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The Adaptability of
Education Systems to
Future Challenges in Context:
An Analytical Framework

ABOUT THE PROJECT

The “**Future Challenges to Education Systems in Central Eastern European Context**” (EDUC, <https://cps.ceu.edu/research/educ>) is a two year comparative research project aiming at assessing the ability of the education systems of five Central-Eastern European countries to adapt to various ongoing changes, such as technological changes and their impact on labor markets, demographic changes, populist politics and autocratic governance, old and new inequalities, changing gender roles, globalization, etc. The research focuses on the adaptability of education systems determined by the interplay between governance and the institutional operation of schools in Poland, Hungary, Slovakia, Serbia and Romania.

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Introduction: the rationale

Those who enter schooling now at the age of six or seven will leave formal education in twelve, seventeen or twenty years' time. Therefore, education should serve the purpose of the future as determined by this timeframe. Traditional views about the purpose of schooling that serve to fulfill certain *intrinsic aims* of education, - such as the development of the personality of children (e.g. self-reliance, autonomy, identity, etc.) or cultural reproduction, - are often considered only on the basis of learning needs determined by the age of pupils. In contrast, serving *instrumental educational aims* that are extracted in relation to the needs of wider society requires a great deal of future-oriented thinking (Winch and Gingell, 1999, Radó, 2010). Indeed, determining the role of education in strengthening social cohesion, or ensuring the employability of the labor force, has always involved shooting at moving targets, while the goal of personal and cultural development has appeared to have been attached to rather stable psychological and cultural references. In this respect however, the situation has now become essentially different and unprecedented: we can no longer even see the targets, and under the pressure of rapid societal change even the aims related to intrinsic socialization must be reconsidered.

Education has always been regarded as an instrument for solving economic, social, cultural or political problems. The growing complexity of modern societies – and the introduction of mass education – has increased the number of issues for which we call on education to deliver long-term solutions. In spite of serious doubts about the omnipotent power of education, all the major challenges we face are becoming “educationalized” (Depaepe-Smeyers, 2008). Probably, this pressure on education has never been as strong as in the present time, when we are faced with so many challenges. Certain changes are ongoing in the societal, demographic, political, economic, and technological environment of schools that are imposing serious adaptation-related challenges on all schools and education systems and which will determine the alignment of strategies for educational change in the forthcoming years. Due to the fast acceleration of the speed of change, the reference points for strategic thinking are often fading into obscurity. In addition to this, the challenge that education systems need to face is not simply the impact of individual, isolated changes; it is the fundamental overall change created by the combined effects of all the technological, economic, societal and political shifts that are forthcoming in the very near future.

Of course, there is much research and talk about the various changes, such as the impact of the use of new technologies, migration on the structure of labor markets, the challenges imposed by the ongoing populist tide, and climate change. If our ambition is to inform educational strategic discourse, we need to undertake specific further steps: namely, revealing the impact of all these changes on education systems, and interpreting them in terms of our expectations towards schools. Also, research that serves to inform strategic thinking in education requires a certain level of contextualization. Major global changes do not have the same effect on education with the same intensity everywhere. The labor-market effects of robotization on the supply of jobs, or the actual effects of climate change, might be very different in Canada, in Finland, and in Romania.

All the various elements of the pressure for adjustment briefly outlined in the following pages add up to an overall crisis of the prevailing educational paradigm. Failure to adapt is already resulting in the declining relevance of schooling that may lead to the emergence of a de-schooling scenario; not one that is based on the radical transformation of schools, but one based on the possible exodus or exclusion of great masses from formal education. In order to pave the way for informed strategic thinking, we need to understand how schools as organizations (or “quasi organizations”) adapt. Institutional adaptation to external challenges in education occurs within the dynamics that operate between the functioning of schools and their institutional environments that are created by the functional sub-systems of governance. This aspect of the analysis also calls for a great deal of contextualization. Schools as social constructs are largely embedded into their societal and cultural environment. Analysis of the performance profiles of European education systems renders the

hypothesis probable that in larger European regions there are some common cultural characteristics and traditions that partially determine the capacity of schools to deliver high quality learning outcomes. Therefore, despite relatively significant declines or improvements in learning outcomes in individual education systems over time, the overall level of performance of Scandinavian, Central-European, and South-East European countries remains surprisingly similar. In contrast, the structural characteristics of educational governance systems, as well as the actual toolkits they apply, show great diversity, even within distinct larger European regions.

What this paper attempts to achieve is the establishment of a conceptual basis and an analytical framework for comparative research by formulating five basic questions:

1. How can the major changes that are already ongoing in the wider environment of schools and school systems be interpreted as challenges to which education systems need to respond?
2. How can all these challenges be contextualized in order to assess their actual weight in Central-Eastern European countries?
3. What are the already identified and ongoing mainstream strategies for adaptation, and to what extent are they being applied in Central-Eastern European countries?
4. What are the basic preconditions for school-level adaptation in general, and especially in the countries of the region?
5. How might governance systems enforce, incite, and support institutional-level adaptation, and how well are Central-Eastern European governments capable of making use of these necessary instruments?

1. Disruptive changes in education

There are eight interlocking ongoing changes that will have a potentially great impact on the way that education is designed and serves its fundamental purposes. A preliminary list of relevant changes to be considered is the following: (1) technological changes, (2) the transformation of the structure of job supply and the workplace, (3) demographic changes and various forms of migration, (4) the tide of populist politics and the increasing number of new types of autocratic regimes, (5) the tenacious survival of old societal forms of inequality and the emergence of new ones, (6) changing gender roles, (7) climate change, and (8) globalization. Recent and future technological developments are widely referred to as “disruptive changes” (Schwab, 2016). However, from the perspective of education, all the other above-listed processes of change are disruptive in the sense that each one of them – and especially their combination – compels a reconsideration of how the core functions of schools are implemented: school programs, the organizations of teaching and learning, and instruction and assessment. Inevitably, when reconsidering core school functions this implies the reconsideration of secondary school functions, too, such as organizational processes, the internal allocation of resources, human resource management, the supply of teaching materials, as well as the management of facilities. Before considering the aggregated effects of all these changes on schools, it is necessary to look at their potential effects one by one.

1.1 Technological changes

Education systems are still struggling to adapt to changes brought about by the “New Economy” that occurred during the two decades before and after the turn of the century. These are the economic and technological changes that largely influence our present: the widespread use of digital technologies, the internet, industrial automatization, as well as the new wave of globalization that is partly driven by the previous changes. In spite of the fact that the job of educational adaptation to these prior changes is very far from finished, we are already being forced to face the effects of a new

wave of disruptive technological changes such as 3D printing, advanced robotics, new materials, the internet of things and artificial intelligence, on-demand economic platforms, and advances in genetics. All these new developments, widely referred to as the Fourth Industrial Revolution (Schwab, 2016), are rewriting most of the external references for learning. As a consequence, they call for the setting of new goals for schooling and for inventing a type of schooling that is capable of serving these goals.

Unattended challenges lead to declining relevance. We are already witnessing the weakening legitimacy of traditional schooling due to the widening gap between the traditional offline character of learning in schools on the one hand, and the ever more significant online presence of pupils and their parents on the other. To a certain, rather limited extent, this is explained by the still large proportion of “digital immigrants” in the teaching corps, but it involves more than this. In spite of the increasingly intensive use of digital technologies in administration and teaching, the still offline culture of schools is keeping digital devices at arm’s length from pupils and their learning. This indicates cultural path dependency that is caused by the inertia of the traditional “industrial” functioning of schools, to which younger “digital native” teachers are socialized after graduation through initial teacher training. As former experience proves, greater “capacity building” investment into the development of digital competencies within traditional teaching and institutional frameworks will not bring about effective adaptation. Instead, the approach should involve emphasizing the digital preparedness of entire schools.

1.2 The transformation of labor markets

While traditional industrial economies transformed natural resources into products, the New Economy transforms information and knowledge into services. Therefore, human knowledge capable of producing added value has become the most important economic factor in the most developed countries. In this regard we are also witnessing a mismatch between the outputs of education and the needs of the economy that is caused by the relatively slow adaptation of education systems. This, in turn, is resulting in slowing economic growth in many developed countries. Again, and before having enough time to adjust to changes of the recent past, we need to consider the future impact of the Fourth Industrial Revolution on the structural composition of labor markets. While automatization during the period of the New Economy has endangered relatively low-skilled industrial jobs, the above-mentioned technological changes (e.g. robotization) will eliminate whole new categories of jobs that require higher educational attainments. Of course, as in the cases of all previous industrial revolutions, future changes will also create brand new types of jobs that we cannot presently even imagine. The nature of the problem is again slow adaptation that is aggravated by an accumulation of unsolved problems from the previous wave of economic transformation.

In connection to labor market relevance, the first major adaptation challenge is caused by the unprecedented speed of change which is leading the traditional front-loaded approach to adaptation by education into a state of crisis. Since the speed of technological and labor market change is already faster than that of generational change, a readiness for occupational mobility throughout the entire life course has become a basic expectation towards individuals. In other words, while overcoming the mismatch between education and the labor market has always involved shooting at a moving target, lately the targets have started moving even faster, and becoming less and less visible. This has repercussions for the very function of primary and secondary education, especially upper-secondary vocational training. The declining relevance of secondary vocational training is partly caused by the fact that it is trying to do too much at the same time: namely, further develop general skills, provide training for narrowly defined vocations, and help poorly performing students with less privileged backgrounds “catch up.” In general terms, the declining relevance of schooling that is already being sensed has already triggered an intensive reconsideration of desired educational goals and learning pathways. In turn, this has generated intensive discourse about how schools can

better serve a rather radically different set of educational outcomes (OECD, 2015; World Economic Forum, 2016; Radó, 2017; Trilling-Fadel, 2009).

1.3 Demographic changes, migration

The significant effect of demographic changes on education is perceived as a triviality. The balance between school capacities and pupil numbers may be easily maintained if the speed of demographic decline or growth is not too fast. However, significant demographic shrinkage or increases that occur over a longer period of time may cause serious adjustment issues and may alter the behavior of the actors of education. For example, a persistent decline in pupil numbers endangers teachers' jobs and increases the probability of school closures and amalgamations. This often generates defensive school policies for the sake of ensuring stability and survival. In turn, these policies – and the underlying vested interests – have far-reaching consequences for the capacity of schools to adapt, as well as on enrollment policies and all other aspects of schooling. One of the often signaled features of globalization and climate change that will have potentially major demographic effects in many European countries is intensified migration. On the one hand, immigration forces schools to prepare for the individual adaptation of immigrants and to secure the cohesion of society through the integration of the former. This adds to already existing pressure on schools to improve their preparedness for integration and inclusion. On the other hand, emigration from less developed countries generates – sometimes illusory – pressure on education systems to seal up rifts in the labor market caused by labor drain. In addition, demographic changes and migration are highly politicized matters, heavily polluting the related policy discourse with educational considerations that are not genuine.

