

Przegląd Badań Edukacyjnych Educational Studies Review

ISSN 1895-4308

nr 41 (1/2023), s. 231–251

META-ANALYSES
OF RESEARCH
ON EDUCATION

METAANALIZY
BADAŃ
EDUKACYJNYCH



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Theoretical Foundations and Management Models in Education as a Response to Risk and Uncertainty. Meta-Analysis of the Effectiveness of Education Management Models

<http://dx.doi.org/10.12775/PBE.2023.011>

Abstract

The process of building knowledge in the field of management of education started relatively late and it is still being developed. It is also closely interrelated with the effectiveness of educational processes. This article is meant to show the paradigm shift, which is occurring in contemporary education, in which the abandonment of the centralised models of political interventions has resulted in the search for new solutions that would fit into the current need to accelerate the development. This need is reinforced by the pace of the ongoing socio-economic changes, some of which may be difficult or impossible to predict. The situation gives birth to new, more challenging problems as well as to the need to impose new models of education management. It is therefore of utmost importance to provide an overview of the main theo-

retical positions and management models in education, the evaluation of which is a response to the new prerequisite to cope with risk and uncertainty.

The aim of the article is, therefore, to conduct a metaanalysis of these theoretical positions and models. The order of the analyses consisted of three key categories (analysis criteria) adopted by the OECD in the description of the education system: input resources, internal school processes and output resources, as well as the relationships between them as the basis for showing the ongoing changes while rejecting the existing paradigms. In English-language literature, systematic literature reviews are already standard today. Hence the proposal to use such a method, the purpose of which is to indicate the need to develop a model for managing education processes in a dynamically changing socio-cultural space based on available publications.

Keywords: management of education, educational theories, risk, uncertainty.

Introduction

Nowadays, it is impossible to question the importance of management. It is crucial in the implementation of educational policies as well as in assuring the effectiveness of educational processes. The best example of this is reflected by international interest in practices from countries with highly effective education systems, which are identified by Andreas Schleicher as world-class systems. The resonance of international studies such as PISA or TIMSS leaves no doubt here. Based on the findings, but also on the analysed determinants of success in individual countries, it is possible to identify already existing trends that change the approach to management in education.

According to Thomas Kuhn, the implemented changes lead to the previously existing method of interpreting reality and conducting research being rejected, and in order to make room for better solutions, a new paradigm is adopted (Kuhn, 2001). Such alterations of the attitude can also be shown in the area of managing of the educational practices. Although the process of building knowledge in the field of educational management started relatively late and is still being developed, it has been closely linked to the idea of effective educational processes. The fundamental change emerges from the transition from functional management (operational management), originally equated with production management, into process management. An understanding of management as a systemic function and a process detached from

specific actions performed by specific actors within these systems has been rejected in favour of their subjectification, i.e., in favour of bringing their actions to the foreground and including them in decision-making processes. Therefore, an actor-focused management concept has emerged. It draws attention to processes and phenomena occurring at the organisational level and, by doing so, it has flattened some of the existing structures.

Although in the area of educational management this is not a process occurring as radically as in business companies, the tendency towards decentralisation and autonomation of schools shows a “departure” from strong vertical structures towards horizontal structures, which leaves behind organisation characterised by “impersonal bureaucracy” (Gabriel et al., 2000, pp. 6–7). This changes the linear, top-down stream of decision and control into a stream that is more aware of the bottom-up processes (Nowosad, 2021). Structures supporting the activities of the actors are created, either by inserting a so-called buffer between authorities and school or by creating a network. In this way, a simple explanation of managerial elements or functions is not only possible, but it also becomes the reasonable option.

The change in the paradigm of educational management is reinforced by global processes. Despite them not being a new phenomenon, due to the speed and intensity with which they occur, as well as the accompanying growing scale of uncertainty, they have an extraordinary impact on educational processes (Melosik, 1994). Advancements in technology, medicine, robotics, management, economics and many more disciplines during the fourth industrial revolution (4IR) are strongly related to education and are changing not only the way we live and work, but also the way we learn or should learn (Gleason, 2018). The pace and dynamics of globalisation reveal the need for appropriate investments in human resources. Risk, uncertainty, difficulty in predicting the future and in setting educational goals all affect various aspects of educational processes. Restructuration through decentralisation, privatisation, as well as proliferation of instruments for measuring the quality of education in order to ensure transparency in a highly competitive labour market are required (Nowak-Dziemianowicz, 2014; Szymański, 2014).

