Károly Eszterházy Catholic University
Doctoral School of Educational Sciences



Thesis Booklet

Dr Tibor Baráth

School leadership competencies in the knowledge society

For a Ph.D. thesis

Supervisor:
Prof. Dr. emeritus Béla Pukánszky

Co-supervisor:
Prof. Dr. emeritus Gábor Halász

Director of the Doctoral School of Educational Sciences:
Prof. Dr. habil. Zoltán Szűts

Programme Director of the Doctoral School of Educational Sciences:
Dr. Enikő Szőke-Milinte PhD

EGER, 2026

CONTENTS

1. Background and significance of the research – introduction and problem statement, structure of the thesis.....3

1.1. Introductory remarks 3

1.2. Structure of the thesis 6

2. Research aims, questions, and methodology.....14

3. Research methodology 19

3.1. Presentation of the methodological approach.....19

3.2. Key methods and models applied in the research phases 22

3.3. Design-based research as the methodological framework for the research phases 28

4. Scientific results (Theses) 31

4.1. Thesis 1: The definability of competencies for successful school leadership in the knowledge society 32

4.2. Thesis 2: Demonstrating the organic link between the functioning of a learning organisation and Central5 leadership competencies 35

4.3. Thesis 3: Validation of Central5 38

4.4. Thesis 4: The relationship between the learning organisation and the learning environment ..41

4.5. Thesis 5: Linking school leadership competency expectations and school autonomy 45

5. The scientific and practical significance of the findings.....52

6. Authors' publications in the field 55

7. Selected references.....58

1. BACKGROUND AND SIGNIFICANCE OF THE RESEARCH – INTRODUCTION AND PROBLEM STATEMENT, STRUCTURE OF THE THESIS

1.1. Introductory remarks

Modern, postmodern society is characterised by strong organisational embeddedness. Growing up (nursery, kindergarten), schooling (its various levels and forms), participation in the world of work, and in many cases leisure activities (cultural, sporting, charitable, etc.) all bind people to organisations. The operational characteristics and quality of these organisations significantly influence the quality of human life. It is therefore not surprising that the effectiveness and success of organisational functioning have long been a subject of interest to researchers, theorists, and, often, to ordinary people as well. Theories and models have been developed regarding organisations and

their management to help us better understand their functioning and behaviour (see, for example, *Georgopoluos & Tannenbaum*, 1957; *Bennis*, 1966; *Lawrence & Lorsch*, 1967); *Campbell*, 1977; *Katz & Kahn*, 1978; *Cameron & Whetten*, 1983; *Quinn & Rohrbaugh*, 1983; *Faerman & Quinn*, 1985). Issues of organisational effectiveness, success and efficiency also arise in the world of education. (See, for example: *Coleman et al.*, 1966, 1981; *Jencks et al.*, 1972; *Mortimore et al.*, 1988; *Schereens,* 1992).

The role of the chief executive, and more broadly that of the leadership, is of key importance to the functioning of organisations. It therefore stands to reason to ask what role the leader, or the leadership, plays in the successful operation of organisations and institutions, and, on this basis, what knowledge – or, to be precise, what competencies – are required for the successful governance of organisations and schools; what roles must be fulfilled, what behaviour must be demonstrated, and what system of activities must be carried out? (See: *Taylor*, 1947; *Quinn et al.*, 1996; *Jirasinghe & Lyons*, 1996; *National Association of Elementary School Principals*, 2008; *Ontario competences*;

UNESCO, 2006; *Wilson, Lenssen & Hind*, 2006). Defining leadership roles and competencies, and outlining their manifestations and activities, are key issues in leadership development.

Linking organisational functioning and leadership is particularly important in the rapidly changing, complex world in which we live, a world that often requires new interpretations different from the past, and is fraught with uncertainty. In this thesis, I attempt to demonstrate how school leadership competencies can be defined for schools operating in such an environment. This is important because the transition from an industrial society to a knowledge society, the development of the science – and, more specifically, in the case of schools, the development of the learning science – generates significant changes in relation to schooling (*Sawyer*, 2008), the functioning institutional system, and individual schools. This change has a strong influence on the activities of school leaders and the expectations placed upon them. Defining the competencies of school leadership is necessary for planning and implementing selection, training, and leadership development.

We must also recognise that it is not enough to establish these competency requirements once; they must be regularly reviewed and adapted to changing social needs and the environment. Although national responses (standards for leadership) have emerged in recent decades (particularly since the 1990s), there is a lack of a comprehensive approach that takes its starting point in the knowledge society and seeks to address these issues. With this thesis, I wish to make a modest contribution towards addressing this gap.

1.2. Structure of the thesis

My thesis consists of nine chapters. The first chapter sets out the rationale for the research (why it is important to define the competencies of school leadership in the knowledge society), a brief overview of the thesis's structure, the background and concept of the thesis, and a brief description of the research phases. The thesis is based on an integrated examination of three research phases. The first two are developmental research aimed at developing the Central5 school leadership competency framework

[Quality School Leadership for Effective Learning (LLL-S-L), International Cooperation for School Leadership (ICSL)], whilst the third is the development of a new learning organisational model for schools [Learning Organisational Model for Schools (LOM4S)].

In the second chapter, I present the logical framework of the thesis, the factors from which the school leadership competencies that function successfully in the knowledge society can be derived, as well as a description of the mechanism of action that leads from school leadership competencies, through the shaping of an environment conducive to optimising learning, to the development of student competencies. This chapter also presents the research question.

In the third chapter, I describe the research approach and methodology I have employed, along with the theoretical foundations that underpin them. I examine in detail research with similar objectives (aimed at developing a competency framework), the concept of competence/ competency and its interpretation, and, as a result, the definition of the interpretation used in this thesis. This chapter

provides an explanation of developmental research and justifies why the research I have conducted falls into this category. Furthermore, I present an explanation of design-based research (DBR), a critique of it, and a justification for choosing this methodology as the methodological framework for my research. Finally, this chapter presents the models I have adapted for the research phases (de-mand-driven competence development model (DDCDM), behavioural competence model (RDA), and competing values framework (CVF):

Chapter Four discusses the specific methods, tools, and procedures used. Here, I examine the models employed during each research phase and how they were adapted. Standardised development workshops play a key role in every phase as a research method, which is why I discuss them in detail. This chapter presents additional tools (e.g., questionnaires) and describes the triangulation applied in each phase. In the fourth chapter, I present the concept and procedure for developing the learning organisation model, and here I address the validation of the Central5 compe-tency framework and the LOM4S model.

The fifth chapter addresses the interpretation of learning in the knowledge society and, based on key characteristics, provides a targeted outline of the learner competencies required in this context. It is obvious that in a rapidly changing world such as that of the 21st century, it is not possible to define learner competencies (which schools must develop) for a period spanning centuries. It is therefore essential to identify the factors that generally determine social expectations, including labour-market demands. In analysing this context, I examined the effects of exponentiality, complexity, globalisation, and the technological environment, as well as the relationship between the worlds of learning and work. Building on this contextual analysis, I further examined possible models and approaches for the competencies learners need to succeed in society in the 21st century. Of particular importance here are the model by *Fadel and Trilling* (2009) and its international applications, the expectations of the WEF's annual report for labour market analysis, and documents reflecting the OECD's approach (e.g., the OECD Learning Compass 2030 and the OECD Global Competence Model).

The sixth chapter – building on the previous one – outlines the characteristics of the learning environment necessary for the acquisition of learner competences. As part of this, I examine the characteristics of the mental and physical environment required for learners' learning, the relationship between learning and innovation, and learning aimed at the development of the whole person (*Darling-Hammond et al.*, 2020). The environment includes the phenomenon of digitalisation, digital competencies, and the emergence of related expectations (*Redecker*, 2017; *Vuorikari et al.*, 2022). I conclude the chapter by examining the relationship between the learning environment and school leadership.

