moderate to high reliability coefficients (Cronbach's alpha): (a) Storing and retrieving information (5 items, .93); (b) Receiving information (from students, parents, community, and superiors) (8 items, .86); (c) Disseminating information for teachers (4 items, .75); and (d) Analyzing external and internal information (5 items, .80). The reliability coefficient for the questionnaire as a whole (22 items) was .90, indicating a high internal

consistency.

Confirmatory Factor Analysis

A separate new random sample was drawn of 215 elementary school principals in Israel's five school districts: north, Haifa, Jerusalem, central and Tel-Aviv. The questionnaire was administered to principals at urban, suburban, and rural schools having at least 13 faculty members. These schools represented the entire socioeconomic range. Typically, data were collected by a research staff member. The study purpose was explained in general terms, anonymity was guaranteed, and the importance of candid responses was stressed.

Guided by the results of the exploratory factor analysis, a confirmatory factor analysis (CFA) was employed. The confirmatory procedure used structural equation modeling software, AMOS 20, to test the model derived from the EFA and other possible models of the PLM construct. Amos output was generated for the following four models: (1) The *one-factor model* was generated because information processing is a cyclical, dynamic, and interactive concept, calling for inquiry into whether PLMs are better depicted as a unidimensional or multifaceted construct. (2) The *three-factor model*. (3) The *four-factor model* derived from the exploratory analysis. (4) The *five-factor model* was based on the five information-processing phases (organizational memory, information acquisition, distribution, retrieval, and interpretation) as described in the conceptual framework.

Fit indices provide feedback about the appropriateness of the model derived from Amos based on the covariance structure of the observed data. Confirmatory factor analysis results clearly indicated that the one-factor model was not a good fit for the data and that the four-factor model had better fit indices compared to the three-factor and five-factor models (see Table 2). Analysis of the four-factor model yielded a sound fit for the data, with all indices at or near the levels proposed for a good model (Joreskog & Sorbom, 1989). Moreover, when compared with the exploratory factor analysis, the confirmatory factor

analysis procedure generated similar empirical evidence of the measure's underlying factor structure (Cramer, 2000; Kerlinger, 1986).

Table 3 presents operational definitions of the factors that form the final PLM construct for elementary schools, resulting in 22 items which are listed in descending order, according to their strength of loadings on each factor. Table 4 presents the range of factor loadings, descriptive statistics, alpha coefficients, inter-item correlations, and correlation analysis for the four-factor model of PLMs. The repeated analytic procedures on the final PLM questionnaire (22 items) yielded four relatively strong factors, as seen in Table 4, with four distinct clusters of items and moderate to high reliability coefficients (Cronbach's alpha): (a) Storing and retrieving information (5 items, .80); (b) Receiving information (from students, parents, community, and superiors) (8 items, .85); (c) Disseminating information for teachers (5 items, .82); and (d) Analyzing external and internal information (4 items, .80). The reliability coefficient for the questionnaire as a whole (22 items) was .88, indicating a high internal consistency.

The results reveal several insights. First, the disseminating information factor for teachers, which refers to principals' processes for providing school personnel with information to be collectively analyzed, showed the highest mean score ($M = 4.47$). The lowest factor mean was storing and retrieving information ($M = 3.79$), which pertained to the processes and means by which information is disseminated by school principal to faculty members and stored in school memory for future use. Second, the review of the internal consistency coefficients for the latent factors indicated moderate to excellent results (ranging from .58 to .80). The total questionnaire (22 items) demonstrated a reliability of .93. Inter-item correlations ranged from .199 to .618, suggesting that the PLM items represent a broad variety of characteristics for each factor instead of overly similar items (Kivimaki et al., 1997). Third, the correlation matrix for the four-factor model indicated relatively moderate

degrees of association between the latent factors. These values are appropriate for models that have proposed a priori that the latent factors (dimensions) are theoretically interrelated (Brew et al., 2004).

Principal Learning Mechanisms and Validity Variables

To test the criterion-related validity, we examined the PLM questionnaire's correlations with two other well-established constructs: instructional leadership, and organizational commitment. Because information processing is a cyclical, dynamic, and interactive concept, both the four-factor model (best fit with data) and the whole questionnaire were correlated to validity criteria.