1.4 Populism, autocratic regimes

In a broader sense, strengthening populism is a metaphor that indicates the recently changing nature of politics. In a more narrow sense, it involves the exploitation of political power obtained through turning “the will of people” against traditionally influential political, professional, economic, and cultural elites. In this sense, there is a direct relationship between populist politics and – in the case of electoral success – autocratic governance. “Autocracy 2.0” operates with a very small amount of soft oppression and with a large amount of communication-related background noise through which facts are replaced by the pretense of the day (Pomerantsev, 2019). Populist governments engage in a continuous struggle within the symbolic space of doing politics that entails the promulgation of ideology-driven voluntarist policies aimed at garnering popular support, or at substituting weak democratic or professional legitimacy. This pattern of addressing public matters disconnects the policy discourse from genuine public policy problems that are determined on the basis of evidence and deliberation. This has major implications for educational policy, and eventually for schools. The most visible effect of populism on education is turning education into a battlefield of “*kulturkampf*” (culture struggle) in order to create space for indoctrination. The less obvious effect is misdirecting attention away from problems related to educational outcomes. In many of the Central Eastern European countries, where populism has led to a way of wielding power that is autocratic, or in Hungary, where a fully-fledged autocratic regime has been created, the impact of populism on schools is much stronger and more substantial: it leads to the centralization of governance along with the imposition of restraints on school autonomy and with the tearing down of the institutions that normally ensure the effective functioning of education. All things considered, populism, especially autocratic governance in certain Central-Eastern European countries may switch off reflection about the changing societal and economic environment of schooling, may make political submission the “adaptive strategy,” and may remove the institutional preconditions for adaptation to future challenges.

1.5 Old and new inequalities

All education systems are operating under the pressure of various societal inequalities. While in a small number of countries these inequalities are relatively minor, allowing schools to provide relatively high quality education associated with strong equity, in the majority of developed countries education systems are transforming strong societal inequalities into educational inequalities, or even widening existing societal gaps. Some of these inequalities are unsolved traditional ones that have been rolled over for a long period of time, like the poor educational performance of the disadvantaged, immigrants, or Roma pupils. Others are relatively new ones, either in the sense that they have been magnified by recent changes, such as the digital competence gap, or they are gaining importance because of growing awareness of new factors such as gender, age, or various identities. The stubborn survival of educational inequalities is indicated by the fact that new gaps typically emerge along old inequalities; for example, the digital competence gap emerges along social divisions. Large educational outcome gaps that emerge along socio-economic and socio-cultural status, residential status, ethnicity, and mother tongue, religion, gender, or personal abilities are imposing pressure on education systems. These inequalities – beyond dramatically worsening the life chances of a large number of pupils – are reducing the capacity of schools and education systems to adapt to ongoing and future changes. Inequalities may suppress adaptation through the combined effects of various mechanisms. The most important direct and indirect effects of inequalities on educational modernization (i.e. the capacity of schools to adapt) are related to the problems of predetermined learning pathways, the impact of selection and segregation on learning outcomes, the diversion of resources, and the unequal distribution of the institutional competencies of schools.

The skill demand from the labor market and social life is increasing, and will continue to do so in the future. This is increasing the demand for school graduates who are able to engage in further learning and who are able to participate in training in order to undertake high added-value tasks. This growing demand in many countries crashes against the wall of the reduced pool of pupils with acceptable performance levels because of the large proportion of those who are leaving formal education too early and/or with very poor basic competencies. In those education systems where the high proportion of failing pupils is combined with their separation, social selection and ethnic segregation further widens learning outcome gaps and increases the pressure of inequalities concerning how schools function. For example, since selection creates socially and ethnically homogeneous schools, they accumulate only those institutional professional competencies that are required for those students who they enroll. In other words, the “specialization” of schools to educate pupils with certain backgrounds prevents them from further developing those capacities that are needed to provide a rich and effective learning environment for children with a wide range of backgrounds. In many cases, the struggle to reduce educational inequalities within basically unchanged institutional frameworks entails concentrating available financial, human, and other resources, leaving limited latitude for modernization efforts.

1.6 Changing gender roles

A growing awareness of gender inequalities has put education under pressure to prevent them from evolving at an early age for both boys and girls. Due to changing gender roles in the wider environment of schools, and due to the growing acceptance of a gendered view of societal problems, this pressure is expected to grow further in the forthcoming decades. The most obvious ongoing change is life course convergence between men and women (Esping-Andresen, 2002). However, in spite of the undeniably positive changes in relation to gender relationships, these go hand in hand with stubbornly surviving inequalities such as the pay gap or lesser representation of women in certain positions or jobs. In addition to these drawbacks, positive changes often magnify second-order inequalities. For example, as Esping-Andersen has observed, the “masculinization” of the female life course amplifies obstacles to career advancement, such as gender segregation at work, and the unequal division of domestic responsibilities (Esping-Andersen, 2002). These obstacles are

calling more and more attention to the hidden mechanisms of gender socialization that to a certain extent occurs in education.

When considering the role of schools in determining the life chances of the two sexes, there are three aspects of schooling that deserve attention: learning performance differences between boys and girls, the different learning pathways available for boys and girls, and the socialization impact of schools; that is, the shaping of those attitudinal and behavioral patterns that determine gender-related norms at later stages of the life course. As far as learning performance is concerned, there are typical differences between boys and girls. For example, girls tend to perform significantly better at reading literacy, while – to a much smaller extent – boys perform a little bit better at mathematics and science. There are no unambiguous evidence-based explanations for the differences in performance between boys and girls. However, even if we look at the much better literacy test results of girls, the gap is not comparable to the gaps which emerge along other dimensions of inequalities, especially on the basis of social status. Nevertheless, these differences might be contributing to the second type of gender differences, and to the problem of the rather different educational pathways of the different genders. For example, higher literacy performance increases the odds of enrollment in upper-secondary general education. The differences in the choice of programs, however, are much larger than the differences observed in average performances, thus the second factor does not explain the first one. This leads to the third gender aspect of education: the role played by schools in the wider socialization space of girls and boys. Attitudes and behavioral patterns related to gender roles are social constructs. Therefore, they are very much dependent on cultural traditions and societal circumstances. Schools, being social constructs too, have limited latitude to “overwrite” the norms of the societies in which they are embedded. Having said that, it is not suggested that education does not have some elbow-room for acting as a change agent. Avoiding invisible or overt forms of gender biases requires a great deal of awareness, and should become an integral part of professionalism, both in terms of classroom instruction and in how schools function.

1.7 Climate change

Although, concerns about the environmental effects of human activities are not new, during the last decade climate change and its impact on almost all aspects of life became one of the most important challenges. Inevitably, the pressure for preparing schools for providing adequate responses to climate change has strengthened. Consequently, the former very broadly defined educational initiatives to support sustainable development are becoming more and more targeted to raising awareness among pupils, to help pupils understand the causes and consequences of climate change and to prepare them to cope with its impact. Climate change is a global phenomenon with many different local effects. Contemporary climate change models already allow forecasting these effects for individual countries and individual geographic regions within countries. This makes possible a much stronger contextualization of educational programs. Education has the potential to teach pupils the way how they can reduce their own climate footprint in their own environments. Obviously, this is not simply an educational matter in the narrow sense: whole schools as institutions should change the way how they are functioning in order to reduce their climate footprint. If it occurs with the active involvement of parents and pupils, schools might become effective socialization agents.

1.8 Globalization, internationalization

The second wave of globalization that has occurred during the previous three decades has transformed all the relevant external references for education. Due to the globalization of production, services, and trade, labor markets have transformed. Due to globalization, international migration has intensified and the growing number of global challenges has changed the nature of politics. The globalization of communication has had major effects on cultures and identities. Since all these changes are gradually rewriting the traditional frameworks of social life, the inevitable backlash

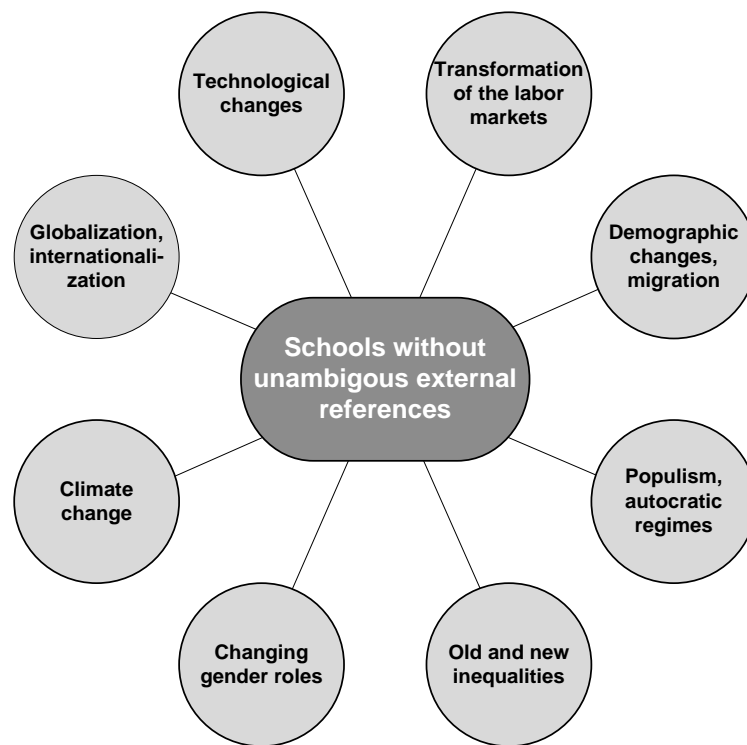
has made globalization the bogeyman of our time: it is considered by many a “neoliberal conspiracy” designed to secure the power of multinational enterprises, an attack on national identities, a process superseding national cultural traditions, or endangering national self-determination. While globalization has various negative side-effects, most of the former stands are based more on ideological disapproval than on evidence-based deliberation. In a sense, this pollutes the discourse about how schools can prepare pupils for living in a globalized world. Despite these difficulties, expectations towards schools are high. All adults in the forthcoming decades should be enabled to engage in offline and online activities in international frameworks at a global scale. This requires various entry or threshold competencies and strengthening global references in the cultural, historical, and economic knowledge that students acquire in schools, but also requires a kind of socialization which naturally ushers pupils into international, cross-cultural, multilingual, and online relationships.

2. An ongoing educational paradigm shift

2.1 The fragmented character of the discourse

A challenge-by-challenge overview of the most important threats and opportunities to education systems already suggests that the adjustment pressure on schools is large. The confluence of all these changes makes even the not-so-distant future unpredictable. These challenges, even separately, are generating high expectations towards schools that are already overwhelmed by them because they simply cannot cope with too much change at the same time. In fact, there is no school that is capable of meeting all of these expectations. Therefore, many schools either concentrate on a single issue by which they mark out an area in which they may be “special,” or do not bother about addressing the issues at all. The widely shared feeling of the powerlessness of educators stems from the fragmented nature of the discourse about future challenges. The bottom line is that without unifying the very diverse changes that are generating external expectations towards schools into a single change strategy, even in the best case schools will cherry-pick as they see fit and will attempt to “modernize” how they operate within the existing traditional framework of schooling. In other words, while the promoters of a single-issue approach to educational change struggle for more attention and resources for their causes, such as climate change, digital preparedness, gender awareness, or minority inclusion, they might in fact contribute to the preservation of a system that is losing relevance rather quickly. In addition to this, even if the future effects of certain single challenges can be projected, their cumulative effect remains obscure, leaving schools without unambiguous external references.