Chapter 7 examines the kind of school organisation that can serve as an optimal learning environment for students' development and growth. This chapter examines in depth the characteristics of learning organisations and functioning schools as learning organisations (*Senge*, 1994/1998, 1990/2006; *Argyris & Schön*, 1978, 1996; *Visser*, 2007). The emergence and critique of the concept and model of learning organisations play a prominent role (*Belet*, 2009).

Here, I analyse the results of some particularly important studies on schools, which explore the relationships among the functioning of learning organisations, the characteristics of school leadership, and student outcomes (*Mulford & Silins*, 2003; *Pol et al.*, 2011, 2013; *Baráth*, 2014). My aim with these analyses is to identify what kind of school organisation is capable of optimising student learning. In this chapter, I also present the LOM4S model in detail (*Baráth*, *ed*., 2015) and its validation, before examining the relationship between the functioning of learning organisations and the learning environment based on empirical data, primarily from the third research phase. In this chapter, I discuss the application of the OECD learning organisation model in Wales (*Koll & Stoll*, 2016). Chapters 5–7, while indirect, clearly identify expectations regarding the competencies of school leaders, following the logical chain presented in Chapter 2, which aims to define the school leadership competencies required in the knowledge society.

Chapter 8 examines in depth and detail the role of school leadership competencies, their impact on students'

learning, and leadership standards. In the first part of the chapter, drawing on a review of the literature, I examine the impact of school leadership on students' learning outcomes and development (e.g., *Leitner*, 1994; *Bosker & Witziers*, 1996; *Leithwood & Jantzi*, 1999; *Day et al*., 2009). Here we can see that school leadership functions as the second most important school factor. In the following, I examine research-based standards of school leadership competence (USA, Canada, Great Britain) that reveal common expectations (*Day et al*., 2010; *Louis et al*., 2010). In this chapter, I present in detail the process based on the demand-driven competence development model and behavioural competency expectations, which led to the creation of the Central5 school leadership competency framework. This chapter also examines the relationship between competency expectations and school autonomy, as well as exploring the connection between competence expectations derived from the functioning of learning organisations and Central5.

Chapter Nine is devoted to a discussion of the findings. Based on the results of the preceding chapters, I provide

an answer to the research question here (whether and how school leadership competencies can be defined in the knowledge society). I summarise and demonstrate that, by following the logical chain defined in my thesis, we would essentially have arrived at the same competencies as those in Central5, and furthermore, why the results of the model and the methodology of the development process itself can be considered generalisable. I conclude the chapter with a brief summary of the challenges facing the field and, by extension, directions for further research.

The chapters are preceded by a list of figures and tables, followed by a list of references, and then by the appendices, which, aligned with the individual chapters, provide deeper insight into the research and development processes and enhance the transparency of the thesis.

2. RESEARCH AIMS, QUESTIONS, AND METHODOLOGY

The overarching aim of my research *is to define the leadership competencies required for the successful management of schools*, *embedded within the context of the socio-economic processes taking place in the knowledge society*. To this end, it became necessary to explore the system of influences through which school leadership affects the development of students' competencies via complex interactions. This is because the fundamental aim of the school – based on the social contract and the division of labour applicable to it – is to prepare students for personal fulfillment and successful integration into society.

Based on this overarching aim, the *main research question* was to determine: *What competencies must school leadership possess in order to establish and operate a school (learning environment) in which students can acquire the competencies necessary for success in the knowledge society*?

In order to answer this main research question, I had to define the logic of the search for answers, the starting point of which is the competencies required of pupils in the knowledge society, the context of which is the environment in which learning takes place, and the endpoint of which is the definition of the leadership competencies set as the goal. To this end, the following questions must be answered:

a) What competencies must learners have in a knowledge society?

b) What is the actual learning environment like that enables the acquisition of learner skills?

c) What kind of organisation can establish the learning environment described above, which enables students to optimally develop their competencies?

d) What kind of leadership can create, establish, and operate an organisation (school) that can optimise the learning opportunities for students, i.e., create an optimal learning environment? What kind of leadership competencies are necessary for these?

The approach to answering the research question, i.e. the research concept, is illustrated in Figure 1.

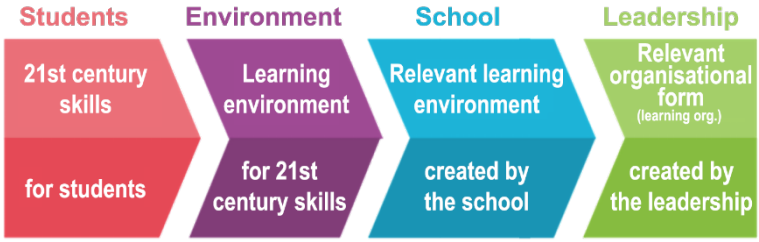


Figure 1: The research concept

Following the logic of Figure 1, I defined the learner competencies required in the knowledge society primarily by drawing on an analysis of the literature (*Fadel & Trilling*, 2009; OECD Learning Compass, etc.). From these competencies, I inferred the learning environment, which I analysed separately (*Barrett et al.*, 2015; *OECD*, 2019; *Darling-Hammond et al.*, 2020) based on the literature. From the learning environment, the characteristics of the organisation capable of creating this environment for learners became apparent. Based on these characteristics, this

could be identified as functioning as a learning organisation. At this stage, I drew on the results of the third phase of my research, which aimed to develop a learning organisation model for schools. From the development of the learning organisation model and its detailed description, it was possible to identify the characteristics (competencies) of school leadership that are necessary for the creation and ongoing operation of such an organisation (learning organisation).

In real life, in school practice, the processes run in the opposite direction to those depicted in Figure 1. Figure 2 illustrates the mechanism of action of competent leadership, which, through teachers and the organisation, creates the appropriate learning environment, enabling students to acquire the competencies expected by the knowledge society.

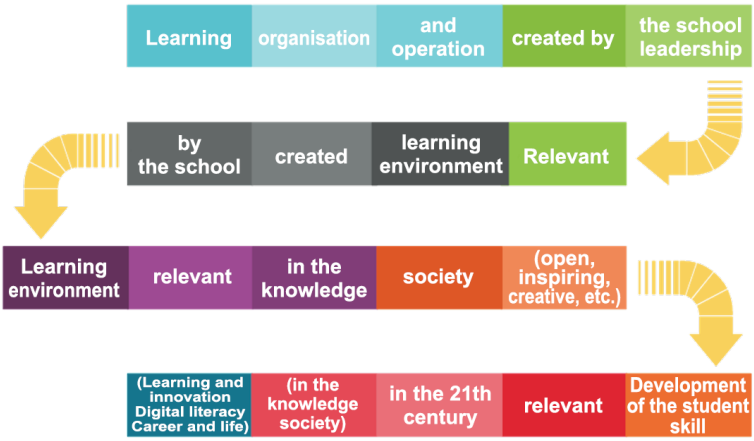


Figure 2: The mechanism of action of leadership

The concept and mechanism of action presented in Figures 1 and 2 are linked in a synergistic manner. They enable the definition and adjustment of school leadership competencies, whilst knowledge of the mechanism of action enables examination of how these competencies function in practice and their effectiveness, thereby facilitating the planning and implementation of interventions to optimise the process.

Achieving the overarching aim of the research and answering the main research question presupposes that the

answer covers the specific procedures and methods for defining leadership competencies that are applicable in practice. Therefore*, an additional objective is linked to the overarching aim: the development of a procedure* and *methodology for defining school leadership competencies* that can be applied in countries moving towards a knowledge society (which are at different stages of this transition and exhibit cultural and educational policy differences).