Validity using instructional leadership. Validity for the PLM questionnaire was measured using a survey of instructional leadership (Berger, 2010), presumed to relate positively to the extent of PLMs. Hallinger's (2003) most frequently used conceptualization of instructional leadership proposes three dimensions: defining the school's mission, managing the instructional program, and promoting a positive school-learning climate. Hallinger further outlines functions of an instructional leader. These functions include: framing and communicating school goals; supervising and evaluating instruction; coordinating curriculum; developing high academic standards and expectations; monitoring student progress; promoting the professional development of teachers; protecting instructional time; and developing incentives for students and teachers.

In order to promote their core responsibility of promoting effective teaching and learning, principals need to concentrate on being strategic about employing shared instructional leadership (Mestry, Moonsammy-Koopasammy, & Schmidt 2014). Research has shown that the very essence of instructional leadership is to transform the school as an organization into an environment where teachers and learners may reach their full potential. There is a rising interest in investigating the importance of instructional leadership as a means

for fostering sustainable teaching and learning in schools (Bryk, et al., 2009; Louis, Dretzkea, & Wahlstrom 2010). Kelley, Thornton, and Daugherty's (2005) study of instructional leadership found that schools with positive climates have principals who promote effective feedback, envision teacher needs, empower teachers to share the vision, and provide the foundation for an atmosphere conducive to learning and change.

We used Berger's Hebrew questionnaire (Berger, 2010), which was developed by measuring the functions that the principal as an instructional leader must fulfill, according to Hallinger and Murphy's measure (1985). For this purpose, Berger translated and developed a measure with 55 items into Hebrew and adapted them to the Israeli school context. According to Berger's results, the questionnaire measures the following dimensions: framing school goals ($\alpha=0.83$); communicating school goals ($\alpha=0.82$); supervising and evaluating instruction ($\alpha=0.78$); coordinating school curriculum ($\alpha=0.66$); monitoring student progress ($\alpha=0.83$); protecting instructional time ($\alpha=0.85$); maintaining high visibility ($\alpha=0.72$); developing incentives for teachers ($\alpha=0.81$); promoting the professional development of teachers ($\alpha=0.86$); formulating and enforcing educational standards ($\alpha=0.61$); developing incentives for students ($\alpha=0.73$). Answers range from 1 (never) to 5 (always or very often).

Based on Berger's work (Berger, 2010), we decided to adapt the questionnaire to the elementary school level and reduce the number of items, while preserving the theoretical meaning of its components. The questionnaire was distributed to 500 elementary teachers. Based on factor analysis of items (using principal components extraction, varimax rotation), the questionnaire was reduced to 31 items. The reliabilities of the three factors in this questionnaire were: defining the school's mission ($\alpha=0.90$), example items: "Defines the responsibilities of the team in achieving the school's educational goals", "Evaluates teachers on reaching academic goals that are directly tied to school objectives" ; managing the instructional program ($\alpha=0.90$), example items: "Locates students whose exam results

indicate that they need tailored teaching methods”, “Clarifies who is responsible for coordinating the curricula”; and promoting a positive school-learning climate ($\alpha=0.94$), example items: “Dedicates time to talking with teachers and students during recess.”, “Praises students for high achievements through reinforcements such as prestigious roles or mentioning them in the school paper or site”.

Validity using organizational commitment. Validity for the PLM questionnaire was also measured using a survey of organizational commitment (Meyer & Allen, 1997), presumed to relate positively to the extent of PLMs. Organizational commitment has emerged as a leading construct in organizational research due to its relationship with important work-related concepts (Shapira & Rosenblatt, 2009). It is defined as "the relative strength of an individual's identification with and involvement in a particular organization" (Mowday, Steers, & Porter, 1979, p. 226) and as a bond linking the individual to the organization (Mathieu & Zajac, 1990). Growing evidence suggests that extensive use of collective learning mechanisms related to curriculum and instruction promotes greater teacher commitment (Author, 2008).

Meyer and Allen's (1997) widely-used 22-item survey of organizational commitment, which was specifically adjusted to suit educational settings (Shapira & Rosenblatt, 2009), has three subscales rated along a 5-point Likert-type scale ranging from *Strongly disagree* (1) to *Strongly agree* (5). Factor analysis of the 22 items (using principal components extraction, varimax rotation) yielded three factors: (1) Affective commitment refers to teachers' emotional attachment to the organization, identification with it, and involvement in it (8 items, $\alpha = .78$). Example item: “I have a strong feeling of belonging to this school”, “I feel an emotional connection to this school”. (2) Normative commitment reflects a feeling of obligation to continue employment (5 items, $\alpha = .70$). Example item: “Even if I had the opportunity, I don’t think it would be right to leave the school at this moment.”, “Too many

things would go wrong in my life if I decided to leave the school at this stage”. (3) Continuance commitment refers to teachers who remain in the organization because of their awareness of the cost associated with leaving (9 items $\alpha = .74$). Example item: “I would find it very difficult to leave the school right now, even if I wanted to”, “I would feel guilty if I left school now”. Cohen (2003) pointed out that in organizational-behavior literature; affective commitment has been more dominant in predicting other important work-related concepts than were the normative and continuance dimensions of organizational commitment.