Figure 1. Fragmented discourse about educational change



The consequences of the fragmented character of the discourse on educational change reveal the weakness of traditional modernization narratives. The former is based on the assumption that governments and schools (eventually, educational experts) are interpreting the changes in the environment of schools and translating them into curricular and instructional guidelines for implementation. Originally, modernization referred to adaptation to the patterns of the most developed industrial societies of the 1950s and 60s. In the late 1960s and 70s the validity of this development model was called into question by many on the basis of a strong critical analysis of its risks and side-effects. Jean Francois Lyotard published a book on the “postmodern condition”¹ in 1979 that broke the belief in the unitary pattern (the “metanarrative”) of modernization and introduced the term “postmodernism.” Postmodern reflection in the 1980s did not terminate the basically pattern-following nature of modernization discourses, but made it extremely fragmented. Overall, modernization efforts were replaced by incremental policies, single-issue developments, and by the determined collection of “good practices.” The recent fragmentation of the discourse about future challenges is still rooted in the “postmodern condition” of educational policy-making and educational science. This approach relies on the cumulative effect of incremental changes without reflecting on the traditional broader strategic and institutional frameworks within which “catching-up”-type incremental changes are to be initiated and implemented. Later on, on the basis of the undeniably positive results of development on the one hand, and its unfolding negative consequences on the other, a more balanced theory of modernization emerged. Anthony Giddens, Ulrich Beck, and Scott Lash introduced the term “reflexive modernization.”² In their view, modernization is a change process based on learning and correction that takes into consideration the social, economic, and environmental hazards of development. In other words: modernity is not dead, but it is perpetually reconsidered and reproduced. In the meantime, due to various changes in the

¹ Lyotard, Jean-François (1979). *La condition postmoderne: rapport sur le savoir*. Paris: Minuit.

² [Beck, Ulrich, Giddens, Anthony, Lash, Scott](#) (1994) *Reflexive Modernization. Politics, Tradition and Aesthetics in the Modern Social Order*. Stanford University Press.

period of the New Economy, critical reflection on modernization strategies was supplemented with critical reflection on globalization, widely regarded as the expansion of the Western development model. Our contemporary understanding of the concept of modernization is based on the work of Zygmunt Bauman, who introduced the term “liquid modernity” in 2000.³ In his view, the emphasis has shifted from the unambiguous frameworks created by society to the choices made by individuals in a fast changing social environment.

The concepts “reflexive modernity” and “liquid modernity” have had a great impact on thinking about the fundamental purpose of education. Due to the loss of belief in the predictability of the future, education is no longer expected to integrate pupils by “socializing” them into ready-made social and economic frameworks. Instead, among the circumstances of overall uncertainty, education should focus on empowering individuals to adapt to changes and actively shape those changes. This new approach focuses on the ability of individuals to manage their course of life. This is the approach that made the doctrine of lifelong learning dominant as early as in the late 1990s. Also, the focus on individual adaptability resulted in the radical reconsideration of desirable learning outcomes that education should promote (Radó, 2017).

This shift offers the chance to overcome the fragmentation of the discourse on educational change: the common element of all future challenges to education is not hidden somewhere in the projected direction of changes in the environment of schools; it is change itself. The adaptive skills that are required to cope with technological, economic, societal, or cultural changes are basically independent of the actual context of their application. Therefore, it is not impossible to determine the core set of skills that schooling should serve. The ongoing paradigm shift in education – which will be briefly described in the following section – is based on the consequences that stem from the new way of determining our learning outcome expectations towards schools. The real disruptive nature of focusing on a new set of targeted learning outcomes is created by a simple fact: such goals determined in terms of adaptive skills cannot be delivered within the still prevailing nineteenth-century institutional pattern of schooling.

2.2 Mainstream strategies for adaptation

If we are to assess the preparedness of education systems to adapt to future changes in the CEE countries, we need to have a set of references at our disposal against which we may do so. Partly due to the fact that the relevance of international comparisons decrease linearly with distance, and partly because all developed countries are still in the process of experimenting with various elements of the necessary educational changes, this reference framework cannot be extracted from the practices of a single country or a group of countries. In fact, using the old way of referring to the “good practices” of leading countries would be very misleading. Most probably, they can hardly be implemented in a very different context and they would serve only as mere substitutes for a home-grown vision. Instead, on the following pages a distillate of long-term mainstream adjustment policies and developments will be offered, inspired by various resources (Cooper, 1993; Trilling-Fadel, 2009; Ball-Junemann, 2012; Radó, 2014; OECD 2015; Zmuda-Curtis-Ulman, 2015; OECD 2016; Radó, 2017).

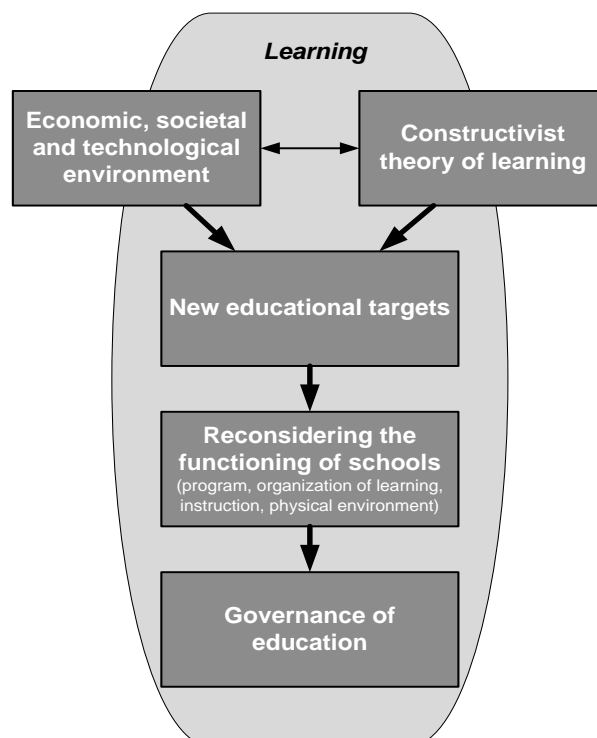
The point of departure of this paper is the already widely shared observation that we are witnessing an ongoing paradigm shift in education science and educational practice. This fundamental change of approaches and underlying concepts has two major sources. The first is the already briefly discussed rapid change in the environment of education that calls for the reconsideration of the goals that we think education should serve. The second is the widely accepted constructivist theory of learning. This theory suggests an alignment of the way we determine these new goals and compels reconsideration of how teaching and schools might reach these goals.

³ Bauman, Zygmunt:(2000) *Liquid Modernity*. Cambridge: Polity Press.

Earlier main theories of learning, such as behaviorism and cognitive psychology (which are still determining the work of active teachers to a great extent), are based on the notion that reality is external to the learner and meaning is derived from its objective structure. According to this perspective, in the course of learning the mind “acquires” symbolic representations of reality. According to the constructivist view, however, meaning is determined by the prior experience of the learner. The mind is a builder of symbols by which reality is represented and creates meaning in relation to what we observe or learn. In other words, learners do not “acquire” knowledge, but they construct it. As Peter A. Cooper wrote: “For the constructivists, learning is problem solving based on personal discovery, and the learner is intrinsically motivated. The learner needs a responsive environment in which consideration has been given to the learner’s individual style as an active, self-regulating, reflective learner” (Cooper, 1993). Since learning is an active, constructive process, the purpose of education is not “transferring” knowledge, but helping learners develop those mental construction toolkits that are embedded in their learning environments and that create adaptive behavioral patterns. According to constructivist theory, effective learning is based on the active participation of the learner, determined by the prior knowledge of the learner, happens through active interactions between the learner and his/her social and material environment, occurs both online and offline, is personalized, creative, and innovative (Radó, 2017).

The traditional use of the theories of learning is their application to determine the characteristics and methods of good teaching. However, instruction is only one of the core functions that schools and the education system as a whole undertake. The existence of teachers who might be prepared to apply instructional and evaluation methods based on the constructivist theory of learning but who work in a traditional institutional environment is one of the most striking contradictions of contemporary education systems. Therefore, our expectations towards all aspects of education must be reconsidered. We need to set different targets for learning, to reconsider how schools undertake their core functions, and to adjust how education systems are governed. (The consequences of the new educational paradigm for how schools are operating and for the governance of educational systems will be discussed in Sections 3 and 4.)

Figure 2. Elements of the new educational paradigm



The ongoing educational paradigm shift has three major components: the reconsideration of desired learning outcomes, the growing demand for the personalization of learning, and the consequences of the former for the patterns of institutionalized learning pathways.

The heart of the educational paradigm shift involves setting new goals for learning that schools should strive to achieve. Since the late 1990s the prevailing underlying concept of international mainstream educational policies has been based on a “learning outcomes oriented approach.” This approach is the combined result of two parallel processes: a growing emphasis on learning and learning pathways instead of emphasizing teaching and school structure (lifelong learning), and the gradual reconsideration of relevant school knowledge – i.e. the growing focus on applicable knowledge (that is, on competences) (CEDEFOP, 2009, Radó, 2014). Competences are widely defined as composed of knowledge, skills, and attitudes. The separation of skills and attitudes does not stem from psychological theory; it rather serves the specific needs of educational policies for determining and leveling educational targets in an operationalizable way (Radó, 2017). Due to the fast changing technological, economic, and social environment, the knowledge component of competences (i.e. factual knowledge) has been largely devalued as it is now regarded more as the raw material of learning than its goal. Due to this emphasis shift, contemporary policies are increasingly setting goals related to skills. However, the development of those competencies that pave the way for successful further learning (such as reading literacy and applicable mathematics competencies) are still high on the agenda of educational policies, especially in connection to the learning outcome gaps that have emerged along the various societal dimensions of inequalities.

Thus, the three sets of learning outcomes emphasized by contemporary educational policies – often referred to as “Twenty-first Century Skills” (Trilling-Fadel, 2009, OECD 2010, World Economic Forum 2016) – are the following: (1) basic competencies measured by many national and international standardized student performance assessment systems, (2) adaptive skills that are independent from the actual context of their application, such as creativity, individual and collaborative problem-solving, critical thinking, flexibility, social cooperation skills, etc., and, (3) a separate set of skills widely considered as threshold competences for working in a globalized labor market, such as digital skills, English-language skills, and intercultural communication skills. (These threshold skills are emphasized in order to reduce transaction costs on a global labor market.) These are the learning outcomes that have the potential to equip learners to adapt to future changes – whatever these may be. In turn, this is how education can adapt to the ever greater unpredictability of the future, for which schools have to prepare students.

The second critical element of the educational paradigm shift is personalization. The Fourth Industrial Revolution is about flexibility and personalization: customized mass production with 3D printers, personalized intelligent offices and homes, self-driving cars, etc. This wave of personalization does not leave public services untouched; for example, there is growing demand for personalized health services organized around the individual needs of patients, not around specialized service providers that are able to target only one aspect of the individual condition of patients. Education is not an exception in this regard, especially in the light of the constructivist theory of learning. Schooling has to be organized around individual learning needs (Zmuda-Curtis-Ulman, 2015).

