

The organisational context of middle management role behaviour in Hungarian schools

Márta Héreginé Nagy^{a,b} Sándor Lénárd^b László Horváth^b and
Nóra Rapos^b

^aDoctoral School of Education, ELTE Eötvös Loránd University, Budapest, Hungary; ^bInstitute of Education, ELTE Eötvös Loránd University, Budapest, Hungary

ABSTRACT

Growing evidence suggests that the effectiveness of a school's operations is determined not by a single leader, but by a community of leaders. Middle managers can coordinate processes in formal positions and lead informal groups, facilitating the realisation of leadership goals. This study utilises a large-scale survey to analyse middle managers' perceptions of organisational learning and discuss their additional supporting roles and responsibilities considering organisational-level contingency variables in a centralised education system (Hungary). How can middle management function in a centralised educational system? How can it act as a 'bridge' and support organisational and individual learning? Our findings reveal that middle managers perceive leadership similarly to school staff (i.e. in terms of learning organisational behaviour), while principals' perceptions significantly differ. The study examined teachers' perceptions of organisational learning in various positions according to school size and type. It was found that middle managers play a more prominent role in smaller schools compared to larger ones, as they are more likely to utilise their strategic role in contexts with a more cohesive community. These findings suggest that the function of middle management should be better exploited in larger organisations.

KEYWORDS

Middle managers;
organisational learning;
professional development;
special roles; models of
teachers learning (MOTEL)

Introduction

Middle managers are organisational actors who may be appointed as members of leadership teams (e.g. at schools with distributive leadership), leaders of informal groups or small-scale projects, or 'invisible' informal leaders of an institutional process. In the context of schools, not only their visibility but also the roles that they perform are diverse (De Nobile 2018). In fact, middle managers are key actors in boundary crossing within institutions; they have varied

responsibilities, competencies, and roles. In recent years, research has highlighted that the role of middle management goes beyond formal administrative tasks and leading subject teachers and may include curriculum development, mentoring and personal support, subject and pedagogical leadership, and simultaneous involvement in the parallel leadership of different groups (Bryant and Rao 2019; De Nobile 2018; Gurr and Drysdale 2013; Lipscombe, Tindall-Ford, and Lamanna 2023). One of the most important lines of empirical research on middle managers is the study of middle managers' roles and role perceptions (e.g. Au, Wright, and Botton 2003; Bryant and Rao 2019; Grootenboer, Edwards-Groves, and Rönnerman 2015; Gurr and Drysdale 2013; Tay et al. 2020), furthermore, research related to leadership development is emerging as a priority theme (Bassett and Robson 2017; Cardno and Robson 2016). Less research has focused on the characteristics of leadership skills, where, for example, Hairon et al. (2015) found that the effectiveness of middle managers' support for teachers is influenced by middle managers' facilitation skills, subject knowledge, teaching experience and ability to build trust. Another less investigated issue is that middle managers are key to supporting students' development, partly due to their strong presence in the classroom and because the basis of their position is their recognised professional knowledge (Bennett et al. 2007; Grootenboer, Edwards-Groves, and Rönnerman 2015). However, empirical studies of middle managers agree that formal or supervisory roles for middle managers can generate tensions in horizontal situations, such as supporting fellow teachers. Therefore, it is important that newer research should give more attention to understanding the contextual – organisational and social – effects.

The current study explores the nature of the roles that middle managers fulfil in schools and addresses whether these are compatible and how they are influenced by different contextual factors, such as school type and size and the quality of organisational learning processes. As this study focuses on the organisational context, related literature from organisational studies is reviewed first. The study is embedded in organizational studies discourse which introduces the discussion on the role of middle management in general and specifically in centralised education system (Hungary). Based on the literature review the problem statement and research questions are formulated at the end of the chapter.

Related background from organisational studies

Organisational studies define organisations along three assumptions: (1) structured cooperation within a group of individuals who define a set of tasks and internal relations; (2) common, clearly defined goals; and (3) dynamic interaction between the organisation and its environment. Schools can also be described as organisations – more precisely, functional organisations with a network of roles

and positions established to achieve organisational goals. Within the organisation, some tasks are formally prescribed and require specific qualifications and specialised skills. From a functional perspective, schools are structured and divided into smaller units (Adey 2006; Voogt et al. 2015).

Research on schools as organisations has taken several directions, but it is worth highlighting two of them. First, the learning organisation approach, which identifies schools as learning organisations as the optimal form of individual, community and organisational development (Wahlstrom and Louis 2008; Watkins and Cervero 2000), not only supports professional development but shifts the way of thinking about learning, which allows teachers to show pedagogical development that changes their practice. Emphasis is placed on approaches that do not necessarily imply that learning takes place equally and with the same intensity across the entire organisation (i.e. the entire organisation is not necessarily a natural learning environment for teachers; Adey 2006; Voogt et al. 2015).

Second, the widely applied neo-institutionalist approach separates the concepts of organisation and institution (Biggart 2015). It theorises that the legitimacy of an organisation is not primarily based on its legal-formal structures, but its significance is perceived by formal and informal groups. To the extent that these groups can communicate this outside of the organisation, their wider environment will perceive them as legitimate, thereby empowering them. Several studies have emphasised personal, affective, and individual factors in professional learning (Kelchtermans 2009; Korthagen 2016) and the need to strengthen formal or informal professional groups and learning communities within organisations.

Leadership has a distinct role to play in organisational learning and the creation of shared knowledge (Kahrens and Früauff 2018), both by encouraging members of the institution to internalise and achieve common goals and providing opportunities for the creation of organisational knowledge. Leadership can achieve these by developing an organisational knowledge vision (i.e. by articulating what management considers to be knowledge in the organisation and consciously shaping what knowledge the organisation needs in the future and how it can be created), among other measures (Kahren and Früauff 2018). If this process is successful, continuous, and meaningful interactions will take place between members. Leaders of formal or informal learning professional communities (i.e. middle managers) play a significant role in translating an organisational vision into specific concepts and creating the conditions needed for knowledge creation (Nonaka, Krogh, and Voelpel 2006). Their role within an organisation depends on its size and culture and the cultural specificities of the given country (social context), for example the ability of the top level to delegate or the middle level to take responsibility.

Finally, organisational approaches increasingly suggest that schools cannot be considered as static entities, but should be viewed as complex, dynamic

systems (Aouad and Bento 2020; Bento, Adenusi, and Khanal 2023). Such a system is characterised by being composed of multiple components (further subsystems), changing over time, contextualised, and characterised by multiple interdependent but not symmetric relationships (De Bot 2008; Larsen-Freeman and Cameron 2008). The systems theory approach has also opened up a new perspective in the study of middle managers (Mowles 2021; Stacey 2009) and has necessitated analyses embedded in social and organizational contexts (Stacey 2009; Sttandacker, et al.,) Such an analysis embedded in a sectoral policy context points to the Scottish and Irish examples, in which the different developmental paths of middle management in two different educational policy concepts become visible (Forde et al. 2021) . However, as Bento points out, there is little analysis in Europe, especially in Central and Eastern Europe (Bento, Adenusi, and Khanal 2023). Our study therefore focuses on an interpretation embedded in the Hungarian context. The local, regional approach thus serves not as a limitation, but as a deeper understanding of the role behaviour of middle managers, in the sense that Kemmis' theory of practice architecture examines the contextual factors that influence the practice that is implemented (Kemmis et al. 2014). The focused topic, role behaviour, is suitable to capture the dynamics and identify the contextual factors that play a role in it.

The role of middle management

The role of middle managers in school processes has been increasingly emphasised in the literature on educational management and organisational development. In part, this is related to a drive for accountability in the education system; researchers have shifted from understanding individual teachers to understanding leaders' collective efforts to ensure that school processes operate as effectively as possible. Within this discourse, there is a growing understanding of the role of middle managers. Some studies have highlighted their importance in school effectiveness (Adey 2000; Grootenboer, Edwards-Groves, and Rönnerman 2015; Harris et al. 2019; Leask and Terrell 2014) and bridging the gap between leader or management and staff (Bennett et al. 2007; Fitzgerald and Gunter 2006; Gurr and Drysdale 2013) and their role in institutional development and innovation processes.