Analysis of findings for the two validations constructs

A total of 2690 teachers from 215 elementary schools (a mean of 13 randomly selected teachers per school), whose principals provided data for the confirmatory analysis, responded to the research questionnaires. As the instructional leadership, and organizational commitment constructs reflect a specific school, the appropriate analytic focus was the school (Sirotnik, 1980), rather than the individual teacher. To confirm this theoretical assumption, we tested whether aggregation was appropriate using the rWG statistic (James, Demaree, & Wolf, 1993). Faculty members' perceptions of their work environment must coincide if a claim can be made that a construct constitutes an organizational-level variable (Bliese, 2000). An rWG value of .70 or greater was suggested as a sufficiently “good” amount of within-group inter-rater agreement (James et al., 1993). In the current study, all of the research instruments factors exceeded this level (see Table 5). These results provided sufficient statistical justification for aggregating individual responses into a school level score (see Bliese, 2000).

The within-group agreement was also evaluated by two measures. The interclass correlation coefficient 1 (ICC1) examines the within-group variance by answering the following question: “To what extent can variability in the measure be predicted from

organization membership?" The interclass correlation coefficient 2 (ICC2) examines the between-group variance by answering the following question: "How reliable are the organization means within a sample?" (Bliese & Halverson, 1996). Bliese (2000) indicated that ICC1 generally ranges from 0 to .50 with a median of .12. In the current study, most values slightly deviated from the proposed median score (see table 6).

Thus, we aggregated individual responses for each instrument (instructional leadership, organizational commitment) at the school level (Hoy & Miskel, 2008; Hoy et al., 1991). In other words, using between-school analysis (taking the school as the unit of analysis), the aggregation followed these steps: computing the mean of each item for each subscale for all teachers per school; computing the mean of the items for each subscale; aggregating the means to the school level; and aggregating the means at the school level. Pearson correlation coefficients were computed to determine the relations between PLMs (whole questionnaire and factors) and the validating variables (Table 5).

As predicted, the whole PLM questionnaire (PLM-all) had a significant, positive and moderate correlation with all of the instructional leadership factors: promoting a positive school-learning climate, defining the school's mission, managing the instructional program, $r = .40$, $r = .36$, $r = .33$ respectively ($p < .05$). Also the PLM's factors correlated with instructional leadership factors: "storing and retrieving information" revealed a significant, moderately positive correlation with "promoting a positive school-learning climate", "defining the school's mission", and "managing the instructional program", $r = .41$, $r = .36$, $r = .35$ respectively ($p < .05$). The "receiving information" factor (from students, parents, community, and superiors) was significantly and positively (relatively moderately) related to all of the instructional leadership factors: promoting a positive school-learning climate, defining the school's mission, managing the instructional program, $r = .35$, $r = .41$, $r = .34$ respectively ($p < .05$). Also "disseminating information" for teachers revealed a significant,

moderately positive correlation with promoting a positive school-learning climate $r = .42$ ($p < .01$), defining the school's mission, $r = .34$ ($p < .05$), and with managing the instructional program, $r = .44$ ($p < .05$) (Table 5).

With regard to organizational commitment, the whole PLM questionnaire exhibited a significant moderate correlation with affective commitment, $r = .39$, $p < .05$, whereas no significant correlation emerged with normative commitment, $r = .09$, $p > .05$, nor with continuance commitment $r = .15$, $p > .05$. Receiving information (from students, parents, community, and superiors) revealed a significant, moderately positive correlation with both affective and continuance commitment, $r = .44$, $r = .43$, $p < .01$. Analyzing external and internal information was significantly and positively (relatively moderately) related to affective commitment, $r = .37$, $p < .01$ (Table 5).