3. RESEARCH METHODOLOGY

3.1. Presentation of the methodological approach

In my focused discussion of the methodology, I highlight the interpretation of the thesis's key concept. In Chapter 3 of the thesis, I examine the concept in depth and in detail through a review of the literature (e.g., *Chomsky*, 1965, 2006; *McClelland,* 1973; *Boyatzis,* 1982; *Parry,* 1996; *Spencer & Spencer,* 1993). Here, I record only the interpretation that appears consistently throughout the research

phases. At every stage of the research, two factors determined our understanding of competence. *We linked competence to behaviour*. According to our interpretation, *behaviour is the active manifestation of competencies* (*Abari & Baráth*, 2010, pp. 8–9; *Kirkham & Révai*, 2013, pp. 23–25). Furthermore, the manifestation and expression of competencies can be captured in two ways. During the *process*, behaviour (individual and organisational) manifests, whilst in the case of *the outcome*, it is the products and results produced during specific activities. These two are naturally linked, as a specific set of activities leads to defined results. This interpretation is also important in terms of the choice of methods and models, as it justified the use of the demand-driven competence development model (DDCDM) for identifying competencies, as well as the use of the Role Diagrammatic Approach (RDA) behavioural competency model to describe school leadership and organisational profiles, as well as to validate the results of the Central5 competency framework.

As stated in point 2, in addition to the main aim of my research (defining school leadership competencies in the

knowledge society), I also aim to present the methodology of the procedure. In this sense, the methods employed can be classified more as knowledge-building than as classical research methods. The methods applied or proposed in the various phases of the research differed from the traditional research methodological approach, in which the researcher or research team formulates one or more research questions and related hypotheses, and then uses appropriate tools to collect and analyse data in order to decide whether to accept or reject the hypotheses, thereby answering the research questions. The methods and methodology employed were based on the involvement of the groups concerned, in order to gain an in-depth understanding of the subject under investigation through communication with them, to explore the aspirations of the various interest groups, and, building on this, to develop a common position, which led to the development of the intended output (a competency framework for school leadership, a learning organisation model for schools). It can therefore be described as a process of knowledge, model, and system building, made possible by a purposefully selected methodology.

3.2. Key methods and models applied in the research phases

Based on the points outlined in the previous paragraph, I have concluded that the methodology chapter of my thesis presents the models used in the research and, through them, the theoretical background as well. In Table 1, I summarise the methods and models used across the various phases of the research and briefly present the models, as well as the workshop as a research method.

The Demand-Driven Competence Development Model (DDCDM): A model that enables employers to identify the competence requirements of the labour market and, building on this, to develop the required competencies. A key feature of its application is the involvement of stakeholders in the process, as well as the systematic analysis of available research findings and their supplementation where necessary. The model originated in the UK around the turn of the millennium, when the labour market was divided into 25 sectors, and each sector was overseen by a Sector Skills Council that oversaw the development of the competencies relevant to that sector (*Leitch Review*, 2006;

LLUK, 2006). I adapted the model for use in the research phases.

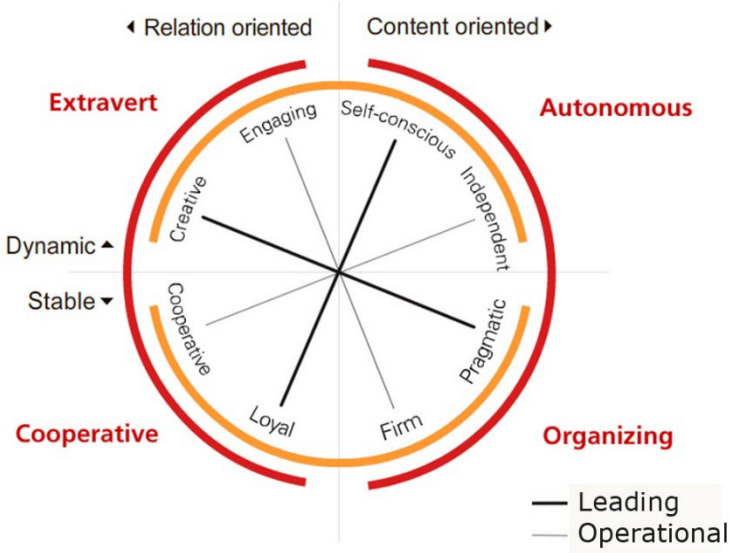
Table 1: Models and methods used in the research phases

Models, methods	*Phase 1: LLL-S-L*	*Phase 2: ICSL*	*Phase 3: LOM4S*
Demand-driven competence model (identification of competencies; personal or organisational)	X	X	X
RDA (behavioural competency model)	X	X	X
CVF (organisational culture and effectiveness model)	–	–	X
Literature exploration (desk research)	X	X	X
Interview	X	X	X
Standardised workshop for data collection and consensus building	X	X	X
Questionnaire survey	X	–	–

Models, methods	*Phase 1: LLL-S-L*	*Phase 2: ICSL*	*Phase 3: LOM4S*
Questionnaire survey on a representative sample	–	–	X
Case study on the use of the development products	X	X	X
Testing the results of the development (prototype) and analysing the results	X	X	X

Role Diagrammatic Approach (RDA): According to its creators, this is an integrated behavioural competence model based on a holistic approach and *a structured description of human behaviour* (*van Harten & Wolbers*, 2005). Using the RDA, behaviour can be described along three dimensions: dynamic and stable, relationship- and content-orientation, and leading and operational functions. Beyond these dimensions, behaviour can be characterised in four quadrants (autonomous, organising, extroverted, and cooperative) defined by the first two. Each of the four quadrants contains two axes, which enable the description of leading and operational characteristics. I led the

adaptation of the model for the Hungarian context. The characteristics of the model are shown in Figure 3.



3. Figure: RDA – dimensions, quadrants, axes

Competing Values Framework (CVF): This model, developed in the profit sector, is suitable for examining *organisational effectiveness and culture*. Of the three dimensions, I will highlight two here: one is organisational orientation, along which organisations can be outward-looking (having external orientation), competitive organisations, or

inward-looking (having internal orientation), focusing on their operations, traditions and people. The other dimension is the degree of organisational structure and hierarchy, along which organisations can be highly structured and hierarchical, or flexible organisations with a flat hierarchy (Figure 4). Four sub-models can be distinguished along these two dimensions: the rational goal model (market), the internal processes model (hierarchy), the human relations model (clan), and the open system model (adhocracy). The model can depict not only organisational functioning but also leadership roles. (See, for example: *Quinn & Rohrbaugh*, 1983; *Quinn et al.*, 1996; *Cameron & Quinn*, 2011). In addition to diagnosis, the CVF is suitable for comparing the present with the desired future, thereby also supporting development. I adapted the CVF for use in an educational setting in the mid-1990s, and I developed tools related to the model during a nationally representative study conducted between 1996 and 1998 (*Baráth*, 1996, 1998).