However, research has been hampered by the challenge of defining middle managers. One of the reasons for this difficulty is that the concept of middle management comes from the field of business and had to be adapted to the educational context. The term 'middle manager' was commonly used in corporate and earlier educational literature. In the context of schools, emphasis has shifted from middle management (as a group) to the concept of leadership from the middle (as a strategy). This perspective marks a change in terminology from middle managers to middle leaders. Although the term 'middle leader' is

increasingly used in education, Gurr and Drysdale (2013) argued that its definition depends on the context and structure of the school or school system. Thus, who can be considered a middle leader in a given institution is context dependent. Accordingly, the diversity and operation of school organisational structures in different contexts create difficulties in defining middle managers, as they are perceived to have various levels and functions (Gronn 2002; Lipscombe, Tindall-Ford, and Lamanna 2023).

Consequently, there has also been controversy over defining the responsibilities, decision-making powers, and typical tasks of middle managers (Glover et al. 1998). Gurr and Drysdale (2013) defined middle managers as managers with significant responsibility over specific areas in a school, while Harris et al. (2019) had a similar interpretation of this concept. In a school context, middle leaders are understood as those with formal leadership and management responsibilities and tasks and who are positioned between senior management and teachers (Gurr and Drysdale 2013). At the same time, there is a strong tendency in the literature to interpret the term ‘middle manager’ in relation to roles. In a comprehensive analysis, De Nobile (2018) summarised the roles played by middle management, the competencies required to fulfil them, the possible outcomes, and the inputs that support them (see Figure 1).

The model places the possible roles that middle managers can play on a continuum between management and leadership. It combines roles related to the running of the organisation (administrative role, work organisation, and strategy support), support for colleagues (human resource development), and student development (student support).

Middle managers’ involvement in the management and administration of organisations has increased regarding organisational development, innovation,

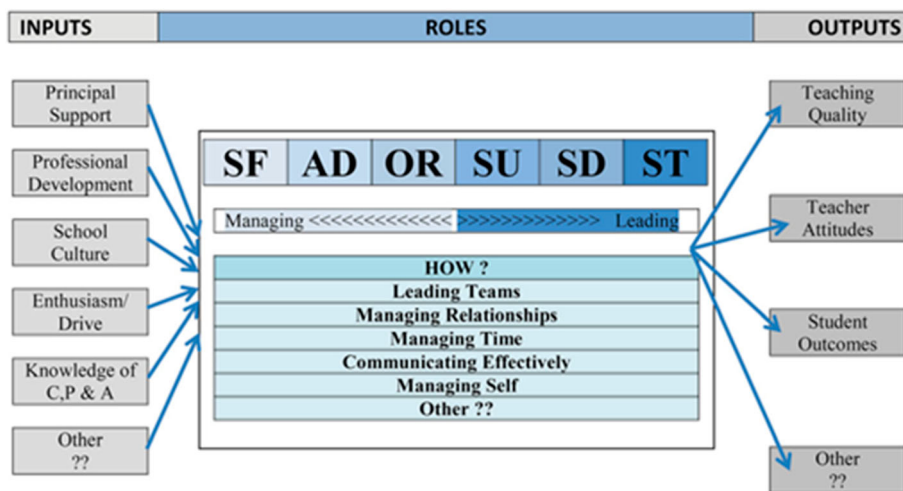


Figure 1. A model summarising the roles, competencies, supporting factors and possible outcomes of middle leadership in schools (De Nobile 2018).

and accountability. However, these often supervisory and managerial tasks can be a source of role conflict, as middle managers tend to view themselves as teachers, team members, and staff members rather than leaders (Bennett et al. 2007).

Regarding support for colleagues and students, it is widely known that school leadership strongly influence what and how teachers learn in schools (Knapp et al. 2010; Leithwood and McAdie 2007; Leithwood, Patten, and Jantzi 2010 ; Qian, Walker, and Xiaowei 2017 ; Stoll et al. 2006) by creating formal learning situations, building trust within the organisation, and shaping opportunities for peer learning. Harris and Jones (2010) also indicated that middle managers play a key role in building strong professional learning communities (i.e. supporting teaching and learning), especially when they are supported by senior management. Middle managers can serve as experts who help their fellow teachers link new theoretical knowledge to local practises and lead research-oriented professional learning for them (Soekijad et al. 2011; Stoll et al. 2015; Talbert 2010). Middle managers can also horizontally and vertically cross knowledge boundaries (e.g. between managerial and professional knowledge and partnerships with networks outside the school) and provide innovative learning environments for their colleagues (Battilana, Leca, and Boxenbaum 2009; Hargreaves and Fullan 2012).

However, the specificities and models of learning of middle managers are less understood. Lipscombe, Tindall-Ford, and Lamanna (2023) confirmed this finding in the most recent systematic review on the topic. The research argued that the understanding and practice of professional learning by middle managers are not elaborated; thus, adequate preparation of middle leaders is not yet possible.

Overall, the issue of defining and interpreting the role of middle managers is relevant to the current study. In our view, middle leadership is not only a formal status within an organisation but also a position from which employees can both horizontally and vertically exert their influence on its leadership, staff, and students (Adey 2000; Brown, Boyle, and Boyle 2002; Bush 2008; Busher 2005; Dinham 2007; Glover et al. 1999; Poultney 2007). In our understanding, middle leadership is a complex, even tension-laden, dynamically changing role, and behaviour, taking different forms in different contexts. The role interpretation described above relates our use of the term to middle leadership and not to the term of management as it is linked to formalisation. Thus, middle managers play the broad range of roles described by De Nobile (2018). In our study we were able to grasp middle managers only from a formal role, therefore the article will use middle managers/management as a term of reference.

The role of middle managers in the Hungarian educational context

Approaches to understanding educational systems (and, more narrowly, schools and their actors) based on complexity theory (Burns and Köster 2016) are

gaining ground, which highlight the system of macro-, meso-, and micro-level processes and the multi-level nature of relationships. In a systems approach, country-specific professional discourses that define the relationship between schools and the state and the general leadership, management, and administrative context in terms of the governance and oversight of schools have also become important. In Hungary, the most dominant discourse today is the issue of autonomy and control (Chrappán, Kopp, and Pesti 2020; Kopp and Kálmán 2023). Contextual issues, autonomy, and control make the interpretation of the concept, organisational role, and function of middle managers particularly interesting, as several models of professions link autonomy and role interpretation both at the individual (Evetts 2011; MacLennan, Goodson, and Hargreaves 1997) and organizational level (Sachs 2016).

Although the Hungarian education system has undergone significant changes and democratisation over the past 30 years, there is currently a loss of autonomy at both the individual and organisational levels, socio-economic and regional inequality is high, salaries are low, the proportion of women is high, and the teacher shortage is worsening (Kopp and Kálmán 2023). In Hungary, 'the legal regulatory system is essentially accountability-centred, the instrument of control is linked to the development of the profession, the content of legal regulation and the documents that support operational processes are more development-oriented, but their function is clearly linked to control and evaluation' (Szivák et al. 2019). This strong central control reduces the autonomy of managers.

Problem statement and research questions

Considering the identified research gap, this study contributes to the understanding of the role of middle management in schools from an organisational perspective. The following research questions and hypotheses were formulated:

- RQ1: How do middle managers' perceptions of organisational learning processes in schools differ from those of staff and principals?
 - H1.1: Middle managers have distinctive perceptions of organisational learning in schools compared to staff and principals.
 - H1.2: Middle managers' perceptions of organisational learning are dependent on organisational-level contingency variables (school type and size).
- RQ2: What additional roles and responsibilities do middle managers in Hungarian schools take on considering organisational-level contingency variables?
 - H2.1: Middle managers take on additional roles and responsibilities compared to staff.
 - H2.2: The additional roles and responsibilities taken on by middle managers depend on organisational-level contingency variables (school type and size).