Discussion and Implications

Linking theoretical and empirical knowledge yielded a 22-item questionnaire with four factors, as follows: (1) *Storing and retrieving information*: principal's processes and means for storing personal and organizational experiences and then coding them into school memory; drawing on the encoded information to guide decisions and actions. Example item "I document meetings with the superintendent, municipal authority, or the parents." (2) *Receiving information (from students, parents, community, and superiors)*: principal's processes and means for acquiring information from stakeholders. Example item "I hold meetings with my superiors in order to learn from external events that affect the school." (3) *Disseminating information for teachers*: principals' processes for providing school personnel with information to be collectively analyzed. Example item "I disseminate teachers' successes among the staff." (4) *Analyzing external and internal information*: the processes in which the teaching faculty and the school principal meet in order to discuss and to analyze important events and/or usable accumulated data which affect the school such as: evaluating school

climate, evaluating students' academic achievements. Example item: "I examine external data (such as national exams) with the teacher staff."

The present findings supported external validation for the PLM questionnaire regarding tested predictors of school productivity. Interestingly, the results of the study have revealed a positive and significant association between PLMs (all scale) and all of the three factors of instructional leadership: defining the school's mission; managing the instructional program; and promoting a positive school-learning climate. Most of the PLM's factors (except "analyzing external and internal information") revealed a positive and significant correlation with principals' instructional leadership factors. We can argue that learning leaders provide a supportive environment in which the educational staff can expand its capacity to learn, lead, and work together in order to focus on student achievement (Seaton, Emmett, Welsh, & Peterossian 2008). Printy (2008) suggests that learning leaders act as agenda setters for teacher learning and school improvement and as knowledge brokers who support teacher learning and provide resources for teachers to actively engage in innovation.

The present findings supported external validation for the PLM questionnaire as a tested predictor of teachers' organizational commitment. The whole PLM questionnaire exhibited a significant moderate correlation with affective commitment whereas no significant correlation emerged with normative commitment, nor with continuance commitment. These findings substantiated other studies indicating that affective commitment is more dominant than normative and continuance commitment in explaining staff behavior (Cohen, 2003; Shapira & Rosenblatt, 2009). In practice, principals who use PLM processes more extensively may foster stronger feelings of appreciation among teachers, which may enhance more emotional attachment than sense of obligation. This may encourage teachers to invest more time and involvement in formal and informal activities to achieve the school's goals.

The development of the current PLM questionnaire offers school principals an instrument for assessing their own learning cycle. Principals may become more knowledgeable about which learning dimensions (e.g., analyzing and interpreting information; disseminating, storing, and retrieving information) require improvement in their learning mechanisms. For example, using information gathering without sufficient information analysis can create information overload, consequently increasing principals' sense of uncertainty and lowering their sense of functioning as learning leaders. In this regard, principal information overload – collecting information without sufficient mechanisms for analyzing and storing it in organizational memory – increases the risk of being unable to comprehend the information or use it effectively in decision-making processes (Zahra & George, 2002). Thus, PLM assessment could provide principals with the means to monitor their implementation of widely adopted processes, such as data-driven decision making or other organizational strategies, and then adjust such processes/mechanisms to achieve a more productive balance of components. For instance, collecting information could be balanced with arrangements for analyzing information, such that the information could provide guidance for productive action in schools.

The PLM questionnaire developed in the current study reflects the existence of and capacity for elementary-school-principal learning through institutionalized structures and procedures that evolve around information processing. However, the PLM questionnaire requires further analyses in diverse populations and samples to replicate and further refine its factor structure such as among secondary school principals. Important differences may be associated with school context, such as how strongly principals might perceive certain PLM processes at different education levels. Thus, it would be an important step in extending the validity of the factorial model to administer it in different school settings, cultures, and countries.

Inasmuch as our research focused on PLMs in elementary schools, school size should be explored as an important ecological feature of the social structure, influencing the nature of social interactions. Lee and Loeb (2000) found that small schools have an advantage over medium-sized or larger schools, because their teachers hold more positive attitudes toward their responsibility for students' learning. Hence, exploring the interrelationships between principal learning, school size, social learning interactions, and faculty attitudes (e.g., collective efficacy) is a valuable path to pursue.

Along with the theoretical and practical implications, the study is not limitation-free. The small number of teachers who supplied data (about 13 per school) puts in doubt the ability of the research variable aggregation to reliably represent elementary-school characteristics. Thus, aggregating the data to the school level should be perceived as a proxy of much more complicated sets of relationships within schools. Although we tested variation in participants' perceptions as a means of deciding whether it was reasonable to aggregate the data to the school level (*r*WG statistic), a well-grounded model is needed to solve the dilemma of whether and how individual perceptions of school learning can be integrated into the organizational level of learning.