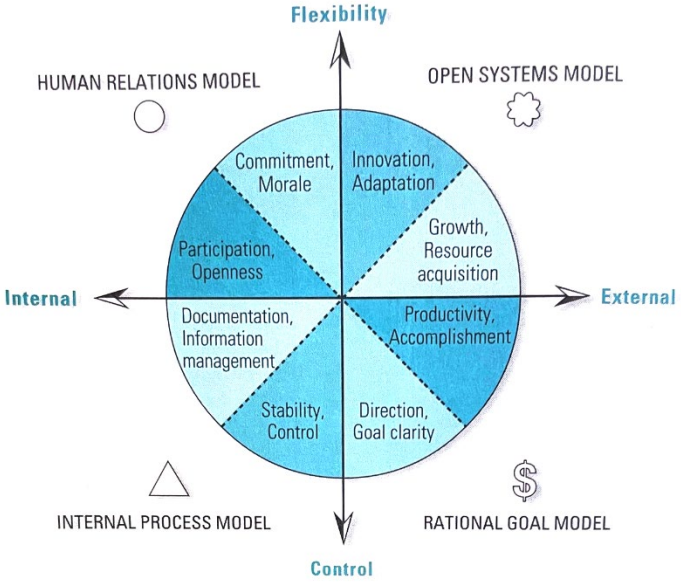


Figure 4: Efficiency criteria in the competing values framework

Source: Quinn et al., 1996, 12

Workshops: For a long time, these were essentially regarded as a development tool or method. However, this status has changed. Workshops are increasingly appearing as a research method, particularly when deep interaction among stakeholders is required or when the expected outcome depends on discussion and mutual agreement among stakeholders to solve complex tasks or problems (*Ørngree*

& Levinsen, 2017; *Dolan & Liebenberg*, 2019; *Lange*, 2019). In applying the demand-driven competence development model, workshops played a decisive role in data collection and in discussions and consensus-building among stakeholders. I developed the standardised format and programme for the workshops during the research phases.

3.3. Design-based research as the methodological framework for the research phases

An important task in defining the methodological framework is to establish the status of the research phases. All three phases were based on the integrated application of the demand-driven competence development model (DDCDM) and a behavioural competence model (RDA). Each phase can be regarded as developmental research (rather than simply development), as evidenced by several factors. Without going into detail, this involves the use of procedures that are not necessary for development but are indispensable in developmental research: the application of evaluation and validation methods and procedures

during the examination of results; prototyping, its systematic examination and further development; the preparation of documentation supporting reproducibility; specialised analyses (e.g., during Phase 1, examining the relationship between the competency framework and school autonomy; in Phase 2, validating Central5; in Phase 3, conducting a wide-ranging, mixed-methods research following model development to support the application of the model); making policy recommendations. These elements not only confirm that the activities carried out in the three projects can be regarded as research-based developments, but also provide the basis for incorporating the research phases – which differed in part in terms of space and time – into a unified methodological framework using *design-based research (DBR)*.

Design-based research (DBR) is a relatively young research methodology. Its novel approach – which aims to achieve practical applicability and to contribute to scientific theories, particularly the feasibility of combining these two aspects – has sparked considerable debate. Although these debates are not yet concluded, it can be said

that DBR has now become a recognised and widely accepted research methodology.

In my thesis (subchapter 3.2), I dealt in detail with the origins, development, and criticism of DBR, and finally with the justification of why the phases of my research can be described using DBR. Here I mention a few key elements. *Ann L. Brown's* (1992) research laid the foundations for the new methodology, whilst also linking it closely to the learning science. Many researchers believed that this approach could bring a new, innovative research perspective on educational research. One of its fundamental characteristics is that it starts from practice and examines a practical problem. At the same time, the research methodology contributes to the development of scientific interpretations and theories (*Collins*, 1992; *Reeves*, 1999; *Design-Based Research Collective*, 2003; *Bannan-Ritland*, 2003; *van den Akker et al.*, 2006). The research phases are best linked to *Plomp's* (2010, p. 9) interpretation and definition, according to whom DBR starts directly from the problem. He defines educational design research as a research approach that seeks answers to complex problems arising

from educational practice for which there is no clear guidance. Educational research design is a methodology that systematically integrates planning, development, and evaluation into an intervention system aimed at solving complex problems. The characteristics expected by Plomp (complexity, starting from a practical problem, systematic planning, development, and evaluation, etc.) are all present in the research phases I have carried out.

4. SCIENTIFIC RESULTS (THESES)

The five theses presented below are the result of a synthesis of the three phases of development research (LLL-S-L, ICSL, LOM4S) carried out during my research. Due to the nature and context of the developmental research (international and domestic cooperation), the phases required teamwork (data collection processes, the organisation of international workshops, the development of Central5, and the learning organisation model). At the same time, the system design, the methodological foundation of the research phases, and numerous parts of the analyses

conducted on the raw data (e.g., the process of defining school leadership competencies, the adaptation of the DDCDM to the developmental research phases, the conception of the empirical studies, and the completion of some of the analyses) are the result of my own academic work.

In the following, I will proceed through the following sections: *Problem statement* → *Objectives* → *Methods* → *Results* → *Significance*, presenting the most important scientific findings of my thesis.

4.1. Thesis 1: The definability of competencies for successful school leadership in the knowledge society

*Problem statement***:** The transition to a knowledge society, along with the intricate, complex, and rapidly changing processes of the socio-economic system (the VUCA world), is radically transforming expectations regarding schools and, consequently, their leadership. This raises the need for a theoretically grounded, practically applicable competency framework for school leaders that can be utilised in the knowledge society. The question, then, is

whether expectations regarding school leadership can be derived from the functioning and characteristics of the knowledge society, and from the expectations this social formation places on schools? If these competencies can, in principle, be defined, how might this definition be achieved?

Objectives: My starting point was the fundamental task of the school: successfully preparing pupils for entry into the knowledge society and for personal success. If we accept this, the question is: what kinds of knowledge and preparedness are required of school leadership to achieve this? Obviously, this cannot be determined directly. To do so, I had to explore the logical chain by which, starting from the students' competencies required in the knowledge society, we can arrive at the definition of the competencies required of school leadership. (See point 2, Figures 1–2.)

Methods: To achieve this aim, I primarily relied on a literature review. In the case of organisational characteristics, this was supplemented by a mixed-methods investigation (LOM4S, the third phase of the research). Defining the competencies of school leadership also necessitated the

use of a mixed-methods approach. Specifically, I adapted the demand-driven competence development model to the research phases, resulting in the creation of the Central5 leadership competency framework during the first and second phases of the research.

Results: The key findings of this thesis were the logical framework of the research and the mechanism through which school leadership influences pupils' development, as illustrated in Figures 1 and 2.

Significance: By following through on the research concept, I have demonstrated that, starting from the school's fundamental function—the development and preparation of pupils—it is possible to define the competencies required of school leadership to create a suitable learning environment for pupils. This was complemented by the mechanism of action, the significance of which lies not only in demonstrating the impact of leadership step by step, but also in making these impacts analysable, thereby enabling interventions aimed at development.

In the case of Central5, the adaptability of the DDCDM enabled its application to the development of a school

leadership competency framework. The methodology I adapted and applied during the development of Central5 demonstrably yielded results. This shows that the DDCDM itself is applicable in a transnational context. The significance of the used methodology is reinforced by its transferability to other areas. A concrete example of this is the third phase of my research, during which we applied the model to define organisational competencies. I developed the procedure in this case as well.

4.2. Thesis 2: Demonstrating the organic link between the functioning of a learning organisation and Central5 leadership competencies

Problem statement: In Thesis 1, I demonstrated two things: a) In line with the research concept (Figure 1), the school leadership competencies required in the knowledge society can be defined. b) Using the DDCDM, Central5 as a detailed competency framework was developed. The question is whether school leadership possessing the competencies described in Central5 can establish and operate a learning organisation.

Objective: My aim was to demonstrate that the content of Central5, as a competency framework, aligns with the school leadership competencies required to establish and operate a student organisation.

Method: Comparative content analysis, categorisation.