Thus, the rather radical shift that is required involves focusing on individual learners and learning, instead of focusing on teachers and teaching. Of course, the focus on the needs of learners is not new in the past half-century of educational science. What is a rather new development that has occurred during the previous decade is expanding this focus to the totality of individual learning environments. Learning does not occur only in classrooms, and the development of the skills we intend to support is the result of all learning experiences within and outside of schools. Individual learning environments are composed of contexts of learning, learning cultures, and physical spaces within and outside of schools (Radó, 2017).

- *The context of learning*; that is, the various activities into which learning is embedded. Beyond learning in the classroom, the context can be almost anything; doing sports, playing board games, chatting using any digital devices, playing guitar at a music school, visiting museums, watching science-fiction films, editing a school journal, building sandcastles, or taking care of grandparents.
- *The culture of learning*; that is, the characteristics of the relationships among the people participating in learning activities, such as reflection, cooperation, expectations, feedback, a sense of security, diversity, etc.
- *The physical space of learning*; this obviously includes schools, but much more than that; in essence, any places where any activities are performed that involve learning experiences of any kind: for example, the home, the playground, a swimming pool or a movie theatre. It also includes all physical objects used within these spaces: furniture, digital devices, toys, or a cello.

The effectiveness of learning is determined by the characteristics of individual learning environments. In line with the constructivist theory of learning, high quality individual learning environments – both within and outside of schools, and both online and offline – should meet certain requirements. These requirements, which refer to all three elements of the individual learning environments, are the following (Radó, 2017):

1. Personalization;
2. Motivation, the intensity of engagement in learning;
3. Learning based on social interaction and cooperation;
4. Sense of security;
5. Satisfying the curiosity and interest of the learner;
6. Diversity of worldviews from multiple sources;
7. Diversity of methods of learning;
8. Diversity and permeability of contexts of learning;
9. Continuous feedback, formative assessment;
10. Creative and multifunctional learning spaces.

In order to see the implications of this very brief overview of the characteristics of high quality individual learning environments for schooling, we need to deal with the word salad of terms by which we describe alternatives to the traditional “frontal” organization and methods of teaching: differentiation, individualization, and personalization. The meanings of these terms are defined in the following table (Bray-McClaskey, n.d.).

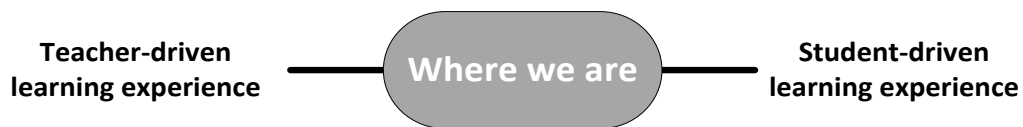
Table 1. Individualization, differentiation and personalization

Individualization	Differentiation	Personalization
Instruction that is paced to the learning needs of different learners. Learning goals are the same for all students, but students can progress through the material at different speeds according to their learning	Instruction that is tailored to the learning preferences of different learners. Learning goals are the same for all students, but the method or approach of instruction varies according to the preferences of	Instruction that is paced to learning needs, tailored to learning preferences, and tailored to the specific interests of different learners. In an environment that is fully personalized, the learning objectives and content, as well

needs.	each student.	as the method and pace may all vary.
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As this comparison clearly shows, the key difference among the three in-classroom learning environments is control (Zmuda et al., 2015). With individualization, students are in charge only of the pace of learning; everything else (goals, content, and product) is controlled by teachers. With differentiation, teachers tailor all elements of the learning environment to the individual learning needs of students, but these elements still remain teacher controlled. In contrast, with personalization students play a significant role in determining the type of tasks, the content, and the direction of learning. In a classroom with a personalized learning environment the larger aims of learning are fixed, but the content and methods of exploration are determined by students. Of course, school education will never be fully personalized. Especially due to fears of the emergence of large factual knowledge gaps – whether valid or not – a certain level of teacher control will remain in place. What the promoters of personalized learning argue for is the need for a different equilibrium: “A balanced approach through which the teacher and student collaborate in the design of the learning experience” (Zmuda et al., 2015). Therefore, the meaningful goal for the renewal of education is not the replacement of old frameworks of learning, but the continuous enrichment of online and offline individual learning environments in schools and outside schools in order to better promote effective personalized learning.

Figure 3. Teacher-driven versus student-driven learning experience (Zmuda et al., 2015)



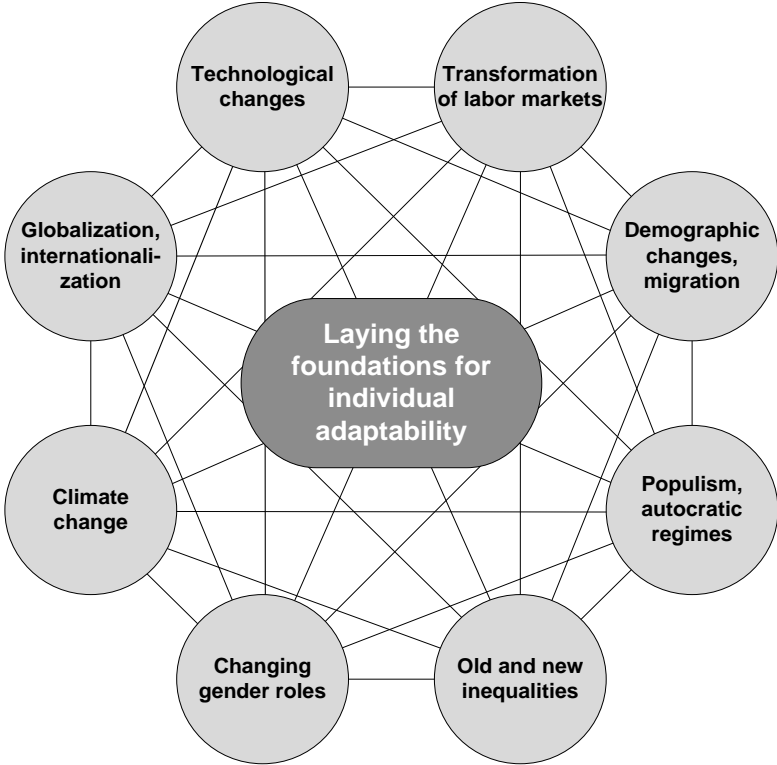
Personalization builds on differentiation and individualization at an early phase of institutionalized learning, but at the age of lower- and upper-secondary education the latitude for personalization should grow. This gradual introduction of increasingly personalized learning has to be applied to all in-school and out of school contexts and terrains of the very diverse set of individual learning environments of students. What is important to keep in mind in relation to classroom learning is that differentiation cannot be skipped over: there is no jumping from traditional frontal instruction to personalization. Self-driven active learning should be fostered from the beginning through individualization and differentiation. Those pupils whose early learning socialization occurs in very traditional content-and-teacher-driven environment will only with difficulty adapt to a personalized learning environment at the secondary level, or later on in higher education.

The third element of the ongoing paradigm shift follows from the two previous ones; it is the changing pattern of learning pathways in formal education. First of all, due to the growing skill demand for most jobs and the increasingly frequent need for changes of profession, there are calls for the universal attainment of upper-secondary qualifications, a challenge that has almost been met in most developed countries. In addition, due to the emphasis on new types of expected learning outcomes (i.e. on learning and adaptive skills) the weight of general education is increasing. Therefore, training for narrowly defined vocations is increasingly delayed to post-secondary education, to higher education, or to on-the-job training. The expansion of general education and the increasing length of time spent in formal education are generating a new wave of participation in higher education. The growing demand for personalized learning is already resulting in the diversification of individual learning pathways. This is already visible in the increasingly diverse

patterns of higher education participation and in the continuously lengthening transition period from learning to work. It is expected that the relevance of learning pathways oriented towards accumulating qualifications will further decline, and will be gradually replaced by learning careers primarily aimed at accumulating validated skills. All these changes in the patterns of the early stages of life courses will further aggravate the challenge to education systems of adapting.

On the whole, the shift of emphasis – from expecting education to adapt to all individual external challenges to improving the adaptability of individuals to any changes, and the strategy of realigning education to foster adaptive skills in a personalized way during a lengthier period of general education – involves expectations that are much more easily interpreted by educationalists than an overwhelming challenge-by-challenge approach to future changes. The former approach has the potential to overcome the fragmentation of the discourse on educational modernization by streamlining the problem of adapting education to the need to lay the foundations for individual adaptability. Of course, this does not mean that education should not become more sensitive to gender- or climate-change-related matters, or that schools should not invest more resources into improving digital skills or English language competencies. The integrated approach offered by the ongoing educational paradigm shift simply paves the way for more manageable institutional strategies and educational policies aimed at improving the capacity of schools to better serve the adaptability of individual students.

Figure 4. An integrated approach to future challenges



3. The conceptual foundations of school-level adaptation

3.1 The problem

As seen in the previous section of this paper, we expect schools to become able to equip learners with those skills that in later stages of their life-course will enable them to adapt to any changes, especially to the largely unpredictable outcomes of future challenges, as listed in Section 1. For this,

we can supplement traditional goals with new types of learning outcomes, such as adaptive skills, and certain "threshold" competencies. In order to make learning more personalized, we expect learning in school to be appropriate for the totality of the individual learning environments of students. We also expect school systems to allow for participation in an ever lengthier period of general education and allow for greater diversification of learning pathways.

Needless to say, in most developed countries most schools – and education systems on the whole – are far from being able to live up to these new expectations. In most schools, things revolve more around teaching than around learning. Traditional schools are designed, organized, and operate according to the physical, organizational, and logistical needs of teaching, leaving very limited space for active, effective, and personalized learning. All of the core functions of schools are undertaken in alignment with this traditional, still very much nineteenth-century concept of mass education: school programs determine the same learning targets for all, learning is organized along the division of labor among teachers, assessment is based on standard expectations applied to all, and instruction is very much driven by content. The inflexibility and closeness of traditional schools create the most important contradiction in contemporary education systems: the growing diversity of perceived learning needs of students on the one hand, and the standardized "mass production" logic of school operations on the other. This contradiction is manifest whenever educators run up against clashes between school competences that are lacking and dealing with students whose support needs differ from the non-existent "average." In turn, this contradiction perpetually increases the proportion of students who are "not compatible" with schools, creating an inexhaustible reservoir of raw material for a shift in responsibility. (Of course, this contradiction becomes visible only if the various forms of professional development that target individual teachers succeed in changing instructional routines to more differentiated teaching that reveals the differences among individual students.) In addition to the former, the closedness of traditional schools prevents them from engaging in regular cooperation with outside agents who nonetheless play an important role within the individual learning environments of students (Radó, 2017). The gravity of this problem is indicated by many symptoms, such as the resistance of schools to incorporate online learning opportunities into their teaching strategies, the prevailing reliance on student homework that serves exclusively to extend the time deployed on school-based learning, and the declining relevance of in-school learning compared to learning experiences offered by the offline and online out-of-school activities of students.

3.2 The "new school"

Traditional schools are neither good nor bad; they are simply unprepared to provide a learning experience that is in line with the changes brought about by the ongoing paradigm shift in education. Thus, the question is: what are the characteristics of the "new schools" against which the institutional preparedness of education systems for promoting active, personalized, and active learning may be assessed? Reconsideration of the recent underlying operational logic of schools indicates that there are four points of departure: (1) a new approach to the design of school programs that ensures the personalization of learning; (2) a new way of organizing learning in schools that integrates formal, non-formal, and informal learning; (3) the development of teaching praxis (instruction, evaluation, and collaboration with other teachers) in order to make the former more differentiated, personalized, and able to integrate offline and online learning; (4) opening up schools to cooperation with out-of-school agents that may provide opportunities and support for personalized learning and the creation of local learning networks.