There emerges a very strong necessity to search for new solutions which would meet the current need for developmental acceleration, reinforced by the pace of the ongoing socio-economic changes. However, an unequivocal

indication of a single solution or model may be difficult or even impossible to predict. Even though international comparisons have already revealed many significant variables explaining why this is happening, what new management policies and practices are effective and how they can support change, there is still little information on what exact processes lead to educational change and how they are taken into consideration by global political decisions (Ruby & Li, 2020).

In the article, main theoretical positions and management models were evaluated within the range of positions and solutions implemented by various educational systems in different countries. In the process of the metanalysis the recognition axis were three key categories imposed by OECD when describing education, here they form the “scaffolding” of the article. These are: input resources, internal school processes and output resources, as well as the relationships between them and their effects on the evaluation of the management models’ effectiveness suggested in literature.

In the first part, the sources promoting the oldest solution and the longest practiced approach of the centralized, top-down management model oriented on input resources were analysed. It is worth noting that this model is still discussed in many studies, but it also functions in many countries, adopting certain modifications as an attempt to justify them in the contemporary changing and dynamic world. Subsequently, the opposite approach oriented to output resources, the most frequently pushed approach changing the face of the functioning of many educational systems, was taken into account as a model of knowledge-based control. The analyses included in the text lead to the conclusion and demonstration of these solutions and their justifications, showing the possibilities of effective organisation and management of the education system in a complex situation of change. The metanalysis of the literature in question will allow for the systematisation of knowledge on the educational processes management, recognition of the advantages and disadvantages of the proposed models, and the implementation of political interventions in situations of risk and uncertainty.

Also, it is necessary to understand that the relationship between policies and their beneficial implementation vastly depends on local cultural imperatives, and that only their mutual adjustment makes it possible to arrive at desirable educational goals (Kwieciński, 2012). Such circumstance reveals new,

ambitious challenges that require new models of educational management in conditions of uncertainty and risk. It demonstrates a paradigm shift *in statu nascendi*, in which there is a departure from the centralised model of political interventions towards activation of the local stage.

Input-oriented model

We can trace this model back to 19th-century educational systems. It was the most recognisable model in the past, typical of emerging educational systems in Europe. It is characterised by centralised, bureaucratic, control-based management with primacy of top-down initiatives. It expresses a “hard” approach to change, in which school reality is just a recipient of recommendations to be implemented (Nowosad, 2011). In such an arrangement, education is treated instrumentally. Its principles of effective organisation and administration are governed by Max Weber’s bureaucratic model (Nowosad, 2008):

- hierarchical structure, i.e., decision-making is clearly divided, and the decision-making process is vertical “up-down,”
- specialisation, i.e. procedures are fragmented, which in extreme cases leads to increasing fragmentation of processes,
- rationing of activities, i.e., there are clear procedural rules to ensure uniformity and stability of performed activities,
- formal business relationships, i.e., personal relationships and emotions are excluded from professional activities in order to treat everyone equally,
- promotion opportunities, i.e., the potential of professional promotion is inscribed in procedural structures in accordance with accepted norms,
- goal orientation, i.e., activities are directed, rational and systemic (Wenzel, 1997).

Theoreticians who analyse top-down strategies focus on factors that make it possible to manipulate change the central level (Matland, 1995). Hence, the system’s input resources are controlled by means of relevant legislation: laws, regulations and recommendations that apply to all conditions and measures, including: teacher qualifications, educational goals or distribution of financial resources. In other words, all decisions about schools are made at the core

of the system. The most detailed top-down approach was presented by Paul Sabatier and Daniel Mazmanian in 1979. Researchers identified a number of variables and, based on them, developed six conditions for a successful implementation of this strategy, ranging from clear goals, causal theory, legal structure for implementation, as well as involvement of officials or support of interest groups so as not to weaken the changing socio-economic conditions (Sabatier & Mazmanian, 1979; Sabatier, 2005).