Results: In order to achieve this aim, I conducted a content analysis based on the leadership competency framework, Central5, produced as a result of the first two research phases (LLL-S-L and ICSL), and the characteristics of the learning organisation domains identified in the LOM4S project. I formulated the question of whether the content elements belonging to the Central5 domains (the individual components of leadership competencies) can be classified within the learning organisation domains. This is because the characteristics of a learning organisation implicitly define expectations regarding leadership; in other words, we can infer the characteristics of its leadership from the way the organisation operates with those specific characteristics, and so this classification can be made. As a result, if this classification can be applied to the majority of the competencies found in Central5, this confirms that

the competency elements identified in Central5 are also relevant to the leadership of learning organisations. If this is the case, then the data collected by LLL-S-L and ICSL, the questionnaire survey, and the leadership profiles developed on the basis of the workshops can be appropriately used to describe the competencies required for the leadership of learning organisations. I carried out the study and, based on the content analysis, found that 95.6% of the competency elements (knowledge, skills, attitudes) listed in Central5 could be assigned to one of the areas of learning organisation operation, and no area of Central5 was omitted from the classification. On this basis, I demonstrated that the school leadership competencies defined in Central5 are also relevant to the establishment and operation of a learning organisation.

Significance: The above finding was necessary to provide a positive answer to the main research question. It enabled me to demonstrate that the Central5 competency framework is suitable for describing the school leadership competencies required to establish and operate a school functioning as a learning organisation. With this step, I

demonstrated that it is possible to follow the logical path shown in Figure 1, which presents the research concept. It is not merely an assumption that the competencies for successful school leadership in the knowledge society can be defined along this path; rather, there is a concrete, practical example of this.

4.3. Thesis 3: Validation of Central5

Problem statement: The second phase of my research led to the development of Central5. The application of the demand-driven competence development model (DDCDM) – which I proposed as the methodology for the developmental research and adapted for the research phase – resulted in a description of expectations for school leadership (behaviour, mindset, activities, knowledge) in the form of a list of 251 statements. These were structured into five areas by the international research and development team. Subsequently, the competence descriptors (knowledge, skills and abilities, attitudes) were defined based on the statements assigned to each area. Once this was complete, the logical question arose: how does the resulting

competency framework relate to the expectations formulated by the stakeholders (school heads, local and national education administrators, teachers) and set out in the international list of sentences? Can it be said that the two sets of expectations are essentially the same?

Objective: The objective was to determine whether the two sets of expectations can be considered essentially the same.

Method: Comparative analysis using the behavioural competence model (RDA).

Results: To validate Central5, I proposed to the research and development team that we use the RDA to compare the two sets of results. The RDA is a model for analysing and describing behavioural competencies. Those elements of the international statement list which – directly or indirectly – defined behaviour, actions or ways of thinking could be recorded in the RDA. The same could be done with the elements of Central5 that describe the skills, abilities, and attitudes expected of school leaders. (Knowledge itself could not be recorded in the system, though it could be inferred from behaviour and performance.) Thus, the

two sets of results could be compared. Based on the data recorded in the RDA, the profiles were compiled by a colleague of mine (Tamás Kígyós), whilst I carried out the analysis. Through the analysis, I confirmed that the match between the original expectations (international list of statements) and the Central5 developed on this basis (competency expectations based on the descriptors) was 93.79%, which can clearly be considered high. This percentage ranged from 86.98% to 97.47% across the individual areas of Central5, further reinforcing the conclusion that the developed competency framework adequately reflects the expectations originally formulated by the stakeholder groups.

Significance: The primary significance of the result was the validation of Central5 itself. At the same time, this result shows that, by applying the DDCDM, expectations can be identified, and, using a sufficiently sophisticated procedure, the results can be transformed into a system (a description of competencies along descriptors) that can be applied in a targeted manner in practice. The validation, therefore, also confirmed the methodology used.

4.4. Thesis 4: The relationship between the learning organisation and the learning environment

Research question: Based on the logical framework of the research, a key question is whether we can find empirical evidence that a school operating as a learning organisation effectively develops the competencies of its students, which are necessary for them to thrive in the knowledge society.

Objective: To investigate whether, based on data collected in the third research phase (LOM4S), a relationship between the operation as a learning organisation and the learning environment can be substantiated. We can assume that a better learning environment enables students to acquire higher-level competencies.

Method: Questionnaire-based data collection, statistical analysis.

Results: In the third phase of the research, the research team I led developed a new learning organisation model for schools. To validate the model, we developed a questionnaire that enabled us to assess the validity of the

developed (synchronic-diachronic) model. Using factor analysis of the responses, we successfully identified two groups of factors as new variables: one group characterised teachers' workplace learning, whilst the other described students' learning environment. The third composite variable (the dependent variable in the study) characterised the functioning of the learning organisation (LO%).

To explore the relationships among the three composite variables, we conducted an analysis using a general linear model. The question was to what extent the included categorical variables (wle_bin2, sle_bin2) explain the variance in the dependent variable (LO%). We used categorical variables in the OLS because these better demonstrate that there is no interaction between them. As a continuation of the analysis, we examined the effects of the aforementioned variables. The analysis includes sle_bin2 and wle_bin2, which divide the sample into two categories: low SLE/WLE and high SLE/WLE (cut-off at 50%); these categories can be visualised in a 2×2 matrix. We can see, for example, that for wle_bin2, the ß value (fixed effects parameter estimates) is 0.716, which can be interpreted to

mean that if someone is in the high WLE category, they achieve a higher LO% by this factor. If we wish to express this as an equation, then: LO% = wle_bin2×0.716 (the value of wle_bin2 is 1 if the individual belongs to the higher group, and 0 if they belong to the lower group). Similarly, for the sle_bin2 variable, we can see that the ß value is 1.065. The effect on LO% can also be described here using a similar equation: LO% = sle_bin2×1.065. The equations show how the LO% value is influenced by low or high levels of the workplace learning and student learning environment variables. We can also see that the latter has a greater effect on LO%. Finally, it is important to note that there is no interaction between the two categorical variables (wle_bin2 and sle_bin2). Thus, we have so far succeeded in confirming the relationship between the variables. Similarly, the relationship could be examined in the opposite direction, i.e. whether the functioning of the learning organisation is correlated with the learning environments of teachers and students. The method was therefore suitable for confirming the relationship, not for investigating a cause-and-effect relationship.

At the same time, these factors (describing the learning environment) affect the functioning of the learning organisation. This leads to two conclusions, which, although not substantiated by the data in the thesis, allow us to make a strong assumption: a) The organisational characteristics are sufficiently deep-rooted and strong to suggest that they are fundamentally capable of determining the learning environment. In other words, the learning environment (that of both the student and the teacher) is, if you like, a reflection or an indicator (like litmus paper) of how the learning organisation functions. b) Naturally, the processes taking place within the organisation are not of a start-stop nature; they do not simply begin, run their course, and then stop, but rather have a feedback effect on the organisation's functioning. That is to say, it is possible that at certain points – whether on the initiative of individuals or small groups and as a result of their activities (these may be student or teacher initiatives, or a combination of both) – student and/or teacher learning exhibits characteristics that go beyond the organisation's general learning characteristics. These new forms of learning inspire organisational learning, which may develop into a more advanced form and

practice than before, thereby enabling the organisation to make progress in the area of learning organisation characteristics. This approach thus refers to the circular relationship between the variables in question. This relationship diverges due to the uneven changes across these areas, forming a spiral.

Based on the specific empirical study and knowledge of the organisations' internal processes, we can confirm that the functioning of a learning organisation can influence students' learning environment—and thus the quality of their learning—both directly and indirectly through teachers' learning.

Significance: Following the logical framework of the research, I demonstrated that learning organisations can be expected to create a suitable learning environment.

4.5. Thesis 5: Linking school leadership competency expectations and school autonomy

Problem statement: A key question regarding the development of a school leadership competency framework was

whether the differences across the education systems of the participating countries and variations found in the day-to-day practice of school leadership would allow for the definition of transnational competency standards for leaders. The question can also be posed as to whether the national character of the education system and the differences arising from historical context have a greater impact on leadership expectations, or whether the fact that a school is fundamentally an organisation – one which naturally has specific criteria – means that everything we know about modern organisations and their leadership also applies to it. Furthermore, the globalising, postmodern world – even if its characteristics are present in our societies and schools in different ways and to varying degrees – largely determines the key competencies that school leaders must possess in the 21st century.