The next section describes the methodology that was adopted to answer the research questions and gather evidence for the hypotheses.

Methodology

Background of the research

The present study was conducted in the framework of a comprehensive research project on continuous professional development models for teachers at the organisational and individual levels. During the quantitative phase of the study, a representative sample of Hungarian public education institutions was selected, and a survey (via Qualtrics) was sent to teachers and principals. In this paper, we focus on specific elements of the quantitative data collection (i.e. organisational background variables, role variables, and the learning organisation scale for organisational learning) and examine the research questions from the perspective of middle managers from a previously unexplored perspective. The research was conducted in compliance with basic research ethical principles (e.g. anonymity, voluntariness, and informed consent), and permission was obtained from the faculty's research ethics committee.

Participants and procedures

The study followed a quantitative research strategy, which involved the use of a large-scale database for analysis. Sampling was based on a stratified random sample of primary and secondary educational institutions, which were selected based on their profile (primary school, general secondary school, or vocational secondary school) and regional dispersion. The sample was weighted based on distributions regarding the maintainer of the school and their size. Therefore, it can be considered representative in relation to these variables. The sample included 5,063 teachers from 656 schools; at least 20% of participants ($N = 5$) at each school completed the survey. Given the focus of the analysis, the sample was further disaggregated into staff ($N = 3,186$; 78.5% female; average age = 49.1), middle managers ($N = 983$; 84% female; average age = 52), and (vice-)principals ($N = 894$; 72.7% female; average age = 53.72).

Instruments

During the study, participants were asked to complete an online survey that contained the following variables: organisational-level contingency factors (school type and size), additional roles and responsibilities that the participants fulfilled, and the characteristics of organisational learning. For the latter, the Hungarian version (Horváth 2022) of the Dimensions of the Learning Organisation Questionnaire (DLOQ) developed by Marsick and Watkins (2003) was used; it

focuses on continuous learning, inquiry and dialogue, collaboration and team learning, systems to capture learning, empowerment, connecting the organisation to the external environment, and providing strategic leadership for learning.

Results

The main objective of this study was to explore how middle managers perceive learning organisational behaviour considering organisational-level contingency variables. To explain patterns in perceptions, the views of middle-level leaders were contrasted with those of employees and principals. Considering learning organisational behaviour as an organisational-level construct, we examine, beside leadership position, the influencing factor of organisational-level contingency variables like the size and type of schools.

Testing the learning organisation scale: invariance and internal consistency

In previous studies, the Hungarian version of the DLOQ was tested on the entire sample. In our case, we wanted to compare distinct groups (various levels of leadership); thus, we first needed to check for measurement invariance (Chen 2007). Configural (factor structure), metric (loadings), and scalar (intercepts) invariance were tested using R (RStudio 2022.07.2 Build 576 and R version 4.1.2) with the semTools (Jørgensen et al. 2022) and lavaan (Rosseel 2012) packages. Since χ^2 is sensitive to large sample sizes, it was unsurprising that χ^2 difference tests were significant in both comparisons (configural vs. metric and metric vs. scalar). Using the cut-off values for changes in goodness-of-fit indices suggested by Chen (2007), we were able to establish scalar invariance. The results of the model comparisons are shown in Table 1.

Once model fit and scale invariance were established, we checked the internal consistency of the scales in our subsamples. Table 2 details the number of respondents and the mean, standard deviation, and McDonald's omega measures of the scales for staff, principals, and middle managers. Internal consistency was found to be adequate (< 0.7) across all subsamples for all scales, as McDonald's omega measures ranged from 0.754–0.927.

At the descriptive level, it is important to note principals' tendency to hold more positive views (higher ratings) of the dimensions than other stakeholders, except for the dimension 'Embedded systems,' which middle managers and staff rated more highly.

Understanding organisational learning from different perspectives

By establishing model fit, scale invariance, and internal consistency, we were able to proceed to the analysis of middle managers' perceptions of

Table 1. Model comparisons for the results of invariance testing of the learning organisation scale.

	χ^2 (df)	CFI	TLI	RMSEA	90% CI	SRMR	$\Delta \chi^2$ (df)	Δ CFI	Δ TLI	Δ RMSEA	Δ SRMR
C	2925.72 (504)	0.959	0.949	0.073	.071, .076	0.028					
M	2975.28 (532)	0.959	0.951	0.072	.069, .074	0.034	49.56 (28)**	0	0.002	−0.002	0.006
S	3293.68 (560)	0.954	0.948	0.074	.071, .076	0.037	318.4 (28)***	−0.005	−0.003	0.002	0.002

Notes: C – configural model; M – metric model; S – scalar model.

Table 2. Descriptive statistics and internal consistency of scales for the sub-samples.

DLOQ dimensions	Sub-sample	N	M	SD	ω
Continuous Learning	Staff	2968	4.62	1.117	0.828
	Principal	866	4.75	0.934	0.754
	Middle managers	953	4.6	1.071	0.801
Inquiry & Dialogue	Staff	2973	4.31	1.231	0.927
	Principal	863	4.37	1.026	0.891
	Middle managers	951	4.25	1.17	0.927
Team Learning	Staff	2860	4.29	1.308	0.915
	Principal	860	4.47	1.046	0.849
	Middle managers	936	4.19	1.283	0.901
Embedded Systems	Staff	2831	4.35	1.304	0.874
	Principal	857	3.88	1.135	0.777
	Middle managers	929	4.2	1.288	0.859
Empowerment	Staff	2892	4.47	1.273	0.926
	Principal	858	4.55	1.075	0.847
	Middle managers	934	4.4	1.284	0.925
System connection	Staff	2867	4.69	1.226	0.915
	Principal	860	4.81	1.035	0.865
	Middle managers	933	4.68	1.214	0.92
Providing Leadership	Staff	2924	4.8	1.2	0.919
	Principal	856	5.01	0.948	0.88
	Middle managers	944	4.72	1.253	0.926

organisational learning considering organisational-level contingency variables (school type and size). The first research question explores differences between middle managers, staff, and principals' perceptions of organisational learning (RQ1). To investigate this research question, the first hypothesis was that middle managers would interpret organisational learning in unique ways. (H1.1). To test this hypothesis, we conducted a multivariate analysis of variance (MANOVA) on the seven dimensions of the DLOQ; we included managerial position (staff, principal, or middle manager), school size (small, medium, or large), school type (primary school, general secondary school, Type 1 vocational secondary school, or Type 2 vocational secondary school), and all possible interactions between these variables in our model. Table 3 summarises the results of these comparisons.

The results suggest that there are significant differences regarding all seven dimensions of the DLOQ by school type and size. This underlines the influence of organisational-level contingency variables in perceptions of organisational learning. Although leadership position appeared to be a key factor, there were no significant differences on the dimensions of 'Inquiry and dialogue' and 'System connection' by leadership position. The interactions between the factors had less influence on participants' perceptions of organisational learning than the main terms. Significant differences were only identified for the interaction between school type and size (for 'Team Learning,' 'Empowerment,' 'System Connection,' and 'Providing leadership') and between leadership position and school size (for 'Providing leadership').

An examination of all pairwise comparisons in the different analyses is beyond the scope of this paper. Therefore, we only focus on one dimension,

Table 3. Results of MANOVA for DLOQ scales based on position, school type, school size and their interactions.