The present study used self-reported questionnaires of principals and teachers. The self-reported study instruments could have been influenced by social desirability responding or by one source bias, endangering the "trueness" of the study findings. Further research should complement these perceptions with more objective measures, such as direct observations, to evaluate principals' actual implementation of learning mechanisms.

Finally, the risks and problems inherent in the PLM framework must also be addressed. Principals may use PLMs to advance their administrative agenda instead of focusing on instructional practices (Giles & Hargreaves, 2006). Thus, concerns have been raised that principals' control of data circulation in schools may be used against colleagues,

prompting mistrust of data use, especially in the context of high-stakes accountability (Heritage & Yeagley, 2005). As principals increasingly figure as local policy-makers (Knapp & Feldman, 2012), it is likely that without appropriate dialogue between schools and districts, states, and federal governments, PLMs could be strictly used by principals as a monitoring device rather than as a setting for learning.

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Table 1

Structure Matrix for Exploratory Factor Analysis (N =230)

| Analyzing external and internal information | Factor loadings on dimensions | | | Items |
|---|--|--|------------------------------------|--|
| | Disseminating information for teachers | Receiving information from students, parents, community, and superiors | Storing and retrieving information | In my school... |
| | | | 0.624 | I maintain meeting protocols. |
| | | | 0.586 | For evaluation purposes, I encourage the use of previous reports dealing with learning and teaching. |
| | | | 0.573 | I document meetings with the supervisor, ownership, municipal authority, or the parents. |
| | | | 0.498 | I make use of databases of teacher data (evaluation reports, absences, achievements) in decision making. |
| | | | 0.492 | I direct the staff to catalogue learning materials for the students. |
| | 0.683 | | | I meet with representatives of the PTA in order to receive feedback about school affairs. |
| | 0.598 | | | I participate in professional development programs for principals. |
| | 0.567 | | | I examine external evaluation data together with the local authority. |
| | 0.521 | | | I hold meetings with my superiors in order to learn from external |

Principals' Learning Mechanisms

| | | |
|-------|-------|---|
| | | events that affect the school. |
| | 0.519 | I meet with students in order to get exposed to difficulties, special requests, comments and insights. |
| | 0.505 | I meet with community representatives to promote school needs. |
| | 0.495 | I meet with parents in order to get exposed to difficulties, special requests, comments and insights. |
| | 0.493 | I examine external evaluation data with the superintendent. |
| 0.712 | | I disseminate among the staff reports concerning professional changes and innovations. |
| 0.608 | | I help teachers share their special ideas with other teachers in the school. |
| 0.604 | | I disseminate teachers' successes among the staff. |
| 0.566 | | I disseminate the district publications and Ministry circulars among the staff. |
| 0.731 | | I hold meetings with the teaching staff in order to examine information about external events that affect the school. |
| 0.659 | | I initiate and participate in teacher staff meetings for the evaluation of student academic achievements. |
| 0.620 | | I examine external data (such as |

Principals' Learning Mechanisms

| | | | | | |
|--|--------|-----|--------|--------|--|
| | | | | | national exams) with the teacher staff. |
| | | | | | I initiate and participate in teacher staff meetings for the evaluation of the school climate. |
| | 0.514 | | | | |
| | .510 | | | | I observe the teachers' lessons. |
| | 55.88% | 42% | 29.55% | 18.38% | Cumulative variance |

Note. Extraction method: Principal axis factoring. For clarity, only values equal or above .49 are provided. Sample size refers to principals.

Table 2: Comparison of Fit Indices of Competing PLM Models (N = 215)

| RMSEA | IFI | TLI | NFI | CFI | PGFI | AGFI | GFI | $\chi^2/(df)$ | Model |
|-------|------|------|-----|------|------|------|-----|---------------------|--------------------------|
| .11 | .60 | .55 | .46 | .59 | .57 | .623 | .68 | 534.72/(233) = 2.29 | One-factor |
| .10 | .66 | .61 | .51 | .65 | .59 | .67 | .73 | 488.30/(228) = 2.14 | Three-factor |
| .06 | .899 | .862 | .9 | .891 | .6 | .76 | .83 | 279.08/(199) = 1.40 | Four-factor ^a |
| .09 | .76 | .71 | .59 | .75 | .61 | .70 | .76 | 404.93/(220) = 1.84 | Five-factor |

Note. Improvement was reflected by a lower value for χ^2 and RMSEA and by a higher value for GFI, AGFI, PGFI, CFI, NFI, and TLI. Sample size refers to principals.

^a The four-factor model derived from exploratory factor analysis.