In contrast to the recent alignment of school programs that serves to demonstrate how individual schools are different from others and that are based on subject-oriented specialization, programs should be generated from the individual learning plans of students. (Individual learning plans are not new; these are widely applied in the education of special-needs children, and recently some schools have experimented with expanding this instrument to students at risk of early school leaving.) These

plans should be based on the learning activity map of students that includes in-school and out-of-school activities, should incorporate the support needs of students, and should be developed in cooperation with school staff, learners, their parents, and other out-of-school agents. Expanding personalization to all students calls for a school program that contains all the institutional competences (i.e. professional support competences and all sorts of learning experiences) that schools are able to provide and that create the basis for further development and enrichment.

If the organization of learning is to be adjusted to the new type of operational logic determined by a different type of school program, the dominance of learning subjects in offline classes has to be replaced by a much more diversified logic by which learning equally happens offline and online in classes, in project teams, in school activity teams, in out-of-school activity teams, during individual development, or alone online in school. The diversity of the contexts of learning experiences offered by schools automatically generates large demand for specialists who can provide various types of support for learning. Obviously, the precondition of this organization of learning is liberating teaching and learning time from the pressure of "content to be covered"; beyond the minimum core, not all students will learn everything. Also, the diversification of the contexts of school learning will generate a large number of logistical problems in connection with the use of human resources and facilities that schools have never had to deal with. Probably the greatest challenge is converting recent school facilities optimized for teaching on the stage and learning in the theatre with buildings able to provide the creative space for any type of learning contexts.

What decades of the professional development of teachers working in traditional schools has attempted to change with rather limited success, placing teachers into different institutional contexts will do much more effectively. Instruction should ensure the active participation of students in their learning. Therefore, communication in the classroom should become multilateral and teachers should use a great variety of instruction methods. The foundation of the renewal of teaching, in line with the overall reconsideration of how schools operate, is the diagnostic unfolding of differences among students. The basis of evaluation has to be the progress of individual students, and students should participate in establishing the underlying criteria. The greatest challenge of the new education paradigm is not necessarily enriching the instruction repertoire of teachers; it is more related to changing the underlying role perception of teachers. As István Nahalka has written: "In the constructivist pedagogy the role of teachers in the teaching-learning process is changing radically. He/she can't be the source of knowledge; he/she can't be that key figure who transfers knowledge to the pupils, because constructivism does not recognize such processes" (Nahalka, 2003).

In most European countries cooperation between schools and external partner organizations does not reach the level of intensity and coordination that will be required for connecting the various agents of the individual learning environments of students. The recently rather poorly managed relationship between schools and their partners (pedagogical service providers, other schools, sports clubs, music schools, cultural institutions, non-profit and for-profit service providers, local self-governments, the owners of various online platforms, etc.) is basically due to the fact that all these institutions are operating on the basis of very different professional and organizational protocols. Harmonizing all these protocols is a very hard task; therefore, schools should become capable of playing an active coordination role. It is important to emphasize here the so far unprecedented intensity of the coordination that is required: it should connect schools, families, and all other potential actors around each individual student. Mapping out learning opportunities within and outside of schools for individual students and ensuring their participation in a wide range of learning experiences requires a "case manager" (or mentor) for each student. To avoid misunderstandings: this proposal is not designed to control students' lives or the totality of their learning; it relates to locating school in an "ecosystem of learning" that satisfies the learning interests and needs of all students, within which students may consider options.

Table 2. *The Traditional and the New School*

The traditional school	The new school
Fundamental goals: fragmented, acquiring subject knowledge	Fundamental goals: integrated, involves developing basic and adaptive skills
School program: beyond the common core serves for the specialization of schools	School program: serves for the personalization of individual learning pathways and the specialization of pupils
Organization of learning: dominance of learning in classes supplemented with some extracurricular activities	Organization of learning: diversified, learning happens in classes, in project teams, in school activity teams, in out-of-school activity teams and in individual development
Planning: ensures institutional capacities and competences on the basis of curriculum and the required number of teaching hours	Planning: based on individual learning plans for all pupils, ensures the institutional competences required for the diverse learning activities of pupils
Context of learning: dominance of formal and offline learning	Context of learning: connecting formal, non-formal and informal, as well as offline and online learning
Individual development: supplementary, serves for problem-solving	Individual development: part of the individual learning plan, supports personalized learning and problem-solving
Teaching: content-driven, based on routines, classroom communication is unilateral, the dominance of summative assessment on the basis of standard criteria	Teaching: goal-driven, classroom communication is multilateral, involves the application of diverse instructional methods, the basis of assessment is revealing the differences among pupils
Physical space: optimized for teaching (classrooms, staff room, school club, gym)	Physical space: optimized for learning and work in diverse contexts (variable, multifunctional creative spaces)

The reconsideration of the core functions of schools obviously calls for serious adjustments in the organizational functions that schools perform: various organizational processes, the internal allocation of resources, human resource management, the selection of teaching materials, and the management of school facilities and equipment. Moreover, changing schools will bring changes to entire local school networks. For example, the enrichment of the professional competence assortment of schools will inevitably increase the size efficiency minimum; small schools will not be able to accumulate and maintain the required variety of learning experiences. Even with fewer bigger schools, institutions within local school networks will need to make their facilities, professionals, and programs available for students who attend other schools. The dual challenge of ensuring size efficiency and the diverse social environment that effective learning requires will force the rationalization of school networks and the creation of much more integrated and inclusive educational services in many countries.

3.3 The transformation of schools

The real question for comparative research is not the extent to which schools in different countries are working according to the above-described characteristics of “new schools” – we may know the answer to this in advance. The question is much more the following: how much are schools able to adopt these – or a variation of these - characteristics? In other words, what makes schools capable of

manage change in order to overcome the path dependency created by more than a century of institutional operation according to traditional patterns?

While digging deeper into the problem of organizational change in schools, the two main themes to be addressed are the scope of school autonomy and the organizational preparedness of schools to initiate and implement organizational changes. School autonomy is not a liberty right; it is one of the most important preconditions of the quality of educational services. Schools are able to live up to legitimate external expectations only if they have the latitude and the means for change and improvement. School autonomy has three overlapping and mutually reinforcing elements: (1) professional autonomy; that is, the space to interpret externally defined goals and for the design and operation of core educational functions in a way that is adjusted to local needs and to the very diverse needs of children they enroll; (2) organizational autonomy; that is, the appropriate set of decision-making competences deployed to the management and staff of schools that is required to solve problems that emerge within schools on the one hand, and the latitude to manage key organizational processes in a way that fits the institutional context on the other; and, (3) financial autonomy; that is, the necessary flexibility in managing externally determined annual budgets in order to adjust the internal allocation of resources to actual educational needs. Financial autonomy covers areas of management such as the selection, employment, and remuneration of teachers, the planning of school budgets, fiscal management, and development. In international comparative research, understanding the actual space for school autonomy in different countries is the point of departure for understanding their capacity to change.

As far as the preparedness of schools to change is concerned, the first necessary step is mapping out the regular mandatory tasks that are deployed to schools in order to ensure continuous organizational efforts to improve the quality of the services they provide. In this respect, the most important instrument is regular institutional self-evaluation which is a mandatory task of schools in the large majority of EU member countries. In terms of the use of self-evaluation results, there is much greater diversity in Europe. In an ideal case, self-evaluation is followed up by the development and implementation of a typically three-year school development plan. Certain countries apply a rather organizational-technological approach by operating quality management systems in schools, while other countries apply a more “soft educational” school improvement approach aimed at the acculturation of schools (Fullan, 2001; Radó, 2010). However, the originally significant differences between the two approaches have faded during the previous decade because both systems have become very much oriented towards the development of institutional preparedness for the improvement of learning outcomes.

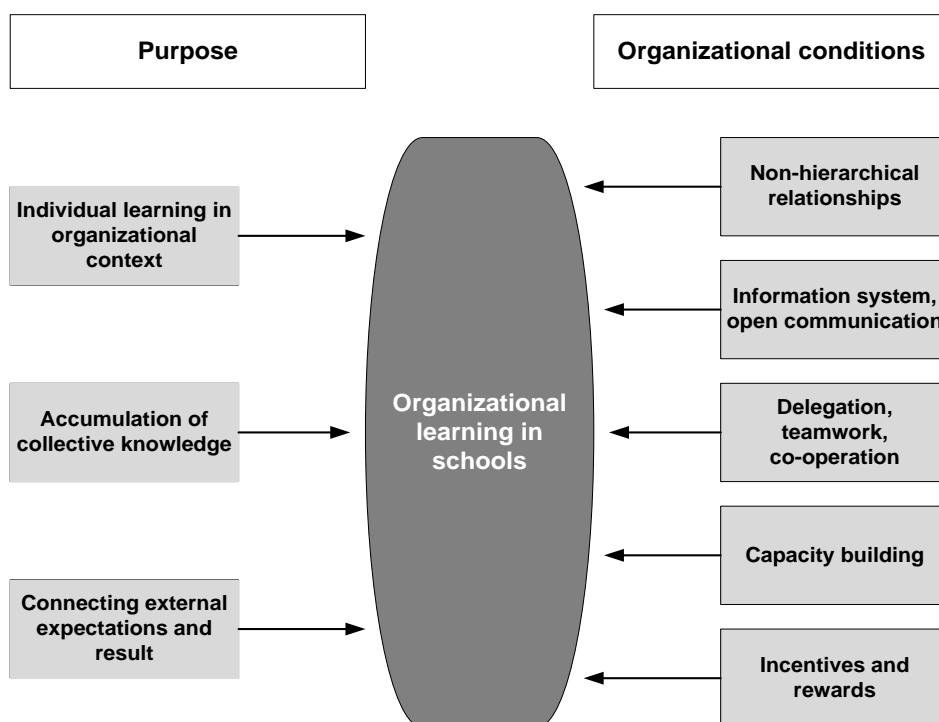
In line with the prevailing whole school approach, instead of a narrow focus on the professional development of teachers, we should consider organizational learning in schools as the most important driver of educational change. Organizational learning serves three equally important goals (Senge, 1990; Radó, 2010):

- *Attaching individual learning to the organizational goals of schools.* For example, while decisions about the type of in-service training programs that teachers attend is based on individual perceived professional development needs and the interests of teachers in certain countries, it might also be based on the professional development plans of schools that are developed along the basis of self-evaluation and the individual performance evaluations of teachers. At the same time, schools should provide a learning-friendly environment for all their employees.
- *Accumulating collective institutional knowledge.* The competencies of schools are not simply created by the summation of individual knowledge sets; collective knowledge is created by the accumulation of knowledge in teams, and by the institution-wide documentation and sharing of knowledge. Building a school with shared principles, norms, culture, and know-how starts with creating shared knowledge.

- *Connecting external expectations and educational outcomes.* A widely shared definition of a learning organization is “an organization and individuals within it with the capacity to create results that matter” (Senge, 1990). Thus, organizational learning is connected to goals; in the case of schools it is connected to the interpretation of external expectations about the learning of students.