	CL	ID	TL	ES	EM	SC	PL
Overall model	F(35) = 4.33; $p < .001$	F(35) = 5.09; $p < .001$	F(35) = 7.02; $p < .001$	F(35) = 7.82; $p < .001$	F(35) = 4.03; $p < .001$	F(35) = 3.8; $p < .001$	F(35) = 6.36; $p < .001$
Leadership position	F(2) = 3.54; $p < .029$; $\eta_p^2 = 0.001$	F(2) = 1.98; $p = 0.138$; $\eta_p^2 = 0.001$	F(2) = 9.16; $p < .001$; $\eta_p^2 = 0.004$	F(2) = 28.76; $p < .001$; $\eta_p^2 = 0.012$	F(2) = 3.22; $p = 0.040$; $\eta_p^2 = 0.001$	F(2) = 1.68; $p = .187$; $\eta_p^2 = 0.001$	F(2) = 9.71; $p < .001$; $\eta_p^2 = 0.004$
School type	F(3) = 14.69; $p < .001$; $\eta_p^2 = 0.009$	F(3) = 11.81; $p < .001$; $\eta_p^2 = 0.007$	F(3) = 35.96; $p < .001$; $\eta_p^2 = 0.023$	F(3) = 19.37; $p < .001$; $\eta_p^2 = 0.013$	F(3) = 15.22; $p < .001$; $\eta_p^2 = 0.01$	F(3) = 16.21; $p < .001$; $\eta_p^2 = 0.01$	F(3) = 31.5; $p < .001$; $\eta_p^2 = 0.02$
School size	F(2) = 12.92; $p < .001$; $\eta_p^2 = 0.005$	F(2) = 22.66; $p < .001$; $\eta_p^2 = 0.009$	F(2) = 11.51; $p < .001$; $\eta_p^2 = 0.005$	F(2) = 9.73; $p < .001$; $\eta_p^2 = 0.004$	F(2) = 5.3; $p = .005$; $\eta_p^2 = 0.002$	F(2) = 9.15; $p < .001$; $\eta_p^2 = 0.004$	F(2) = 7.38; $p < .001$; $\eta_p^2 = 0.003$
Leadership position * school type	F(6) = 0.393; $p = 0.884$; $\eta_p^2 < 0.001$	F(6) = 0.46; $p = .836$; $\eta_p^2 = 0.001$	F(6) = 1.63; $p = .135$; $\eta_p^2 = 0.002$	F(6) = 0.85; $p = .535$; $\eta_p^2 = 0.001$	F(6) = 0.66; $p = .685$; $\eta_p^2 = 0.001$	F(6) = 0.65; $p = 0.690$; $\eta_p^2 = 0.001$	F(6) = 0.43; $p = .858$; $\eta_p^2 = 0.001$
Leadership position * school size	F(4) = 1.55; $p = .186$; $\eta_p^2 = 0.001$	F(4) = 2.06; $p = .084$; $\eta_p^2 = 0.002$	F(4) = 1.275; $p = .277$; $\eta_p^2 = 0.001$	F(4) = 0.97; $p = .422$; $\eta_p^2 = 0.001$	F(4) = 1.32; $p = 0.26$; $\eta_p^2 = 0.001$	F(4) = 2.18; $p = .069$; $\eta_p^2 = 0.002$	F(4) = 2.56; $p = .036$; $\eta_p^2 = 0.002$
School type * school size	F(6) = 1.21; $p = .298$; $\eta_p^2 = 0.002$	F(6) = 1.14; $p = .334$; $\eta_p^2 = 0.001$	F(6) = 2.29; $p = .033$; $\eta_p^2 = 0.003$	F(6) = 2.1; $p = .051$; $\eta_p^2 = 0.003$	F(6) = 3.04; $p = .006$; $\eta_p^2 = 0.004$	F(6) = 2.61; $p = .016$; $\eta_p^2 = 0.003$	F(6) = 3.95; $p < .001$; $\eta_p^2 = 0.005$
Leadership position * school type * school size	F(12) = 0.5; $p = 0.917$; $\eta_p^2 = 0.001$	F(12) = 0.72; $p = 0.734$; $\eta_p^2 = 0.002$	F(12) = 0.87; $p = .577$; $\eta_p^2 = 0.002$	F(12) = 0.4; $p = .964$; $\eta_p^2 = 0.001$	F(12) = 0.34; $p = 0.982$; $\eta_p^2 = 0.001$	F(12) = 0.79; $p = .663$; $\eta_p^2 = 0.002$	F(12) = 0.46; $p = .461$; $\eta_p^2 = 0.001$

Notes: CL – Continuous Learning; ID – Inquiry and Dialogue; TL – Team Learning; ES – Embedded Systems; EM – Empowerment; SC – System connection; PL – Providing leadership.
Shading was meant to highlight significant results.

'Providing leadership', as it relates to leadership issues. By applying a post-hoc test with Bonferroni correction to the significant factors and their interactions, we identified different patterns in perceptions of strategic leadership for learning. In terms of leadership position, we found a significant difference ($p < .001$) in perceptions of providing strategic leadership for learning between staff and principals (mean difference = -0.205 ; Cohen's $d = -0.178$) and between principals and middle managers (mean difference = 0.302 ; Cohen's $d = 0.263$). Therefore, it can be concluded that middle managers' perceptions of the leadership aspect of organisational learning are in line with those of staff members, while those of principals differ from these two groups.

Accordingly, the first hypothesis (H1.1) could not be confirmed: middle managers' views on the aspect of leadership that supports organisational learning were not markedly different from those of staff. Further examining the differences, the second hypothesis (H1.2) was that middle managers have different perceptions of leadership for organisational learning according to organisational-level contingency variables (school type and size). Indeed, post-hoc tests identified further differences related to school type. Specifically, middle managers at primary schools had significantly different ($p < .001$) perceptions of leadership than those at general secondary schools (mean difference = 0.412 ; Cohen's $d = 0.358$), Type 1 vocational secondary schools (mean difference = 0.42 ; Cohen's $d = 0.365$), and Type 2 vocational secondary schools (mean difference = 0.339 ; Cohen's $d = 0.295$).

The next factor that we compared was school size. We only found a significant difference ($p < .001$) in the perceptions of strategic leadership for learning

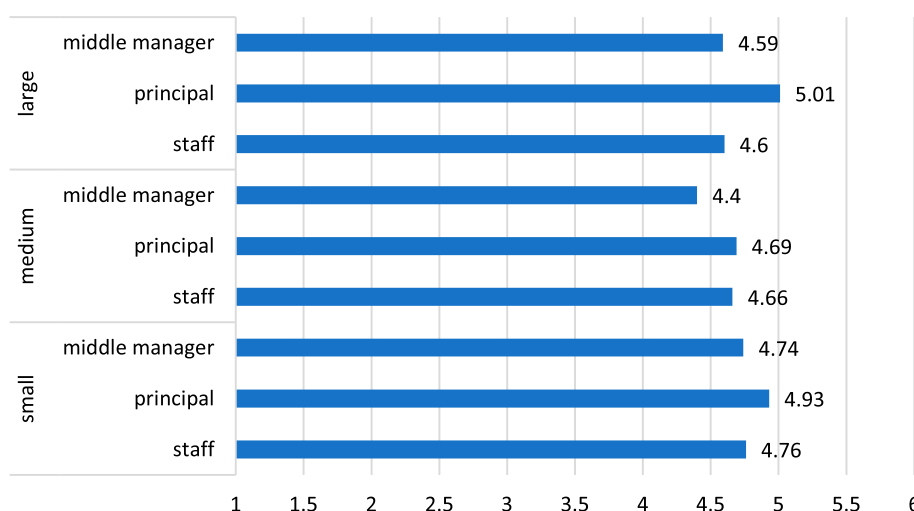


Figure 2. Means of 'Providing Leadership' for different leadership positions in different size of schools.

between small and medium schools (mean difference = 0.224; Cohen's $d = 0.195$). Finally, we examined significant interaction terms (leadership position * school size and type * school size). Figure 2 shows the means of the interaction terms for leadership position and school size.

The analysis revealed a significant interaction between leadership position and school size. The post-hoc test (Bonferroni correction) revealed several significant differences ($p < .001$) in the perception of strategic leadership for learning. First, there was a significant mean difference of 0.362 between staff members at small schools and middle managers at medium schools (Cohen's $d = 0.315$). Second, there was a significant mean difference of -0.355 between staff members at medium schools and principals at large schools (Cohen's $d = -0.308$). Third, there was a significant mean difference between staff members at large schools and principals at small schools (mean difference = -0.331 ; Cohen's $d = 0.287$) and principals at large schools (mean difference = -0.417 ; Cohen's $d = -0.363$). Finally, there was a significant mean difference between principals at small schools and middle managers at medium schools (mean difference = 0.524; Cohen's $d = 0.455$) and between principals at large schools and middle managers at medium schools (mean difference = 0.611; Cohen's $d = -0.531$). Figure 3 shows the means of various categories for the interaction term for school type and size.