Objective: In line with the focus of developmental research, we set out to examine the relationship between school autonomy and the competencies of school leaders.

Method: Questionnaire survey among school leaders and education policymakers, statistical analysis.

Results: To achieve this objective, I compared the perceived and desired levels of autonomy with statements describing leadership behaviour associated with autonomy. We examined autonomy in general terms and across four key areas (employer rights and recruitment; operational regulation; financial management; curriculum, programme). In the case of desirable autonomy, we asked whether its level should be reduced or increased, or whether it was already at the desirable level. This enabled us to examine which leadership approaches prevail at different levels of desired autonomy.

The areas of perceived autonomy behaved as a unidimensional scale based on the principal component analysis, and can therefore be regarded as a single variable representing the degree of autonomy. When examining the variation in this variable across countries, the five countries could be classified into three groups. Austria perceived the lowest level of autonomy, Hungary and Slovenia fell into the middle group, whilst the Czech Republic and Slovakia perceived a high level.

Using regression analysis, I examined which of the 32 statements used to develop the functional profiles describing leadership functioning and behaviour had an impact on perceived autonomy. This revealed that those factors and characteristics which require an extension of leaders' freedom of action may negatively influence the degree of perceived autonomy. This may be explained by the fact that a perceived lack of the autonomy necessary for the leader limits their ability to act and to realise their ambitions. Characteristics that enhance adaptability, helping the leader to achieve their goals within the given constraints, increase satisfaction with autonomy. In this case, the phenomenon can be explained by the fact that the leader can realise their ambitions within the constraints and therefore does not experience them negatively.

Overall, the degree of perceived autonomy is associated with leadership competencies of school leaders. Autonomy – like other important factors in school operations – can be defined by taking into account education policy and, in a broader sense, schooling, knowledge, learning, and the social policies that reflect these. Therefore, when

defining the competencies of school leaders, it is necessary to understand, explore, and incorporate these expectations. This aspect of the study further reinforces the need to develop an adaptive system.

The examination of desirable autonomy led to two factors. With the help of these, numerous analyses could be carried out. Here, I highlight what is closest to our question: what most determines the competencies of school leadership in the knowledge society.

We have seen that the set of competencies considered optimal within a given system – that is, the desirable forms of behaviour, patterns of action and knowledge – may vary according to the characteristics of the education system. It is also worth noting that the knowledge-based society is not a uniform, homogeneous construct. Despite its fundamental characteristics, it exhibits significant spatial, temporal, and historical differences influenced by culture (see, for example, the Finnish and Singaporean education systems), which have a significant impact on the competencies relevant to school leaders. In many respects, a successful leader must possess different competencies when

acting primarily as a pedagogical leader than when bearing full responsibility for the organisation's operations and exercising strong authority in areas such as finance, infrastructure operations and development, recruitment, etc. This further reinforces our view that decision-makers in educational administration can only hope to appoint highly qualified headteachers to lead schools if they clearly define the competencies expected of them. It also follows that decision-makers' visions for the future, for the society of tomorrow, and for the role of the school within it will significantly determine the necessary leadership competencies. It suffices to consider, for example, what lies at the heart of school education: teaching or learning, however closely these two concepts may be intertwined. Based on the results of the first phase of the research, it can be established that the competency expectations placed on a successful school leader in a knowledge-based society can be defined. In several cases, these revealed significant differences in content and priority between the competency elements. This suggests that it is essential to examine the broader context and educational systems, as these clearly influence the definition of the expected competencies.

Although these elements arose during the development research, they were not brought to the fore.

Significance: Overall, we can conclude that a competency framework for school leadership can be established that operates successfully in the knowledge society. The set of competencies considered optimal within a given system – that is, the desirable forms of behaviour, patterns of action and knowledge – may vary according to the characteristics of the education system.

Based on an analysis of the relationship between school autonomy and leadership competencies, it can be stated that: a) In a knowledge society, the structure and main directions of the framework for the competencies of successful school leadership are identical. b) It is important to note that we are referring to a framework that requires adaptation, taking into account social and cultural characteristics as well as current socio-political objectives.

5. THE SCIENTIFIC AND PRACTICAL SIGNIFICANCE OF THE FINDINGS

The most important finding of my thesis is that I have succeeded in demonstrating that the competencies required for the successful leadership of schools in the knowledge society can be identified and derived from the competencies students need to thrive in it. Another important finding is that schools operating as learning organisations can create an optimal environment for the development of students' competencies. In this regard, the thesis provides evidence of the relationship between students' and teachers' learning environments and the functioning of learning organisations.

From a methodological perspective, I highlight two contributions. Firstly, the thesis successfully provided a practical example of the development of school leadership competencies. The adapted version of the demand-driven competence development model worked well. The involvement and active participation of stakeholders played

a key role in the results and the proven practical applicability. Applicability was also supported by the interpretation of competency, which captured competency from both process and outcome perspectives. Secondly, DBR proved well-suited to framing the research phases within a methodological framework. The integrated application of DBR and service design may hold promise for future research in educational science.

Finally, among the findings, it is worth noting that the developmental research presented in this thesis may serve as inspiration for further investigation into school leadership and student development. At the organisational level, particular interest may lie in leadership, organisational learning, and the interpretation of teachers' and students' learning, as well as in the examination of their interrelationships and their impact. Furthermore, the exploration and development of tools and methods that can enhance the effectiveness and efficiency of school leadership in the VUCA environment in which we live. At the systemic level, further investigation may be required regarding the relationships among education policy, social policy, and

the school system. What influences expectations regarding school leadership, and how does social and sectoral policy support these expectations, and by what means? Finally, due to the nature and pace of social change, as well as advances in science and technology (e.g., AI), the socially beneficial application of new knowledge may become paramount. Schools could play a fundamental role in this – if they are able to fulfil this role – which requires leadership that is professionally prepared and possesses a strong moral compass. Exploring, understanding, and developing this area could be a factor in shaping the future.

6. AUTHORS' PUBLICATIONS IN THE FIELD

Baráth, T. (1997a): The successful school. In: Baráth, T. & Golnhofer, E. (eds.): *Public Education Manager II. Education – Upbringing – Development*. OKKER, Budapest, 5–59.

Baráth, T. (1997b): Effective School. In: Baráth, T. & Golnhofer, E. (eds.): *School Management and Development I.* JATE, Szeged, B1–B85.

Baráth, T. (1997c): School Philosophy and Pedagogical Programme. In: Baráth, T. & Golnhofer, E. (eds.): *School Management and Development I*. JATE, Szeged, M1–M83.

Baráth, T. (1998): Models of Effectiveness in Public Education: In: Budai, Á. & Varga, L. (eds.) *Public Education Research 1996–1997*. Ministry of Culture, Budapest, 44–85.

Baráth, T. (2000): Effectiveness in public education: Models and aspects of leadership. In: Balázs, É. & Wieringen, F. (eds): *Quality in educational management*. Műszaki Könyvkiadó, member of Wolters Kluwer Group, Budapest, 147–168.

Baráth, T. (2006): Characteristics of school leadership and the effectiveness and efficiency of the institution. In: *Új Pedagógiai Szemle. No. 7–8*, 56–72.

Baráth, T. (2010a): Methodology applied in the project. In: Abari-Ibolya & Baráth (eds.): *Improving school leadership in Central Europe.* Tempus Public Foundation, Budapest, 33–40.