In very general terms, there are certain organizational characteristics that are the preconditions of organizational learning. These are: (1) non-hierarchical relationships, (2) information systems and open communication, (3) delegation, teamwork, cooperation, (4) capacity building, and (5) incentives and rewards. The first condition is easily achieved by schools because they are not really organizations in terms of internal departmental divisions. However, in moving towards a more diversified activity map with more internal support functions and professionals, the temptation to create hierarchical relationships will grow. In contrast to typical recent school practices, information systems are not simply concerned with accumulating information; weakening individual information monopolies through sharing and open communication is equally important. In light of the fact that in the “new school” pattern of functioning individual students will be surrounded by multiple adult professionals who will support their learning in many different ways, fostering the presently weak culture of teamwork and cooperation in schools is essential. Obviously, this requires a gradual reduction in the share of contact teaching within the workload of teachers. As far as capacity building is concerned, education has the advantage of a preexisting, extensive in-service training system for teachers. What should be changed is the typically weak connection between training and organizational needs. In the traditional school model, the only type of mapping of institutional professional competences contains information exclusively about the initial formal qualifications of teachers, preventing the mapping out of all learning experiences that the school is able to provide. Incentives and rewards are as important in schools as in any other type of organization. Better individual performance should be reconnected with institutional goals.

Figure 5. Organizational learning in schools (Radó, 2010)



3.4 Will schools adapt by themselves?

The learning organization model helps with identifying and analyzing those school characteristics that may enable schools to adjust their functioning to the emerging new educational paradigm by managing the cycles of reflection and change. The last question to be addressed in connection to school-level adaptation is whether institutional change will acquire a momentum of its own when all these elements of the learning organization model are properly implemented. In other words, will schools ever adapt to external challenges on their own?

To answer this question, we need to dig a little bit deeper into the operational characteristics of traditional schools. The character and quality of schools as organizations is determined by formal organizational relationships to a very limited extent. It depends much more on the organizational culture of schools, which is determined by the intensity and quality of personal relationships, as well as by how schools perform their core functions. In other words, in schools implicit and informal ways of operating and strategies are much more important than formal organizational policies that are written down in basic strategic documents. Therefore, for the analysis of school operations a narrow organizational approach is of little help. Instead, the concept of organizational architecture seems to be more applicable. This includes human resources, formal and informal organization, core processes (instruction, the organization of learning, the development of school curricula, self-evaluation based school improvement, etc.), as well as overt and hidden strategies. (Radó, 2010).

In most European countries, the prevailing pattern of the organizational architecture of schools is determined by a few major characteristics (Radó, 2010):

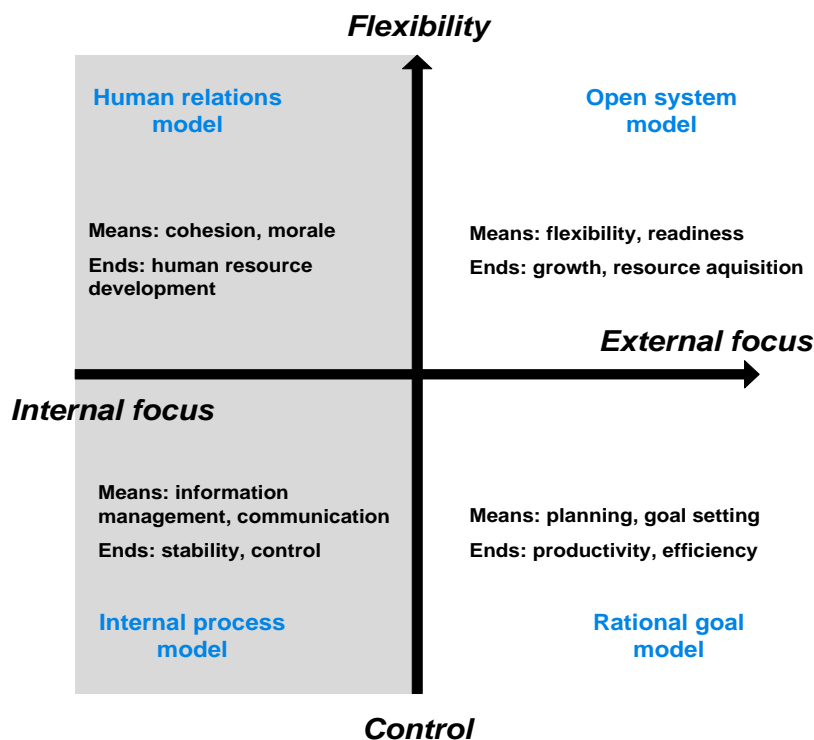
- *Schools are teacher-dominated organizations.* Schools are very special organizations in the sense that the large majority of their staff are highly trained front-line professionals with a very small support staff whose work is typically poorly integrated into the work of schools. As a consequence, school operations are driven by the interests of teachers. (Even most school directors are former teachers, whose success largely depends on their "popularity" among other teachers.)
- *Individual teacher monopolies.* Many decisions made in schools on a regular basis solely depend on individual teachers' choices and not on school policies. For example, in several European countries the pedagogical evaluation strategies that are applied, the selection of textbooks, the choice of in-service training programs, and the means of informing parents are determined by individual teachers. All these matters are often referred to as the part of the "methodological autonomy" of teachers.
- *Personal relationships overwrite organizational relationships.* In general, in an organization the norms of "professional behavior," the division of labor among employees, and how people cooperate are determined by clearly defined organizational roles and responsibilities. In schools however, almost everything depends on personal relationships and considerations, making any kind of professional cooperation very incidental.
- *The lack of departmental divisions.* Schools typically have an almost completely flat organizational structure. In fact, there are often no senior and junior positions, and no middle-layer management with specific functional responsibilities. There are two types of quasi-management positions between directors (and their deputies) and the front-line professionals: (1) classroom teachers and teachers who teach the same subjects typically form semi-institutionalized departments (permanent working groups), and (2) form masters, who – in theory - are supposed to undertake certain coordination functions among teachers who teach the same classes. Coordination within these two types of frameworks is very weak in comparison to that of departmental management actors in most other organizations.
- *Organizational processes are substituted by rituals.* Real cooperation among teachers would consume a lot of "extra time"; that is, working time in addition to contact hours in the classroom.

Due to the rather voluntary character of collaboration among teachers, a lot of organizational decisions are made in full staff meetings, creating a large gap between the formal collective decision-making competences of the teaching staff and actual decision-making processes that are typically dominated by school directors in an informal way.

- *The role perception of teachers is typically very limited.* Serving instrumental aims requires a great deal of pedagogical interpretation at the institutional level; this is not easily translated into concrete educational targets and instructional strategies. As a consequence, teachers reflect on their own work almost exclusively in terms of intrinsic aims (i.e. in terms of psychological development and cultural transmission). As a consequence, in teacher-dominated schools the implications of the changing environment of education are rarely reflected upon.
- *The lonely character of teaching and the lack of personal career perspectives for teachers.* During most of their working time teachers deliver classes alone, without being forced to engage in meaningful collaboration with colleagues. Due to the lack of a promotion ladder with different types of responsibilities attached to career advancement, personal performance evaluation methods that incorporate aspects of organizational cooperation hardly incite teachers to engage in more intensive collaboration with others.
- *The pressure to satisfy the clients of schools (first and foremost: parents) is weak.* Teaching – similarly to the work of physicians – is a discretionary profession that creates unbalanced (teacher-parent) relationships. In traditional schools, parents are not the most important reference groups of teachers and in many countries the role of parents is typically constrained to support; parents support the learning of their children, they support the work of teachers, and they support the functioning of schools.
- *The very limited role of students in the work of schools.* The culture of passive theater-type learning by students in classrooms imposes a spillover effect on how schools operate. Typically, if students are organized, their role is limited to participating in the organization of extracurricular and leisure time activities.

What is important from the point of view of the ability of schools to adapt to external changes and expectations is the cumulative effect of all these typical organizational characteristics: traditional schools are very much occupied with themselves. This situation is best demonstrated by invoking the competing values framework that serves in the analysis of various organization contexts (Quinn and Rohrbaugh, 1983). The model describes organizational contexts along two dimensions: (1) emphasis on the people in the organization (internal focus) versus emphasis on the organization as a whole (external focus), and (2) organizational preferences in relation to stability and control versus flexibility and change. These two dimensions mark out four models for ensuring organizational effectiveness (see Figure 6). Due to the above-listed typical and special features of school functioning, traditional schools can be characterized by a very strong and all pervasive “internal focus inertia.” This in turn creates a loop; it neutralizes the external goal-connectedness of organizational learning. Schools that apply the methods of self-evaluation-based school development according to the school improvement approach are typically classified by the “human relations model.” Schools that operate a quality management regime tend to become organizations best described by the “internal process model.” However, schools that operate on the basis of a strong externally oriented model are extremely rare and are typically private schools that operate in a competitive educational market. Obviously, adapting to external expectations would require a good balance between internal and external orientation.

Figure 6. The competing values model – internal focus inertia in schools (based on Quinn and Rohrbaugh, 1983)



4. The governance context of school-level change

4.1 Counterbalancing the internal focus inertia: the 'drivers'

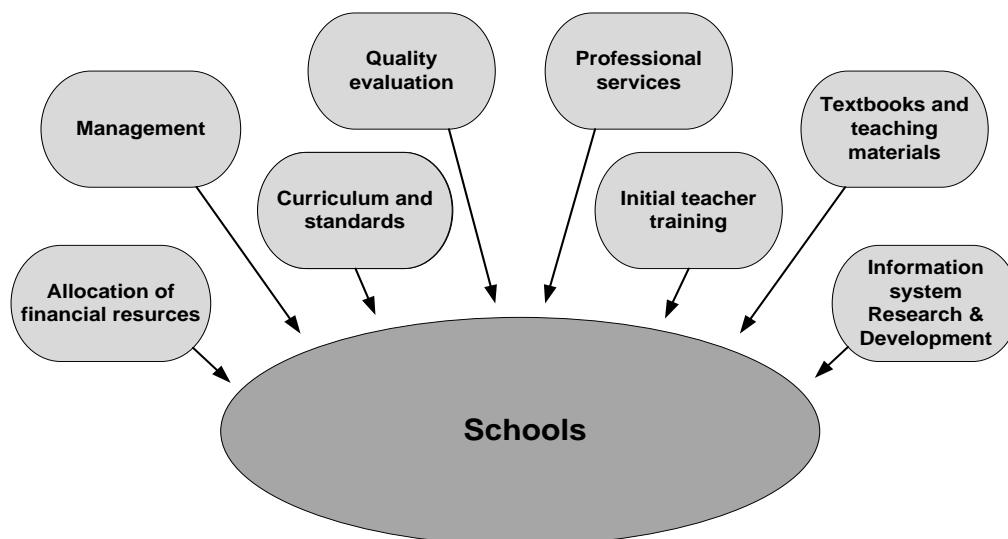
To create a balance between an internal and external focus in schools in order to ensure that they invest systematic effort in adaptation, educational governance systems should incorporate instruments with the potential of compelling, inciting, and supporting this adaptation. We may call such instruments "drivers" of school-level change. The drivers are governance instruments that convey external expectations in a way that is capable of defeating path-dependencies by overwriting old institutional routines.