When we compared the interaction terms for school type and size, we found significant average differences in 18 comparisons, which can be summarised at the level of overall trends. Within the significant comparisons, small schools tended to score higher than larger schools, and vocational schools scored lower than general secondary schools on the perceptions of strategic leadership for learning. Overall, we can conclude that, based on different organisational-level

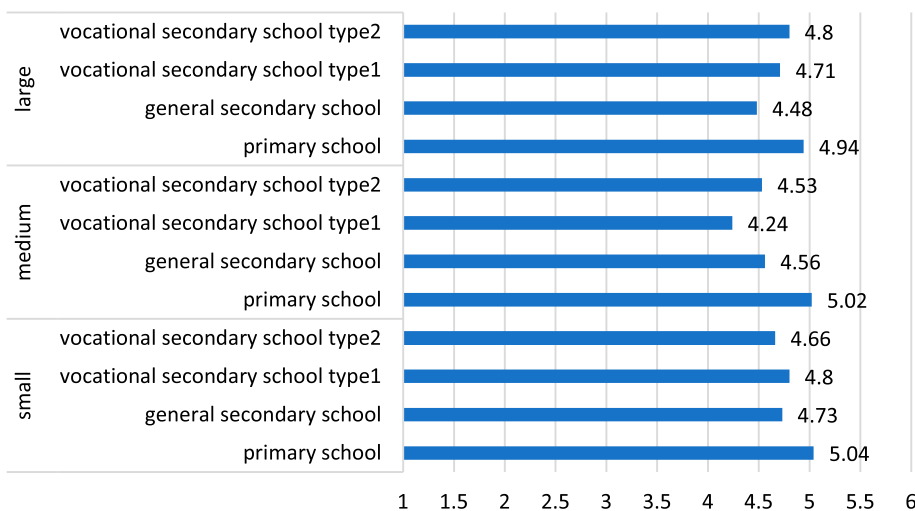


Figure 3. Means of 'Providing Leadership' for different types and sizes of schools.

contingency factors and – to a smaller extent – on leadership position, different patterns emerged in the interpretation of leadership support for organisational learning processes, which confirmed the second hypothesis (H1.2).

Additional roles of middle management

In line with the second research question (RQ2), it is worth investigating the additional roles and responsibilities taken on by teachers in various positions to better understand middle managers' roles in schools according to the previously analysed organisational-level contingency variables. In addition, we hypothesised that middle managers take on additional roles and responsibilities compared to staff members (H2.1). Table 4 shows the percentage of respondents who indicated that they take on additional roles and responsibilities and the degree of association between the variables (contingency table analysis).

The results demonstrated that principals taken on additional tasks to a greater extent than the other two groups, with the preparation of internal institutional evaluations being the most frequently undertaken task. Principals were also active in other areas, sharing responsibility for mentoring colleagues (trainees) and supporting students with middle managers. This confirms the third hypothesis (H2.1), which states that middle managers take on more additional tasks than their subordinates but not more than principals.

The next hypothesis focuses on differences in roles and responsibilities that result from organisational-level contingency factors (H2.2). Mentoring, student support, and institutional assessment are considered internal roles, while other roles are performed outside of school. We focused only on internal roles to explore differences between the groups in additional roles they take on. Figure 4 shows the percentage of middle managers who took on additional internal roles at schools of varied sizes.

Table 4. Percentage of respondents taking on extra roles based on their leadership position.

	Staff	Principal	Middle manager	Measure of association (contingency table)
Mentoring (trainee teachers)	11.40%	23.60%	24.80%	$p < .001$ Cramer's $V = 0.169$
Supporting students	20.70%	25%	24.50%	$p = .004$ Cramer's $V = 0.047$
Preparation of internal institutional evaluation	5%	50.50%	22.20%	$p < .001$ Cramer's $V = 0.462$
Acting as a subject-expert advisor	3.50%	31.30%	7.90%	$p < .001$ Cramer's $V = 0.358$
Matriculation exam chair	6%	20.10%	11.80%	$p < .001$ Cramer's $V = 0.181$
Other	10.80%	12.60%	11%	$p = .327$ Cramer's $V = 0.021$
No extra responsibilities	52.60%	13.80%	28.80%	$p < .001$ Cramer's $V = 0.318$

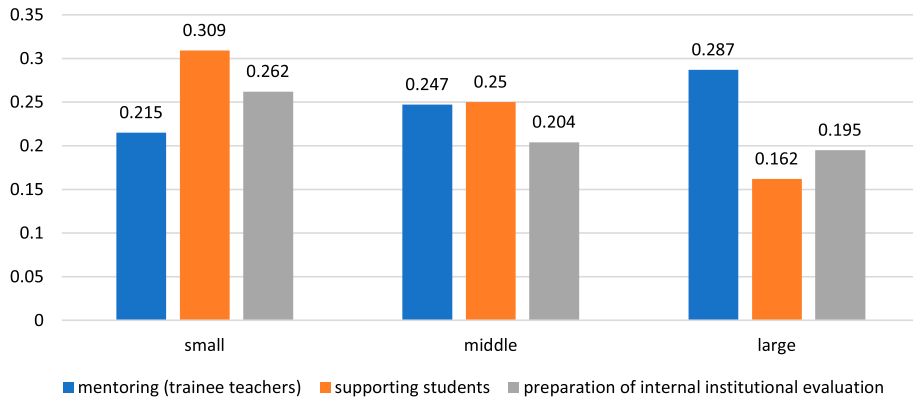


Figure 4. Percentage of middle managers taking on extra internal roles based on the size of schools.

A clear tendency can be seen in Figure 4. At large schools, mentoring roles increased for middle managers, while student support and institutional evaluation roles decreased. Middle managers at smaller schools provided the most support to students, while mentoring was emphasised at larger schools. Figure 5 depicts the percentage of middle managers who took on additional internal roles based on school type.

The results indicate that middle managers' student support role was more prominent at vocational secondary schools than at other types of schools. By contrast, at general secondary schools, they used their leadership capacity for mentoring more than at other types of schools. Finally, middle managers at primary schools supported institutional evaluation processes more than at other types of schools. Based on the analysis, clear patterns in middle managers' adoption of additional internal tasks emerged for different school types and sizes; therefore, the fourth hypothesis was supported (H2.2).

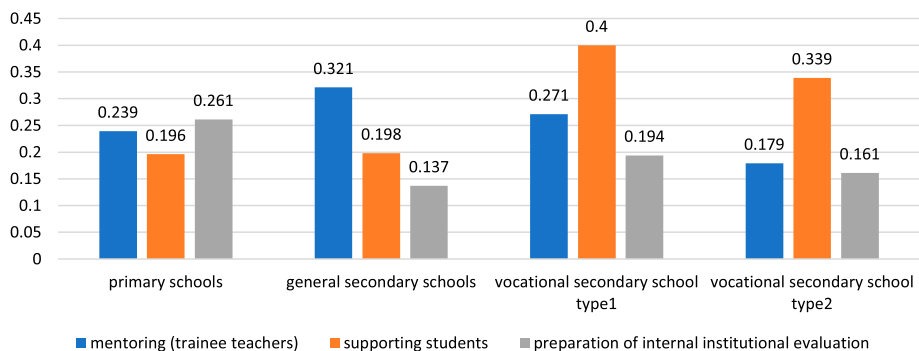


Figure 5. Percentage of middle managers taking on extra internal roles by different types of schools.