Baráth, T. (2010b): Workshops – concepts and results. In: Abari-Ibolya & Baráth (eds.): *Improving school leadership in Central Europe*. Tempus Public Foundation, Budapest, 41–55.

Baráth, T. (2010c): Defining and analysing leader competence profiles. In: Abari-Ibolya, Baráth (eds.): *Improving school leadership in Central Europe*. Tempus Public Foundation, Budapest, 67–95.

Baráth, T. (2010d): Competence expectations and school autonomy. In: Abari-Ibolya & Baráth (eds.): *Improving school leadership in Central Europe*. Tempus Public Foundation, Budapest, 96–110.

Baráth, T. & Schratz, M. (2010): Conclusions and recommendations for policy makers: *Improving school leadership in Central Europe.* Tempus Public Foundation, Budapest, 111–115.

Baráth, T. & Cseh, Gy. (2011): PDA – the optimal way of organisational development. The role and responsibility of school leadership. In: Baráth, T. & Szabó, M. (eds): *Does leadership matter?* SZTE KÖVI, NTK., Szeged, 169–203.

Baráth, T. (2013a): Methodology of the competency framework development. In: Kirkham & Révai (eds.): *The art and science of leading a school – Central5: Central-European view on competencies for school leaders*. Tempus Public Foundation, Budapest, 31–42.

Baráth, T. (2013b): The Role Diagrammatic Approach. In: Kirkham & Révai (eds.): *The art and science of leading a school – Central5: Central-European view on competencies for school leaders*. Tempus Public Foundation, Budapest, 219–225.

Baráth, T. & Kirkham, G.A. (2013): Coherence and validity 5.1 and 5.2. In: Kirkham & Révai (eds.): *The art and science of leading a school – Central5: Central-European view on competencies for school leaders*. Tempus Public Foundation, Budapest, 66–77.

Baráth, T. (2014): The school as a learning organisation. In: Benedek, A. & Golnhofer, E. (eds.): *Studies in the field of educational sciences, 2013.* MTA Committee on Pedagogical Sciences, Budapest, 235–255.

Baráth, T. (2015). Learning organisation as a tool for better and more effective schools. In: *Procedia Manufacturing. Volume 3*. Elsevier, USA, 1494–1502. https://doi.org/10.1016/j.promfg.2015.07.330

Baráth, T. (2015, ed.). *The Renewed Schools of the Southern Great Plain*. Szeged University Press, Juhász Gyula Higher Education Publishing House, Szeged.

Baráth, T. (2017): Leading learning school. In: *Advances in Intelligent Systems and Computing Series, Volume 498.* Kantola, Baráth, Nazir, Andre (eds., 2016): Advances in Human Factors, Business Management, Training and Education. Springer, Switzerland, 1185–1198. https://doi.org/10.1007/978-3-319-42070-7_107

7. SELECTED REFERENCES

Abari-Ibolya, E. & Baráth, T (eds.): *Improving school leadership in Central Europe.* Tempus Public Foundation, Budapest

Argyris, C. and Schön, D. A. (1978): *Organizational Learning, A Theory of Action Perspective.* Addison-Westley Publishing Co., Boston.

Argyris, C. and Schön, D. A. (1996): *Organizational Learning II. Theory, Method and Practice.* Addison-Westley Publishing Co., Boston.

Bannan-Ritland, B. (2003): The role of design in research: the integrative learning design framework. *Educational Researcher, 32*(1), 21–24.

Barrett, P., Davies, F., Zhang, Y. & Barrett, L. (2015): The impact of classroom design on pupils' learning: Final results of a holistic, multi-level analysis. In: *Building and Environment 89*. Elsevier, 118–133.

Belet, D. (2009): A new learning-oriented leadership paradigm to facilitate the development of a second-generation learning organisation. In: Bruining, T. (2009, ed.): *Learning organisation. The next generation*. European Consortium for the Learning Organisation in cooperation with KPC Group, 's Hertogenbosch - The Netherlands. pp. 119–139. Downloaded on 11 February 2013.

Bennis, W. G. (1966): *Towards a 'Truly' Scientific Management*. Prentice-Hall, Englewood Cliffs, NJ, USA.

Bosker, R.J., & Witziers, B. (April 1996): *The magnitude of school effects. or: Does it really matter which school a student attends?* Paper presented at the Annual Meeting of the American Educational Research Association, New York, USA.

Boyatzis, R.E. (1982): *The Competent Manager: A Model for Effective Performance.* John Wiley & Sons, New York, USA.

Brown, A.L. (1992): Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The Journal of the Learning Sciences*, *2*(2), 141–178.

Cameron, K.S. & Quinn, R.E. (2011): *Diagnosing and Changing Organisational Culture based on the Competing Values Framework*. Jossey-Bass, San Francisco, CA, USA.

Cameron, K.S. & Whetten, D.A. (1983): *Organizational Effectiveness*. Academic Press, Orlando, FL, USA.

Campbell, J.P. (1977): On the Nature of Organisational Effectiveness. In: Goodman, P.S. – Pennings, J.M. (eds., 1977): *New Perspectives on Organisational Effectiveness*. Jossey-Bass, San Francisco, CA, USA, 40.

Chomsky, Noam (1965): *Aspects of the Theory of Syntax*. MIT Press, Cambridge, MA, USA.

Chomsky, Noam (2006): *Language and Mind. Third Edition.* Cambridge University Press, New York, USA.

Coleman, J.S., Campbell, E., Hobson, C., McPartland, J., Mood, A. & York, R. (1966): *Equality of Educational Opportunity*. US Government Printing Office, Washington, D.C., USA.

Coleman, J.S., Hoffer, T. & Kilgore, S. (1981): *Public and Private Schools*. National Opinion Research Center, University of Chicago, Chicago, IL, USA.

Collins, A. (1992): Toward a Design Science of Education. In: Scanlon, E., O'Shea, T. (eds.) *New Directions in Educational Technology. NATO ASI Series, vol 96.* Springer, Berlin, Heidelberg, 15–22. https://doi.org/10.1007/978-3-642-77750-9_2

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B. & Osher, D. (2020): Implications for educational practice of the science of learning and development, Applied Developmental Science, 24:2, 97–140, https://doi.org/10.1080/10888691.2018.1537791

Day, C., Pam Sammons, P., Hopkins, D., Harris, A., Leithwood, K., Gu, Q., Brown, E., Ahtaridou, E. & Kington, A. (2009): *The Impact of School Leadership on Pupil Outcomes*. Final Report, University of Nottingham, Nottingham, England.

Design-Based Research Collective (2003): Design-based research: an emerging paradigm for educational inquiry. In: *Educational Researcher, 32*(1), 5–8. https://doi.org/10.3102/0013189X032001005

Dolan, K. & Liebenberg, L. (2019): Using Photo-Elicitation Interviewing To Bridge Social Gaps. In: Hoveid, M. H., Ciolan, L., Paseka, A. & da Silva, S.M., (eds): *Doing Educational Research, Overcoming Challenges In Practice.* Sage, London, England, 96–122.

Fadel, C., & Trilling, B. (2009): *21st century skills: Learning for life in our times*. Jossey-Bass, San Francisco, CA, USA.

Faerman, S. R. & Quinn, R. E. (1985): Effectiveness: The Perspective from Organizational Theory. In: *Review of Higher Education*, *No. 9,* 83–100. https://dx.doi.org/10.1353/rhe.1985.0006

Georgopoluos, B.S. & Tannenbaum, A.S. (1957): A Study of Organizational Effectiveness. In: *American Sociological Review*, *Vol. 22,* 534–540. https://doi.org/10.2307/2089477

Jencks, C., Smith, M.S., Ackland, H., Bane, M.J., Cohen, D., Grintlis, H., Heynes, B. & Michelson, S. (1972): *Inequality*. Basic Books, New York, USA.