Table 3

Four Factors Operationally Defined (N =215)

| Loading on factor | Items per factor | Item # In my school ... |
|---|---|--------------------------------------|
| Storing and retrieving information | | |
| 0.703 | I document meetings with the supervisor, supervisor to superintendent, municipal authority, or the parents. | 2 |
| 0.695 | I maintain meeting protocols. | 9 |
| 0.623 | I direct the staff to catalogue learning materials for the students. | 1 |
| 0.535 | For evaluation purposes, I encourage the use of previous reports dealing with learning and teaching. | 3 |
| 0.477 | I make use of databases of teacher data (evaluation reports, absences, achievements) in decision making | 4 |
| Receiving information from students, parents, community, and superiors | | |
| 0.773 | I meet with community representatives to promote school needs. | 17 |
| 0.698 | I hold meetings with my superiors in order to learn from external events that affect the school. | 19 |
| 0.657 | I examine external evaluation data together with the local authority. | 15 |
| 0.648 | I meet with representatives of the PTA in order to receive feedback about school affairs. | 14 |
| 0.626 | I meet with students in order to get exposed to difficulties, special requests, comments and insights. | 18 |

| | | |
|--|---|----|
| 0.528 | I participate in professional development programs for principals. | 12 |
| 0.521 | I meet with parents in order to get exposed to difficulties, special requests, comments and insights. | 16 |
| 0.485 | I examine external evaluation data with the superintendent. | 13 |
| Disseminating information for teachers | | |
| 0.724 | I disseminate among the staff reports concerning professional changes and innovations. | 7 |
| 0.692 | I help teachers share their special ideas with other teachers in the school. | 6 |
| 0.677 | I disseminate teachers' successes among the staff. | 5 |
| 0.615 | I disseminate the district publications and Ministry circulars among the staff. | 8 |
| Analyzing external and internal information | | |
| 0.751 | I hold meetings with the teaching staff in order to examine information about external events that affect the school. | 11 |
| 0.684 | I examine external data (such as national exams) with the teacher staff | 20 |
| 0.669 | I initiate and participate in teacher staff meetings for the evaluation of the school climate | 21 |
| 0.521 | I initiate and participate in teacher staff meetings for the evaluation of student academic achievements | 22 |
| 0.492 | I observe the teachers' lessons. | 10 |

Note. Loadings for the four-factor model are all significant ($p < .05$). All factor loadings not shown in the table were set to zero. Sample size refers to principals

Table 4

Range of Factor Loadings, Descriptive Statistics, Alpha Coefficients, Inter-Item Correlations, and Correlation Analysis for the Four-Factor PLM Model (N = 215)

| 4. | 3. | 2. | Range of inter-item correlations | alpha | SD | M | Range of factor loadings | # of items | Composite factors |
|-------|-------|-------|-------------------------------------|-------|-----|------|-----------------------------|---------------|---|
| .46** | .51** | .44** | .218-.607 | .80 | .62 | 3.79 | .477-.703 | 5 | Storing and retrieving information |
| .56** | .42** | | .304-.618 | .85 | .57 | 4.39 | .485-.773 | 8 | Receiving information from students, parents, community, and superiors |
| .51** | | | .20-.468 | .82 | .45 | 4.47 | .583-.724 | 4 | Disseminating information for teachers |
| | | | .199-.589 | .80 | .54 | 4.19 | .460-.751 | 5 | Analyzing external and internal information |

Sample size refers to principals.

** $p < .01$.

Table 5

Correlations between PLM Questionnaire and Validity Variables (N = 215)