Discussion and conclusion

According to a recent systematic literature review by Lipscombe, Tindall-Ford, and Lamanna (2023), little is known about how middle managers operate and learn in schools. The current study provides insight into this research gap by examining and comparing how teachers in different leadership positions perceive organisational learning and their range of roles in light of organisational-level contingency variables (school size and type). Although the results from this study can be considered to be representative of the population of Hungarian teachers, further generalisations should be treated with caution, as the explored questions are highly dependent on national educational systems, laws, and policies. Our analysis shed light on previously unexplored areas of how the role of middle managers can be interpreted in schools; however, further qualitative analysis is required to test our results via case studies. Furthermore, we were only able to collect data based on formal middle management status; thus, at this level of data, we can examine the roles and learning of middle managers in a narrower context.

The results show, that although staff, middle managers, and principals conceptualised organisational learning (in terms of learning organisation behaviour) in a similar manner (established scalar invariance), there were significant differences between their perceptions according to the examined contingency variables. In terms of leadership support for organisational learning, middle managers and staff's perceptions significantly differed from those of principals. The responses of middle managers resembled those of teachers without managerial responsibilities, which indicates that they perceived themselves primarily as teachers, people with pedagogical responsibilities, and part of the teaching staff rather than leaders. Their leadership role was not primarily based on formal frameworks but rather on their subject knowledge and expertise (e.g. as subject team leaders). Middle managers often take on mostly administrative tasks from principals, which often results in role conflict and makes it difficult to assess the credibility and effectiveness of their role in mentoring colleagues.

The only dimension on which principals scored lower than staff and middle managers was 'Embedded systems.' According to Marsick and Watkins (2003), this dimension concerns the development of organisational processes and job characteristics that enable an organisation to identify, store, and share knowledge from everyday practice. The possible impact of middle managers can be identified here, which highlights their potential role in creating both formal and informal learning opportunities through trust building, interpersonal collaboration, and support for professional learning communities (Harris and Jones 2010). This finding underscores the need to strengthen middle managers' supervisory and staff development roles (De Nobile 2018). However, this puts middle managers in Hungary in a particularly difficult position, as the legal

regulatory framework for teachers' professional development and learning focuses on control and accountability.

In addition, we found that middle managers tend to be more valued at smaller schools than at larger schools, although they are not necessarily perceived as a standalone middle management group because of the small number of teachers. Regarding the provision of strategic leadership for learning, middle managers were more likely to apply their strategic role (De Nobile 2018) in contexts with a more cohesive community. Thus, there seems to be a real opportunity for larger organisations to make better use of the middle management function. Larger organisations are more difficult to oversee due to their size compared to smaller organisations; often, the scope of middle managers' responsibilities is limited to disciplinary responsibilities, which could erode their leadership role. In this situation, it is particularly important to clearly define middle managers' tasks and responsibilities, especially in Hungary, where there has been a loss of autonomy at the organisational level.

In sum, the ontological perspective of our study draws attention to the importance of context, of local circumstances, in the context of the study of middle managers' role interpretation. While global education systems support the strengthening of autonomy and flexibility, the centralized educational environment reinforces the power of hierarchy and accountability. However, centralised systems have the advantage of supporting the development of structures and formal roles within the organisation. The Hungarian educational environment, which can be seen as essentially centralised, has a narrow understanding of the role of middle management in schools, defining it only as formal and subject leadership. Our research suggests that in this environment, middle managers see their role as taking on administrative tasks, and thus become less decisive as facilitators of shared goals. Furthermore, the system theory approach of middle managers see the dynamic nature of the role as one of its greatest importance. However, we can conclude that not only leadership position influences perceptions of organisational learning but also school type and size. As a result, middle managers at small primary schools require different strategies than middle managers at large vocational schools. For example, interpersonal cooperation and communication and community building should be emphasised as a focus for middle managers at small primary schools, while connecting to the external environment (through a vocational focus) and facilitating networking appear to be more important for organisational learning at large vocational schools.

Metaphorically speaking, middle managers can fill gaps in a large organisation that principals cannot oversee. However, this means empowering middle managers, which requires principals' trust and support (De Nobile 2018). There is a need to prepare middle managers more consciously for their strategic role (De Nobile 2018) and train principals on how to support them in managing the frequent conflicts that arise from their intermediary role (Lindvig, Lyall, and

Meagher 2019) and provide them with sufficient autonomy to undertake their tasks. Further elaborating on Lipscombe, Tindall-Ford, and Lamanna's (2023) finding, this not only involves preparing middle managers for their strategic role (De Nobile 2018) but also training principals in what Lindvig, Lyall, and Meagher (2019) called the 'art of managing interstitiality'. Given the importance of middle management's role in the 'interstices' between employees and principals (interstices meaning spaces intervening between closely spaced things), their intermediary role in realising the organisational knowledge vision should be emphasised (Nonaka, Krogh, and Voelpel 2006).

Overall, our study has shown that the role of middle managers is dynamically changing therefore their learning is not just formal, but a complex and unique process. We believe that the results from this study can inform leadership development programmes to better prepare principals and middle managers in the future for their roles.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

Project no. 128738 has been implemented with the support provided from the National Research, Development and Innovation Fund of Hungary, financed under the OTKA-K_18 funding scheme.

Notes on contributions

Márta Héreginé Nagy is a second-year doctoral student at the Doctoral School of Education of Eötvös Loránd University. Her doctoral research is on the professional learning of middle leaders and their role in supporting teachers' learning. In addition to the doctoral studies, she has been a full-time head teacher at Géza Gárdonyi Primary School in Ács since 2013. She has a teaching degree, several teaching college degrees, two university degrees and a professional qualification as a teacher leader in public education.

Sándor Lénárd is an associate professor at Eötvös Loránd University Faculty of Education and Psychology (Institute of Education). As a university teacher, he works in teacher education, educational science programmes and school leadership trainings. His research interest covers educational innovations, adaptive pedagogy, formative assessment and organisational and leadership research.

László Horváth is an economist-andragogue and works as an assistant professor at ELTE PPK Institute of Education. He received his PhD in 2019. His research focuses on the leadership and management issues of educational institutions, mainly on the study of learning organisational behaviour. He teaches in teacher education and teacher CPD, pedagogy and human resources counsellor programmes.

Nóra Rapos is an associate professor with habilitation at the Institute of Education at the Faculty of Education and Psychology at Eötvös Loránd University (ELTE) in Budapest. Head

of Teacher Training at the ELTE Faculty of Pedagogy and Psychology and one of the lecturers in teacher education and teacher training. Her research and publications focus on teacher professional development and learning, international comparisons of teacher education and support for adaptive learning processes. In addition to her teaching and research activities, she participates in national professional organisations for the development of teacher education and in institutional development processes. She is a leader and member of several grant projects that interpret individual, meso- and macro-level processes of teacher learning. She is a member of scientific communities, participates in international conferences and professional collaborations. Also she is the editor-in-chief of the double blind peer-reviewed scientific journal called: Teacher Education and Learning.

Data availability statement

The data that support the findings of this study are available from the principal investigator, NR, upon reasonable request.

References

- Adey, Ken. 2000. "Professional Development Priorities: The Views of Middle Managers in Secondary Schools." *Educational Management & Administration* 28 (4): 419–431. <https://doi.org/10.1177/0263211X000284005>.
- Adey, Philip. 2006. "A Model for the Professional Development of Teachers of Thinking." *Thinking Skills and Creativity* 1 (1): 49–56. <https://doi.org/10.1016/j.tsc.2005.07.002>.
- Aouad, Jennifer, and Fabio Bento. 2020. "A Complexity Perspective on Parent–Teacher Collaboration in Special Education: Narratives from the Field in Lebanon." *Journal of Open Innovation: Technology, Market, and Complexity* 6 (1): 4. <https://doi.org/10.3390/joitmc6010004>.
- Au, Loretta, Nigel Wright, and Christopher Botton. 2003. "Using a Structural Equation Modelling Approach (SEM) to Examine Leadership of Heads of Subject Departments (HODs) as Perceived by Principals and Vice-Principals, Heads of Subject Departments and Teachers within 'School Based Management' (SBM) Secondary Schools: Some Evidence from Hong Kong." *School Leadership & Management* 23 (4): 481–498. <https://doi.org/10.1080/1363243032000150999>.
- Bassett, Martin, and Joanne Robson. 2017. "The Two Towers: The Quest for Appraisal and Leadership Development of 'Middle' Leaders Online" *Journal of Open, Flexible and Distance Learning* 21 (2): 20–30. <https://doi.org/10.61468/jofdl.v21i2.308>.
- Battilana, Julie, Bernard Leca, and Eva Boxenbaum. 2009. "2 How Actors Change Institutions: Towards a Theory of Institutional Entrepreneurship" *Academy of Management Annals* 3 (1): 65–107. <https://doi.org/10.5465/19416520903053598>.
- Bennett, Nigel, Philip Woods, Christine Wise, and Wendy Newton. 2007. "Understandings of Middle Leadership in Secondary Schools: A Review of Empirical Research."