The default function of governance is ensuring the smooth operation of schools, not necessarily initiating and implementing changes. However, certain governance instruments placed in the systemic environment of schools might serve as powerful drivers, if they are properly connected to established mechanisms of institutional reflection and development. For example, the various standards underlying professional accountability systems or financial incentives built into the allocation of financial resources might be effective drivers in certain circumstances. Also, procedural school management settings for strengthening the participation of clients and external partners of schools have the potential to convey strong adaptation-related expectations. Drivers might take the form of many different instruments, such as the developmental goals set by national curricula, national qualification frameworks, learning outcomes determined by separate standards, or the underlying evaluation frameworks for the regular external assessment of the performance of students. Many different educational policies that serve general modernization goals, or aim at solving identified problems may use tools of these kinds. However, the lifespan of incremental initiatives designed for policy implementation purposes rarely extends beyond government terms

which are much shorter than the timeframe of the educational adaptation process. Therefore, we need to focus on the systemic environment created by educational governance.

In order to map out the possible drivers, we need to look at the structural features of contemporary educational governance systems and their evolution over time. The systemic environment of schools is composed of various functional governance instruments that together determine the latitude, within which schools undertake their core and organizational functions (see Figure 7). Contemporary governance systems are the result of a one-and-a-half century long process of functional differentiation; within the originally unitary education management systems, various functions gradually grew into relatively autonomous sub-systems with specialized organizations, professions, and operational protocols. In theory, in spite of the continuous functional differentiation and the resulting growth in complexity, the coherence of governance systems is ensured by the fact that, in structural terms, educational management (i.e. the allocation of decision-making competences among various actors at various levels) serves as the critical path; all other sub-systems of governance are almost automatically adjusted to the changing structural characteristics of management (Radó, 2010). For example, management decentralization leads to fiscal decentralization, curriculum decentralization, or to a different type of professional accountability mechanism. While the underlying functional logic of the operation of schools is rather similar everywhere in Europe, the governance environment of school systems – being shaped by very different historical changes, traditions, constitutional frames, and the accumulated results of incremental policy changes – shows much greater diversity. Therefore, international comparative analysis in general, and mapping the various drivers embedded in governance systems in particular, requires the use of a map of the common structural core.

Figure 7. The systemic environment of schools: functional governance subsystems (Radó, 2010)



4.2 The evolution of educational governance systems

The structural evolution of educational governance systems has produced various patterns that might be viewed as governance models. It is important to keep in mind that these models rarely exist in a clear form; various governance systems in certain countries at different periods of time typically combine the characteristics of different models. Also, these models are not the stages of a linear development process. This situation is best demonstrated by the example of Hungary, which after operating a highly decentralized and complex governance system for two decades returned to an

extremely simple highly centralized administrative governance model in 2011 that is associated with the 1950s and 60s.

During the previous four decades, the overall direction of change was towards the gradual decentralization of educational governance systems in almost all European countries. As summarized in the following table (Table 3), the key instruments of educational governance gradually changed from detailed regulation and central government management by deconcentrated administrative units to a pattern of governing by learning outcomes that leaves large space for schools to determine how best to serve these goals within their special institutional context. As a consequence, the primary targets of governance have changed, too: from targeting individual teachers and teaching directly to influencing the behavior of schools and other local actors of education mainly by indirect means. Finally, professional accountability systems have also been adjusted; while in “centralized bureaucratic” systems the long route of accountability (citizens holding educational service providers accountable through central governments) prevailed, applying the means of administrative professional control, in most contemporary systems the long route of accountability now operates through local school owners (municipalities, regional self-governments, etc.). Government accountability regimes are already balanced by the stronger involvement of the clients and external partners of schools through privatization or by their participation in institutional decision-making. As far as the contemporary instrument of ensuring professional accountability is concerned, the means of quality evaluation is aimed more at informing self-evaluation in schools by the use of a diversified toolkit than at exercising central government control.

An important point is suggested by this skeleton overview of the evolution of governance systems. Since adaptation implies the involvement of the whole school, the structural precondition of applying governance drivers is the existence of a system that is based on the whole-school approach. According to this approach, schools are autonomous institutions, the professionalization of individual teachers is part of a full-fledged human resource management regime in schools, and the system of ensuring professional accountability is based on a combination of all of the contemporary instruments of quality evaluation. (These instruments are external whole school evaluation, standardized external evaluation of the performance of students with regular assessment surveys or examinations, an education information system based on student-level data, and regular and systematic feedback from the clients of schools.) In other words, the structural prerequisites of a type of governance that can be made capable of conveying adaptation expectations effectively is located only in “decentralized professional” and “highly decentralized” systems.

Table3. The evolution of educational governance models

Governance models	Primary means of governance	Primary target of governance	Professional Accountability
<i>Centralized-bureaucratic</i>	All-pervasive regulation, centralized (deconcentrated) administrative management	Teachers	Long route of accountability, administrative professional control
<i>Centralized professional</i>	All-pervasive regulation, standards, partly decentralized management	Teachers and schools	Long route of accountability, external professional evaluation
<i>Decentralized professional</i>	Procedural regulation, quality standards, decentralization and full	Schools	Long and short routes of accountability, external professional evaluation

	school autonomy		
Highly decentralized	Procedural regulation, learning outcome standards, indirect strategic steering	Schools and owners of schools	Short route of accountability, assessment of learning outcomes informing risk-based external evaluation

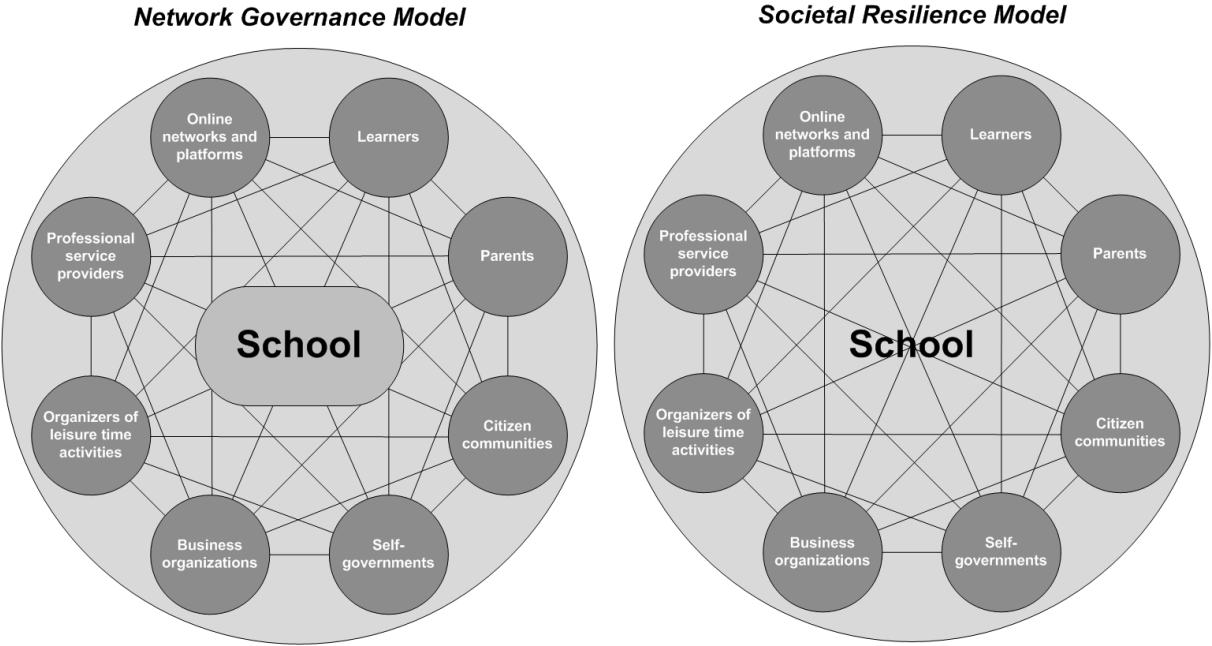
4.3 The future direction of change in educational governance

Beyond the evolution of the structural characteristic of educational governance systems in the past, our other reference for thinking about the interplay between school operations and their governance environment is our vision about the direction of future changes. As ongoing disruptive changes will force radical reconsideration of how schools operate, their impact on governance in general, and on educational governance in particular, will not be less drastic. In very general terms, governments that operate mainly with traditional instruments (i.e. scrutiny, deliberation, regulation, and implementation) will no longer be able to keep pace with the acceleration of events in the digital communication space. As Klaus Schwab wrote: “The 24 hours news cycle puts pressure on leaders to comment or act immediately to events, reducing the time available for arriving at measured, principled and calibrated responses” (Schwab, 2016). Also, prior decentralization and the involvement of increasingly informed actors with increasing power and influence will make channeling in their expectations and needs impossible through traditional institutional consultation frameworks. Presumably, governments will respond to such pressures with two types of changes. The first is further decentralization, the continued secession from the management of public services by deploying decision-making competences to where problems emerge and where they can be remedied effectively and fast; in the case of education: to schools. The second is the introduction of the elements of “agile governance.” This means operating an open and dynamic governance system that is capable of reacting to changes, on the one hand, but at the same time maintains the stability of regulatory frameworks on the other. In order to do this, regulators will build and maintain intensive collaboration with civil and business actors (Schwab, 2016).

Due to the new types of educational targets, to the personalization of education and the more diversified learning pathways, and also due to the expected transformation of how schools function, the perceived complexity of education will grow in the future. (In fact, education has always been extremely complex; what is growing is simply our awareness of this complexity.) Beyond the previous general reasons for further decentralization, these genuine educational considerations will call for a new wave of educational decentralization. In all previous models of educational governance, the long route of ensuring accountability remained dominant; while decentralization strengthened school autonomy, in spite of redeploying the power to make almost all recurrent decisions from governments to owners of schools, accountability relationships remained basically indirect and largely political. In contrast, further decentralization will replace vertical and indirect accountability relationships with horizontal accountability and the direct involvement of various stakeholders to the management of schools. The shift in emphasis from public-administration-managed education to self-governing schools will have effects on the nature of education system integration; while traditional governance systems are integrated by legislation and by certain management functions (such as a multilevel iterative system of medium- and long-term planning), in the new system information and knowledge management will play an equally important integrative role. (Since the latitude and the instruments of policy-making are largely determined by the structural characteristics of governance, these changes will radically alter the nature of educational policy-making and implementation, too.)

For the time being, two governance models seem to offer a good understanding of the future direction of change in educational governance systems: the "Network Governance Model" and the "Societal Resilience Model" (Frankowski, 2018). The Network Governance Model comes into being in a situation in which governments secede from the management of local public services and are replaced by local networks of varying composition. In education, it means that various public, civil, and business actors associate to operate schools. In spite of the participation of government agencies or local self-governments, in this model the leading role might be awarded to civil actors. These actors who are involved in such school-maintaining associations are not necessarily organizations in the legal sense – they also might be parental or citizen networks organized partly online. Recent examples of this model are rare and basically include private schools owned by non-profit organizations that have been created and operated with any kind of government or local self-government involvement. In the Societal Resilience Model, active, self-reliant groups of citizens organize local public services (e.g. establish and maintain schools) in relation to their own priorities and preferences. For this purpose, citizens create informal networks or co-operatives. These groups draw in educational professionals and the members of the group participate in the management and the operation of such schools. The rare examples of this model are the private schools that have been established by higher status/income groups of parents, primarily for their own children.