| 11 | 10 | 9 | 8 | 7. | 6. | 5 | 4. | 3. | 2. | 1. | alpha | SD | M | rWG | Variable: Factor (No. of items) |
|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|----|-------|------|------|-----|--|
| .04 | .06 | .10 | .41* | .35* | .36* | .83** | .46** | .51** | .44** | - | .80 | .62 | 3.79 | - | 1. PLM: Storing and retrieving information (5) |
| .43** | .15 | .44** | .35* | .34* | .41* | .76** | .56** | .42** | - | | .75 | .57 | 4.39 | - | 2. PLM: Receiving information (8) |
| -.06 | -.04 | .07 | .42** | .44* | .34* | .71** | .51** | - | | | .58 | .45 | 4.47 | - | 3. PLM: dissemination of information (4) |
| .16 | .13 | .37** | .12 | .1 | .14 | .79** | - | | | | .72 | .54 | 4.19 | - | 4. PLM: Analyzing external and internal information. (5) |
| .15 | .09 | .39* | .40* | .33* | .36* | - | | | | | .88 | .44 | 4.19 | - | 5. PLM: Total (22) |
| .13 | .06 | .15 | .9** | .88** | - | | | | | | 0.94 | 0.43 | 3.91 | .93 | 6. IL- school's mission |
| .17 | .02 | .20* | .95** | - | | | | | | | 0.90 | 0.39 | 4.09 | .94 | 7. IL- instructional program |
| .14 | .04 | .19 | - | | | | | | | | 0.90 | 0.43 | 3.43 | .92 | 8. IL- climate |
| .63** | .68** | - | | | | | | | | | 0.78 | 0.5 | 4.19 | .9 | 9. Commitment - affective |
| .55** | - | | | | | | | | | | 0.67 | 0.43 | 4.25 | .75 | 10. Commitment - normative |
| - | | | | | | | | | | | 0.74 | 0.45 | 4.05 | .73 | 11. Commitment - continuance |

Note. The rWG statistic represents reliability within schools averaged across all schools (James et al., 1993). Sample size refers to schools.

* $p < .05$, ** $p < .01$.

Table 6

ICC1, ICC2 Values

| F | ICC2 | ICC1 | |
|---------|------|------|----------------------------|
| 4.53*** | .78 | .19 | IL - climate |
| 4.12*** | .76 | .17 | IL - school's mission |
| 4.66*** | .79 | .2 | IL - instructional program |
| 2.67*** | .63 | .1 | Commitment - affective |
| 2.88*** | .65 | .11 | Commitment - normative |
| 2.02*** | .51 | .06 | Commitment - continuance |

***p<.001

Appendix (A) the final PLM questionnaire (22 items)

| Almost always | Often | Sometime s | Once in a while | Never | | |
|--------------------------|--------------|-----------------------|----------------------------|--------------|--|----|
| 5 | 4 | 3 | 2 | 1 | I direct the staff to catalogue learning materials for the students. | 1. |
| 5 | 4 | 3 | 2 | 1 | I document meetings with the supervisor, ownership, municipal authority, or the parents. | 2. |
| 5 | 4 | 3 | 2 | 1 | For evaluation purposes, I encourage the use of previous reports dealing with learning and teaching. | 3. |
| 5 | 4 | 3 | 2 | 1 | I make use of databases of teacher data (evaluation reports, absences, achievements) in decision making. | 4. |
| 5 | 4 | 3 | 2 | 1 | I disseminate teachers' successes among the staff. | 5. |
| 5 | 4 | 3 | 2 | 1 | I help teachers share their special ideas with other teachers in the school. | 6. |
| 5 | 4 | 3 | 2 | 1 | I disseminate among the staff reports concerning professional changes and innovations. | 7. |
| 5 | 4 | 3 | 2 | 1 | I disseminate the district publications and Ministry circulars among the staff. | 8. |
| 5 | 4 | 3 | 2 | 1 | I maintain meeting protocols. | 9. |

Principals' Learning Mechanisms

| Almost always | Often | Sometimes | Once in a while | Never | | |
|----------------------|--------------|------------------|------------------------|--------------|---|-----|
| 5 | 4 | 3 | 2 | 1 | I observe the teachers' lessons. | 10. |
| 5 | 4 | 3 | 2 | 1 | I hold meetings with the teaching staff in order to examine information about external events that affect the school. | 11. |
| 5 | 4 | 3 | 2 | 1 | I participate in professional development programs for principals. | 12. |
| 5 | 4 | 3 | 2 | 1 | I examine external evaluation data with the superintendent. | 13. |
| 5 | 4 | 3 | 2 | 1 | I meet with representatives of the PTA in order to receive feedback about school affairs. | 14. |
| 5 | 4 | 3 | 2 | 1 | I examine external evaluation data together with the local authority. | 15. |
| 5 | 4 | 3 | 2 | 1 | I meet with parents in order to get exposed to difficulties, special requests, comments and insights. | 16. |
| 5 | 4 | 3 | 2 | 1 | I meet with community representatives to promote school needs. | 17. |
| 5 | 4 | 3 | 2 | 1 | I meet with students in order to get exposed to difficulties, special requests, comments and insights. | 18. |
| 5 | 4 | 3 | 2 | 1 | I hold meetings with my superiors in order to learn from external events that affect the school. | 19. |
| 5 | 4 | 3 | 2 | 1 | I examine external data (such as national exams) with the teacher staff. | 20. |