- School Leadership & Management* 27 (5): 453–470. <https://doi.org/10.1080/13632430701606137>.
- Bento, Fabio, Tayo Adenusi, and Puspa Khanal. 2023. "Middle Level Leadership in Schools: A Scoping Review of Literature Informed by a Complex System Perspective." *International Journal of Leadership in Education* 1–27. <https://doi.org/10.1080/13603124.2023.2234329>.
- Biggart, Nicole Woolsey. 2015. "Is the New Institutionalism a Theory?" Unpublished. <https://doi.org/10.13140/RG.2.1.2470.6008>.
- Brown, Marie, Bill Boyle, and Trudy Boyle. 2002. "Professional Development and Management Training Needs for Heads of Department in UK Secondary Schools." *Journal of Educational Administration* 40 (1): 31–43. <https://doi.org/10.1108/09578230210415634>.
- Bryant, Darren A., and Chunping Rao. 2019. "Teachers as Reform Leaders in Chinese Schools." *International Journal of Educational Management* 33 (4): 663–677. <https://doi.org/10.1108/ijem-12-2017-0371>.
- Burns, Tracey, and Florian Köster. 2016. "Modern Governance Challenges in Education." In *Governing Education in a Complex World*, 17–39. Paris: OECD. <https://doi.org/10.1787/9789264255364-3-en>.
- Bush, Tony. 2008. *Leadership and Management Development in Education*. London: SAGE Publications. <https://doi.org/10.4135/9781446213605>.
- Busher, Hugh. 2005. "Being a Middle Leader: Exploring Professional Identities." *School Leadership & Management* 25 (2): 137–153. <https://doi.org/10.1080/13632430500036231>.
- Cardno, Carol, Unitec Institute of Technology and Core Education, Auckland, New Zealand, and Joanne Robson. 2016. "Realising the Value of Performance Appraisal for Middle Leaders in New Zealand Secondary Schools." *Research in Educational Administration & Leadership* 1 (2): 229–254. <https://doi.org/10.30828/real/2016.2.3>.
- Chen, Fang Fang. 2007. "Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance." *Structural Equation Modeling: A Multidisciplinary Journal* 14 (3): 464–504. <https://doi.org/10.1080/10705510701301834>.
- Chrappán, Magdolna, Erika Kopp, and Csilla Pesti. 2020. "Initial Teacher Education in Hungary: Issues, Policies, Practices." *Eastern European Journal of Transnational Relations* 4 (1): 49–74. <https://doi.org/10.15290/eejtr.2020.04.01.03>.
- De Bot, K. 2008. "Introduction: Second Language Development as a Dynamic Process." *The Modern Language Journal* 92 (2): 166–178. <https://doi.org/10.1111/j.1540-4781.2008.00712.x>.
- De Nobile, John. 2018. "Towards a Theoretical Model of Middle Leadership in Schools." *School Leadership & Management* 38 (4): 395–416. <https://doi.org/10.1080/13632434.2017.1411902>.
- Dinham, Stephen. 2007. "The Secondary Head of Department and the Achievement of Exceptional Student Outcomes." *Journal of Educational Administration* 45 (1): 62–79. <https://doi.org/10.1108/09578230710722458>.
- Evetts, Julia. 2011. "A New Professionalism? Challenges and Opportunities" *Current Sociology* 59 (4): 406–422. <https://doi.org/10.1177/0011392111402585>.
- Fitzgerald, Tanya, and Helen Gunter. 2006. "Leading Learning: Middle Leadership in Schools in England and New Zealand." *Management in Education* 20 (3): 6–8. <https://doi.org/10.1177/08920206060200030201>.
- Forde, Christine, Deirdre Torrance, Margery McMahon, and Alison Mitchell. 2021. "Middle Leadership and Social Justice Leadership in Scottish Secondary Schools: Harnessing the Delphi Method's Potential in a Participatory Action Research Process." *International Studies in Educational Administration* 49 (3): 103–121.

- Glover, Derek, Denis Gleeson, Gerry Gough, and Michael Johnson. 1998. "The Meaning of Management: The Development Needs of Middle Managers in Secondary Schools." *Educational Management & Administration* 26 (3): 279–292. <https://doi.org/10.1177/0263211X98263006>.
- Glover, Derek, David Miller, Maureen Gambling, Gerry Gough, and Michael Johnson. 1999. "As Others See Us: Senior Management and Subject Staff Perceptions of the Work Effectiveness of Subject Leaders in Secondary Schools." *School Leadership & Management* 19 (3): 331–344. <https://doi.org/10.1080/13632439969087>.
- Gronn, Peter. 2002. "Leader Formation." In *Second International Handbook of Educational Leadership and Administration*, edited by Kenneth Leithwood, Philip Hallinger, Gail C. Furman, Kathryn Riley, John MacBeath, Peter Gronn, and Bill Mulford, 1031–1070. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-010-0375-9_36.
- Grootenboer, Peter, Christine Edwards-Groves, and Karin Rönnerman. 2015. "Leading Practice Development: Voices from the Middle." *Professional Development in Education* 41 (3): 508–526. <https://doi.org/10.1080/19415257.2014.924985>.
- Gurr, David, and Lawrie Drysdale. 2013. "Middle-level Secondary School Leaders: Potential, Constraints and Implications for Leadership Preparation and Development." *Journal of Educational Administration* 51 (1): 55–71. <https://doi.org/10.1108/09578231311291431>.
- Hairon, Salleh, Jonathan Wee Pin Goh, and Catherine Siew Kheng Chua. 2015. "Teacher Leadership Enactment in Professional Learning Community Contexts: Towards a Better Understanding of the Phenomenon." *School Leadership & Management* 35 (2): 163–182. <https://doi.org/10.1080/13632434.2014.992776>.
- Hargreaves, Andy, and Michael Fullan. 2012. *Professional Capital: Transforming Teaching in Every School*. New York: Teacher College.
- Harris, Alma, and Michelle Jones. 2010. "Professional Learning Communities and System Improvement." *Improving Schools* 13 (2): 172–181. <https://doi.org/10.1177/1365480210376487>.
- Harris, Alma, Michelle Jones, Nashwa Ismail, and Dong Nguyen. 2019. "Middle Leaders and Middle Leadership in Schools: Exploring the Knowledge Base (2003–2017)." *School Leadership & Management* 39 (3–4): 255–277. <https://doi.org/10.1080/13632434.2019.1578738>.
- Horváth, László. 2022. "A Tanulószervezet Kontextus-Adaptált Modellje a Magyar Köznevelésben a Pedagógusok Munkahelyi Elégedettségének Függvényében." *Iskolakultúra* 32 (4): 48–69. <https://doi.org/10.14232/iskkult.2022.4.48>.
- Jørgensen, Jes K., Rajika L. Kuruwita, Daniel Harsono, Troels Haugbølle, Lars E. Kristensen, and Edwin A. Bergin. 2022. "Binarity of a Protostar Affects the Evolution of the Disk and Planets." *Nature* 606 (7913): 272–275. <https://doi.org/10.1038/s41586-022-04659-4>.
- Kahrens, Marion, and Dieter H. Früauff. 2018. "Critical Evaluation of Nonaka's SECI Model." In *The Palgrave Handbook of Knowledge Management*, edited by Jawad Syed, Peter A. Murray, Donald Hislop, and Yusra Mouzoughi, 53–83. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-71434-9_3.
- Kelchtermans, Geert. 2009. "Who I Am in How I Teach Is the Message: Self-Understanding, Vulnerability and Reflection." *Teachers and Teaching* 15 (2): 257–272. <https://doi.org/10.1080/13540600902875332>.
- Kemmis, Stephen, Hannu L. T. Heikkinen, Göran Fransson, Jessica Aspfors, and Christine Edwards-Groves. 2014. "Mentoring of New Teachers as a Contested Practice: Supervision, Support and Collaborative Self-Development." *Teaching and Teacher Education* 43:154–164. <https://doi.org/10.1016/j.tate.2014.07.001>.
- Knapp, Michael S., Michael A. Copland, Meredith I. Honig, Margaret L. Plecki, and Bradley S. Portin. 2010. *Learning-Focused Leadership and Leadership Support: Meaning and Practice in Urban Systems*. Seattle, WA: Center for the Study of Teaching and Policy (CTP).