Figure 8.: Network Governance and Societal Resilience Models (based on Frankowski et al., 2018)



In the meantime, in parallel with further decentralization and due to the changing underlying logic of school operations, governance around schools will be gradually replaced by governance around learning. This change refers to the already increasing role of governments in the enrichment of individual learning environments of learners at all ages. The very likely increase in demand for various learning opportunities and for support services for learning – of which a large number of types do not even exist yet – will lead to the fast growth of the "learning industry" that will coalesce into a "learning ecosystem" (OECD, 2015; Radó, 2017). Learning ecosystems are open networks of learners and all sorts of personalized services that providing learning opportunities and learning support in schools and out of schools, offline and online. In other words, learning ecosystems include all the physical, organizational, and human elements of individual learning environments. The primary level of learning ecosystems includes all learning opportunities directly provided to learners

that serve to enrich individual learning environments. However, there is a secondary level that falls under the category of governance: these are governance services provided for the suppliers of the primary level of learning ecosystems. The most important of these are: (1) ensuring financial resources partly directly and partly by generating demand through funding for learners; (2) quality evaluation and feeding back quality evaluation information; (3) knowledge management, ensuring the information and knowledge basis for all involved actors; (4) making demand-driven professional support services available; (5) the development of individual and organizational professional capacities; and (6) market surveillance and market-conformable quality assurance. There are two aspects of government involvement that will likely call for special attention. The first is the development of online learning platforms, as well as supporting their integration into various learning contexts. The second is satisfying the emerging demand for new, highly qualified professional specialists who can work in various in-school and out-of-school learning support services. (In general, many of these professions do not even exist yet. A few examples of possible new professions: learning insurance brokers, personal learning advisors, life course analysts, intercultural communication trainers, educational game developers, AI instructors, etc.)

4.4 Governance drivers in context

As already indicated, the use of governance drivers for inciting institutional change in schools along external expectations is possible only if certain structural preconditions are in place, especially the decentralization of governance that allows for a whole school approach. When considering the various potential drivers that may be built into the system of educational governance, it should be done in context; that is, by assessing the capacity of governance instruments to compel, incite, and support institutional change in schools. Therefore, the applicability of certain governance instruments depends on their compatibility with school-level mechanisms and characteristics. For example, the use of financial incentives for schools with very limited financial management autonomy, or feeding back even sophisticated quality evaluation information to schools that do not operate cycles of self-evaluation-based school development are expensive but futile investments. Since the analysis of the potential of education systems to adapt is based on addressing the interplay between school-level and governance-level instruments of change, the very purpose of mapping them out is to reveal these potential systemic incoherencies in order to identify targets for intervention.

If certain governance instruments (e.g. various standards) convey unambiguous external expectations, schools will adjust to them with high probability. Such isomorphic change is the reason why school organizations and cultures appear to be very similar. However, deeper investigation reveals that the intensity and depth of adaption might be extremely different in different schools. The literature on organizational change makes a distinction between coercive, mimetic, and normative adaptation. Coercive change is triggered by regulations or quality assurance mechanisms, mimetic change typically involves organizational responses to uncertainty, while normative change stems from professional values and convictions. Either way, organizational conformity with external expectations is achieved, but adjustment to the underlying purposes has not been necessarily induced (Caravella, 2011). Obviously, full and meaningful adaptation can be expected in the case of normative adjustment when the underlying professional goals are reflected upon and transformed into development goals in a highly contextualized manner. Therefore, the selected governance instruments (drivers) should have the potential of throwing schools off balance in order to overcome the inertia of old operational routines and habits. For this purpose, governments should use “dominant instruments” that alter the latitude within which the staff of schools consider any institutional changes. The distinction between dominant and not dominant instruments is not identical to the difference between high-stakes and low-stakes instruments. For example, a school-leaving exam might have serious consequences for the further chances of a student without imposing any risk on a school (Radó, 2007).

As far as the contextual characteristics of various sub-systems of governance are concerned, from the perspective of school-level change the most important matter is the extent to which these governance instruments are “intelligent.” Intelligent governance means flexibility that allows for respecting the diversity of the institutional contexts in schools. For example, intelligent governance requires open, decentralized and transparent management, fiscal decentralization on the basis of the principle of fiscal neutrality, a quality evaluation system that leaves space for schools to determine their own quality standards for self-evaluation within the framework of national standards, as well as a system of demand-driven professional support services. One of the key areas of educational governance that operates with the explicit aim of inciting and supporting organizational learning in schools is quality evaluation. Again, the structural characteristics of professional accountability regimes operated by governments largely depend on the context. For example, in countries where school networks are not operating under the pressure of significant societal inequalities of any sort – like in the Scandinavian countries – professional accountability systems are rather weak. The reason why professional accountability systems are important is the fact that they might effectively incite schools to change, and as a consequence, they generate demand for know-how, for in-service training, for professional support services, and for resources for funding school development.

In connection with ensuring professional accountability, there are two distinct approaches: those of performance-oriented and quality-oriented quality evaluation systems. The major difference between the two kinds of accountability systems lies in their underlying standards. Performance-oriented systems are based on expected learning outcomes for students and on regular standardized assessment of their achievement. Quality-oriented systems are based on quality standards (areas and indicators) for schools and the external evaluation of schools. In performance-oriented systems consequences are attached to measured learning outcomes directly, while in quality-oriented systems measured learning outcomes inform school evaluation, and consequences are attached to inspection findings (Hamilton, 2003; Radó, 2007).

Table 4. The algorithm of performance and quality oriented accountability systems (Radó, 2007)

Performance-oriented accountability systems	Quality-oriented accountability systems
Setting performance standards	Determining quality criteria and setting performance standards
External assessment of the performance of students	External quality evaluation and external assessment informing evaluation
Publicized feedback of assessment results	Publicized feedback of evaluation results (in certain countries also assessment results)
Setting benchmarks for the expected improvement of performance	Identifying schools that provide poor quality service
Punishing or rewarding consequences attached to performance	Mandatory development of schools with poor quality (developmental intervention)

The last important aspect of contextualization is one of the most important preconditions for decentralization in education (and for further decentralization in the future): trust among various collaborating actors. A lack of trust has already caused various dysfunctions in the course of decentralization processes in most Central-Eastern European countries. This has paved the way for populist political movements and for autocratic governments in the region. This is especially the case when mistrust among local actors of education results in pressure on governments to step in and revoke prior decentralization measures. In turn, populism and autocratic regimes further aggravate

the lack of trust and generate sustained demand for "strong" (i.e. highly centralized, therefore, extremely ineffective, that is, "weak") governments.

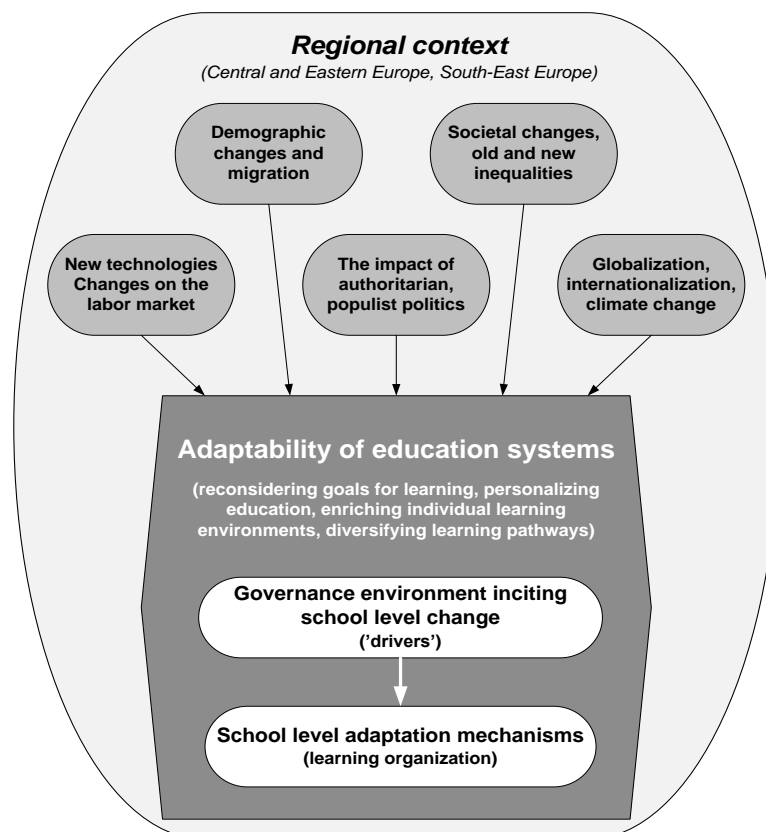
Summary of the proposed analytical framework

Any further research that aims to dig deeper into the problem of the adaptability of education to future challenges should be based on comprehensive initial mapping of the recent conditions of institutional and governance change that are in place in the education systems of individual countries. It is important to note again the following issue: the real question is not the preparedness of education systems to ensure the conditions for individual adaptability, as outlined in this paper as a kind of vision of future changes; the former are obviously not prepared, although some isolated 1.0 elements of this vision might already exist at the periphery of existing mainstream systems or as experiments at a developmental stage. The question to be addressed is the availability of those contemporary mechanisms that will enable education systems to change in a direction similar to the one that is briefly described in the previous pages.

To sum up, the proposed analytical framework consists of three layers of inquiry:

1. The real and perceived relative relevance of various external challenges in individual countries revealed partly by statistical analysis, and partly by research into the agendas of educational policies and large-scale development programs.
2. The mapping out and analysis of existing and working institutional mechanisms of school-level change that can promote the long-term adaptation of schools.
3. The mapping out and analysis of the structural characteristics of educational governance systems in general, and especially the compatibility of applied drivers that are embedded in governance with the institutional characteristics of schools.

Figure 9. Adapting to future challenges: the analytical framework



This proposed analytical framework includes 18 analytical concepts to be applied for international comparative research. (See: Table 5.) Three refers to learning for individual adaptability for which schools should become able to promote. Additional seven concepts are suggested for the analysis of the capacity of schools to change along external expectations. Finally, eight analytical concepts serve the evaluation of the ability of governance systems to incite, compel and support school level adaptation.

Table 5. Analytical concepts for research on the basis of the proposed analytical framework

Learning for individual adaptability	School level adaptation	Governance for school level adaptation
1. Individual adaptability to changes	4. Core and organizational functions of schools	11. Governance drivers of school level change
2. Adaptive skills and personalization	5. The new school	12. The systemic environment of schools, functional subsystems of governance
3. Individual learning environments	6. Professional, organizational and fiscal school autonomy	13. Decentralization in education, intelligent governance
	7. Self-evaluation based school development	14. Professional accountability in education
	8. Organizational learning, learning organizations	15. Governance by learning outcomes
	9. Organizational architecture	16. Ecosystem of learning
	10. Internal focus inertia	17. Coercive, mimetic and normative adaptation
		18. Dominant governance instruments

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