Principals' Learning Mechanisms

| Almost always | Often | Sometimes | Once in a while | Never | | |
|----------------------|--------------|------------------|------------------------|--------------|---|-----|
| 5 | 4 | 3 | 2 | 1 | I initiate and participate in teacher staff meetings for the evaluation of the school climate. | 21. |
| 5 | 4 | 3 | 2 | 1 | I initiate and participate in teacher staff meetings for the evaluation of student academic achievements. | 22. |

Appendix (B) PLM final Hebrew version (22 items).

| כמעט תמיד | לעיתים קרובות | לפעמים | פעם בכמה זמן | כלל לא | | |
|--------------|------------------|--------|-----------------|--------|---|-----|
| 5 | 4 | 3 | 2 | 1 | אני מנחה את הצוות לקטלג חומרי למידה עבור התלמידים | .1 |
| 5 | 4 | 3 | 2 | 1 | אני מתעד פגישות עם הפיקוח, בעלות, רשות, או הורים | .2 |
| 5 | 4 | 3 | 2 | 1 | אני מעודד שימוש בדו"חות קודמים העוסקים בלמידה ובהוראה לצורכי הערכה | .3 |
| 5 | 4 | 3 | 2 | 1 | אני נעזר במאגרי מידע של נתוני מורים (דו"חות הערכה, היעדרויות, הישגים) לשם קבלת החלטות | .4 |
| 5 | 4 | 3 | 2 | 1 | אני מפיץ הצלחות של מורים בקרב הצוות | .5 |
| 5 | 4 | 3 | 2 | 1 | אני מסייע למורים לשתף מורים אחרים בבית הספר ברעיונות מיוחדים שיש להם | .6 |
| 5 | 4 | 3 | 2 | 1 | אני מפיץ לצוות דו"חות העוסקים בשינויים ובחידושים מקצועיים | .7 |
| 5 | 4 | 3 | 2 | 1 | אני מפיץ בקרב הצוות את פרסומי המחוז, חוזרי המנכ"ל | .8 |
| 5 | 4 | 3 | 2 | 1 | אני מנהל פרוטוקולים של ישיבות | .9 |
| 5 | 4 | 3 | 2 | 1 | אני צופה בשיעורי המורים | .10 |
| 5 | 4 | 3 | 2 | 1 | אני מקיים ישיבות עם צוות המורים כדי לבחון מידע על אירועים חיצוניים המשפיעים על ביה"ס | .11 |

| כמעט תמיד | לעיתים קרובות | לפעמים | פעם בכמה זמן | כלל לא | | |
|-----------|---------------|--------|--------------|--------|---|-----|
| 5 | 4 | 3 | 2 | 1 | אני משתתף בהשתלמויות מנהלים לפיתוח מקצועי | .12 |
| 5 | 4 | 3 | 2 | 1 | אני בוחן יחד עם הפיקוח נתוני הערכה חיצוניים | .13 |
| 5 | 4 | 3 | 2 | 1 | אני נפגש עם נציגי ועד ההורים כדי לקבל משוב על הנעשה בבית הספר | .14 |
| 5 | 4 | 3 | 2 | 1 | אני בוחן יחד עם הרשות המקומית נתוני הערכה חיצוניים | .15 |
| 5 | 4 | 3 | 2 | 1 | אני נפגש עם הורים כדי להיחשף לקשיים, לבקשות מיוחדות, להערות ולהארות | .16 |
| 5 | 4 | 3 | 2 | 1 | אני נפגש עם נציגי הקהילה כדי לקדם את צרכי בית הספר | .17 |
| 5 | 4 | 3 | 2 | 1 | אני נפגש עם תלמידים כדי להיחשף לקשיים, לבקשות מיוחדות, להערות ולהארות | .18 |
| 5 | 4 | 3 | 2 | 1 | אני מקיים ישיבות עם הגורמים הממונים עלי כדי ללמוד מאירועים חיצוניים המשפיעים על ביה"ס | .19 |
| 5 | 4 | 3 | 2 | 1 | אני בוחן יחד עם צוות המורים נתוני הערכה חיצוניים (כגון מיצ"ב) | .20 |
| 5 | 4 | 3 | 2 | 1 | אני יוזם ומשתתף בישיבות צוות מורים להערכת האקלים הבית-ספרי | .21 |
| 5 | 4 | 3 | 2 | 1 | אני יוזם ומשתתף בישיבות צוות מורים להערכת הישגיהם הלימודיים של התלמידים | .22 |