Jirasinghe D, & Lyons, G. (1996): *The Competent Head: A Job Analysis of Heads' Tasks and Personality Factors.* The Falmer Press, London.

Katz, D. & Kahn, R. (1978): *Social Psychology of Organizations*. Wiley, New York, USA.

Kirkham & Révai (eds.): *The art and science of leading a school – Central5: Central-European view on competencies for school leaders*. Tempus Public Foundation, Budapest

Kools, M. & Stoll, L. (2016): *What Makes a School a Learning Organisation?*, OECD Education Working Papers, No. 137, OECD Publishing, Paris. http://dx.doi.org/10.1787/5jlwm62b3bvh-en

Lange, S.D. (2019): Discussing Sociological Gaps and Power Relations in an International Setting. In: Hoveid, M.H., Ciolan, L., Paseka, A. & da Silva, S.M. (eds.): *Doing Educational Research, Overcoming Challenges in Practice.* Sage, London. 272–307.

Lawrence P.R. & Lorsch, J.W. (1967): *Organisation and Environment*. Harvard Business School, Division of Research, Boston, MA, USA.

Leitch, A. P. (2006): *Leitch Review of Skills. Prosperity for all in the global economy – world class skills*. The Stationery Office, London, England.

Leithwood, K. & Jantzi, D. (1999): Transformational school leadership effects: a replication. In: *School Effectiveness and School Improvement 10*, 451–479. https://doi.org/10.1076/sesi.10.4.451.3495

Leithwood, K., Seashore Louis, K., Anderson, S. & Wahlstrom, K. (2004): *How Leadership Influences Student Learning*. Centre for Applied Research and Educational Improvement, Ontario Institute for Studies in Education, The Wallace Foundation.

Leitner, D. (1994): Do principals affect student outcomes? An organisational perspective. In: *School Effectiveness and School Improvement 5,* 219–238. https://doi.org/10.1080/0924345940050302

LLUK (2006): *A sector skills agreement for the lifelong learning sector. Stage 1: Skills Needs Assessment (SNA)*. Lifelong Learning UK (LLUK), London.

Louis, K.S., Leithwood, K., L. Wahlstrom, K.L. & Anderson, S.E. (2010): *Investigating the Links to Improved Student Learning*. Final report of research findings, University of Minnesota, Minneapolis, US.

Mansilla, V.B. & Schleicher, A. (2022): *Big Picture Thinking: How to educate the whole person for an interconnected world*. OECD, Paris. https://pz.harvard.edu/sites/default/files/WEB_Big%20Picture%20Thinking_how%20to%20educate%20the%20whole%20person%20for%20an%20interconnected%20world%5B99%5D.pdf Downloaded: 05.12.2024.

McClelland, D.C. (1973): Testing for Competence Rather than for "Intelligence". in: *American Psychologist, 28,* 1-14. https://doi.org/10.1037/h0034092

Mortimore, P., Sammons, P., Stoll, L., Lewis, D. & Ecob, R. (1988): *School Matters: The Junior Years*. Open Books, Wells.

Mulford, B. & Silins, H. (2003): Leadership for Organisational Learning and Improved Student Outcomes—What Do We Know? In: *Cambridge Journal of Education*, Vol. 33, No. 2, pp. 175–195.

National Association of Elementary School Principals (2008): *Leading Learning Communities: Standards for What Principals Should Know and Be Able To Do.* 2nd edition Alexandria, VA: NAESP

OECD (2019): *OECD Future of Education and Skills 2030: OECD Learning Compass 2030*. OECD Publishing, Paris.

OECD (2019): *OECD Future of Education and Skills 2030: OECD Learning Compass 2030*. OECD Publishing, Paris.

Ontario Institute for Education Leadership (2008): *The Ontario Leadership Framework*. Ontario's Institute for Education Leadership, Canada. (Revised in 2013)

Ørngreen, R. & Levinsen, K. (2017): Workshops as a Research Methodology. in: *The Electronic Journal of eLearning, Vol. 15,* Issue 1, 70–81. Downloaded: 16 May 2023. Available online at www.ejel.org.

Parry, S.B. (1996): The quest for competencies. *Training, 33*(7), 48–54.

Plomp, T. (2010). Educational Design Research: an Introduction. in: Plomp, T. & Nieveen, N. (eds.): *An Introduction to Educational Design Research*. SLO – Netherlands institute for curriculum development. Proceedings of the seminar held at East China Normal University, Shanghai (PR China). 23–26 November 2007. 9–36.

Pol, M., Hlousková, L., Lazarová, B., Novotny, P. & Sedlácek, M. (2011): On the defining characteristics of organisational learning in schools. In: Baráth, T. & Szabó, M. (eds.): *Does Leadership Matter? Implications for Leadership Development and the School as a Learning Organisation*. SZTE KÖVI and Nemzeti Tankönyvkiadó, Budapest-Szeged, 147–157.

Pol, M., Hloušková, L., Lazarová, B., Novotný, P. & Sedláček, M. (2013): An exploration of organisational learning in Czech schools. In: Aksu, Mualla, Sabanci, Ali and Aksu, Türkan (eds.): *Educational leaders as change agents*. Akdeniz University, Faculty of Education, Ankara, pp. 187–197.

Quinn, R.E. & Rohrbaugh, J. (1983): A Spatial Model of Effectiveness Criteria: towards a Competing Values Approach to Organizational Analysis. In: *Management Science, Vol. 29,* No. 3, 363–377.

Quinn, R.E., Faerman S.R., Thompson, M.P. & McGrath, M.R. (1996): *Becoming a Master Manager. A competency Framework. Second Edition.* John Wiley & Sons, Inc., New York, USA.

Redecker, C. (2017): *European Framework for the Digital Competence of Educators*. Luxembourg: Publications Office of the European Union

Sawyer, K. (2008): Optimising Learning: Implications of Learning Sciences Research by R. Keith Sawyer, In: *OECD: Innovating to learn, learning to innovate*. OECD Publishing, Paris, 45–65.

Schereens, J. (1992): *Effective Schooling*. Cassell, London.

Senge, P.M. (1990/2006): *The Fifth Discipline. The Art & Practice of the Learning Organisation*. Doubleday, USA.

Senge, P.M. (1994/1998): *The Fifth Discipline.* The Theory and Practice of Building a Learning Organisation. HVG Kiadó, Budapest.

Spencer, L.M., & Spencer, S.M. (1993): *Competence at work: Models for superior performance*. John Wiley & Sons, Inc., New York, USA.

Taylor, F.W. (1947): *The Principles of Scientific Management*. Harper and Row, New York.

UNESCO (2006): *New roles of secondary school headteachers*. UNESCO, France. (English version published in 2009)

van den Akker, J., Gravemeijer, K, McKenney, S. & Nieveen, N. (eds). (2006). *Educational design research*. London, Routledge.

van Harten, H. & Wolbers, H. (2005). *Syllabus; RDA basics certification course.* Con7, Utrecht.

Visser, M. (2007): Deutero-learning in organisations: a review and a reformulation. In: *Academy of Management Review*. Vol. 32, No. 2, 659–667.

Vuorikari, R., Kluzer, S. & Punie, Y. (2022): *DigComp 2.2 The Digital Competence Framework for Citizens*. Luxembourg: Publications Office of the European Union. doi:10.2760/115376

Vuorikari, R., Punie, Y., Carretero, S. & Van den Brande, L. (2016): *DigComp 2.0: The Digital Competence Framework for Citizens*. Joint Research Centre, European Union, doi:10.2791/11517

Wilson, A., Lenssen, G. & Hind, P. (2006): *Leadership Qualities and Management Competencies for Corporate Responsibility.* A Research Report for the European Academy of Business in Society Ashridge