- Kopp, Erika, and Orsolya Kálmán. 2023. "Teacher Education in Hungary: Between Autonomy and Control." In *The Palgrave Handbook of Teacher Education in Central and Eastern Europe*, edited by Marta Kowalczyk-Wałędziak, Roza A. Valeeva, Marija Sablić, and Ian Menter, 53–81. London: Palgrave Macmillan. https://doi.org/10.1007/978-3-031-09515-3_3.
- Korthagen, Fred. 2016. "Inconvenient Truths About Teacher Learning: Towards Professional Development 3.0." *Teachers and Teaching* 1–19. <https://doi.org/10.1080/13540602.2016.1211523>.
- Larsen-Freeman, Diane, and Lynne Cameron. 2008. "Research Methodology on Language Development from a Complex Systems Perspective." *The Modern Language Journal* 92 (2): 200–213. <https://doi.org/10.1111/j.1540-4781.2008.00714.x>
- Leask, Marilyn, and Ian Terrell. 2014. *Development Planning and School Improvement for Middle Managers*. New York: Routledge. <https://doi.org/10.4324/9781315866390>.
- Leithwood, Ken, and Pat McAdie. 2007. "Teacher Working Conditions That Matter." *Education Canada* 47 (2): 42–45.
- Leithwood, Kenneth, Sarah Patten, and Doris Jantzi. 2010. "Testing a Conception of How School Leadership Influences Student Learning." *Educational Administration Quarterly* 46 (5): 671–706. <https://doi.org/10.1177/0013161X10377347>.
- Lindvig, Katrine, Catherine Lyall, and Laura R. Meagher. 2019. "Creating Interdisciplinary Education Within Monodisciplinary Structures: The Art of Managing Interstitiality." *Studies in Higher Education* 44 (2): 347–360. <https://doi.org/10.1080/03075079.2017.1365358>.
- Lipscombe, Kylie, Sharon Tindall-Ford, and Jodi Lamanna. 2023. "School Middle Leadership: A Systematic Review." *Educational Management Administration & Leadership* 51 (2): 270–288. <https://doi.org/10.1177/1741143220983328>.
- MacLennan, David, Ivor F. Goodson, and Andy Hargreaves. 1997. "Teachers' Professional Lives." *Canadian Journal of Education / Revue Canadienne de L'éducation* 22 (2): 226. <https://doi.org/10.2307/1585915>.
- Marsick, Victoria J., and Karen E. Watkins. 2003. "Demonstrating the Value of an Organization's Learning Culture: The Dimensions of the Learning Organization Questionnaire." *Advances in Developing Human Resources* 5 (2): 132–151. <https://doi.org/10.1177/1523422303005002002>.
- Mowles, Chris. 2021. *Complexity: A Key Idea for Business and Society*. London: Routledge. <https://doi.org/10.4324/9781003002840>.
- Nonaka, Ikujiro, Georg von Krogh, and Sven Voelpel. 2006. "Organizational Knowledge Creation Theory: Evolutionary Paths and Future Advances." *Organization Studies* 27 (8): 1179–1208. <https://doi.org/10.1177/0170840606066312>.
- Poultney, Val. 2007. "The Role of the Effective Subject Leader: Perspectives from Practitioners in Secondary Schools." *Management in Education* 21 (2): 8–14. <https://doi.org/10.1177/0892020607076655>.
- Qian, Haiyan, Allan Walker, and Yang Xiaowei. 2017. "Building and Leading a Learning Culture among Teachers: A Case Study of a Shanghai Primary School." *Educational Management Administration & Leadership* 45 (1): 101–122. <https://doi.org/10.1177/1741143215623785>.
- Rosseel, Y. 2012. "lavaan: An R Package for Structural Equation Modeling." *Journal of Statistical Software* 48: 1–36. <https://doi.org/10.18637/jss.v048.i02>.
- Sachs, Judyth. 2016. "Teacher Professionalism: Why Are We Still Talking About It?" *Teachers and Teaching* 22 (4): 413–425. <https://doi.org/10.1080/13540602.2015.1082732>.
- Soekijad, Maura, Bart van den Hooff, Marlous Agterberg, and Marleen Huysman. 2011. 'Leading to Learn in Networks of Practice: Two Leadership Strategies'. *Organization Studies* 32 (8): 1005–1027. <https://doi.org/10.1177/0170840611410834>.
- Stacey, Ralph D. 2009. *Complexity and Organizational Reality: Uncertainty and the Need to Rethink Management After the Collapse of Investment Capitalism*. 2nd ed. London: Routledge. <https://doi.org/10.4324/9780203863657>.

- Stoll, Louise, Ray Bolam, Agnes McMahon, Mike Wallace, and Sally Thomas. 2006. "Professional Learning Communities: A Review of the Literature." *Journal of Educational Change* 7 (4): 221–258. <https://doi.org/10.1007/s10833-006-0001-8>.
- Stoll, Louise, Chris Brown, Karen-Spence Thomas, and Carol Taylor. 2015. "Perspectives on Teacher Leadership for Evidence-Informed Improvement in England." *Leading and Managing* 21 (2): 76–91.
- Szivák, Judit, Zoltán Rónay, Judit Saád, and Ágnes Fazekas. 2019. "A Pedagógusok Szakmai Fejlődését, Tanulását Meghatározó Rendszerszabályozási Környezet." *Educatio* 28 (4): 829–837. <https://doi.org/10.1556/2063.28.2019.4.13>.
- Talbert, Joan E. 2010. "Professional Learning Communities at the Crossroads: How Systems Hinder or Engender Change." In *Second International Handbook of Educational Change*, edited by Andy Hargreaves, Ann Lieberman, Michael Fullan, and David Hopkins, 555–571. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-90-481-2660-6_32.
- Tay, Hui Yong, K. H. K. Tan, C. C. Deneen, W. S. Leong, Gavin W. Fulmer, and Gavin T. L. Brown. 2020. 'Middle Leaders' Perceptions and Actions on Assessment: The Technical, Tactical and Ethical'. *School Leadership & Management* 40 (1): 45–63. <https://doi.org/10.1080/13632434.2019.1582016>.
- Voogt, Joke, Therese Laferrière, Alain Breuleux, Rebecca C. Itow, Daniel T. Hickey, and Susan McKenney. 2015. "Collaborative Design as a Form of Professional Development." *Instructional Science* 43 (2): 259–282. <https://doi.org/10.1007/s11251-014-9340-7>.
- Wahlstrom, Kyla L., and Karen Seashore Louis. 2008. "How Teachers Experience Principal Leadership: The Roles of Professional Community, Trust, Efficacy, and Shared Responsibility." *Educational Administration Quarterly* 44 (4): 458–495. <https://doi.org/10.1177/0013161X08321502>.
- Watkins, Karen E., and Ronald M. Cervero. 2000. "Organizations as Contexts for Learning: A Case Study in Certified Public Accountancy." *Journal of Workplace Learning* 12 (5): 187–194. <https://doi.org/10.1108/13665620010336161>.