Clear, transparent policies are usually given priority in “top-down” strategies, which is one of their strengths (Matland, 1995). It justifies production of general political principles and coherent, recognisable behavioural patterns. The top-down approach is also criticised for giving priority to statutory language as a focal point which ignores the importance of context. We may say that this approach treats implementation as an administrative process and omits or eliminates other equally important social and political aspects. There is also undivided focus on authors of new laws or regulations, who are key actors in the system, so no local initiatives are taken into account. This way, school becomes a linear executive unit in the hands of superior educational authorities.

Changes introduced in this way are devoid of rational quality control. In addition, the time between the initiative and the implementation of changes and improvements is unnecessarily extended (Śliwerski, 1998). Also, the new arrangements apply to the entire system (e.g. curricula and textbooks are developed by central authorities) and schools are merely recipients or testing grounds for ready-made materials (Nowosad, 2008). Schools are not geared towards finding solutions to problems, and the system tends to stabilise the existing structures and procedures. There is very little focus on development and improvement, but a lot of focus on eliminating or avoiding mistakes. The predominant orientation is to meet the expectations of higher-level offices, in which case standardisation and routine constitute a danger.

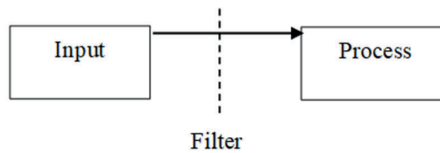


Figure 1. Input-oriented model

Source: Own study.

The fact that information passes through a certain filter (Fig. 1), because of which decision makers receive no reliable feedback on emerging difficulties, is an important aspect in the structure of the model. On the other hand, the excessive focus on the regulatory function invites illegibility of goals set by the legislator. This means that schools which fail to unconditionally meet specific “necessities” cannot suddenly be successfully affected by the set goals (Warnken, 1997). Centrally managed systems hardly respect the pluralism of pupils’ living conditions. This way, they are unable to keep up with the intensity of external changes, as they have a limited ability to react quickly and adequately. Neither do the teaching-learning processes allow themselves to be managed, as the rationing of activities fails to penetrate them, which means that teachers are left with considerable freedom in their didactic activity with students. In such a system, goals are controlled by means of trust in procedures unified regulations. There is no institutionalised system of continuous evaluation and feedback (Fig. 2).

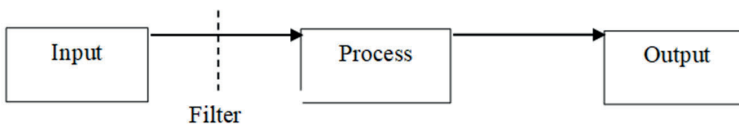


Figure 2. Input-oriented model 2

Source: Own study.

As early as the 1970s and 1980s, criticism of top-down educational control systems demonstrated that their decision-makers neglected other actors on the educational stage (Hanf et al., 1978; Barrett & Fudge, 1981; Hanf, 1982; Hjern & Hull., 1982). Proposals of bottom-up models by Kenneth Hanf, Benn

Hjern, and David Porter in 1978 identified the importance of networks committed to local service delivery, whose resources were used to identify local, regional and national actors in the planning, financing and implementation of governmental and non-governmental programmes. In the field of educational management systems, more attention was paid to educational service providers, pointing to the level at which a policy (in this case, micropolitics) is actually or can be created. An important role was also attached to context in which educational goals are to be reached (Fig. 3) and the specificity of internal processes which must be considered during the central management (input). The consideration of the context causes the newly formed propositions to be aligned with the societal values. The internal processes create feedback mobilising and correcting the management process (Fig. 4). At that stage, there was no question of sharing responsibilities at different organisational and managerial levels, although undoubtedly the risk and impossibility of unconditional implementation of top-down incentives was apparent at that stage.

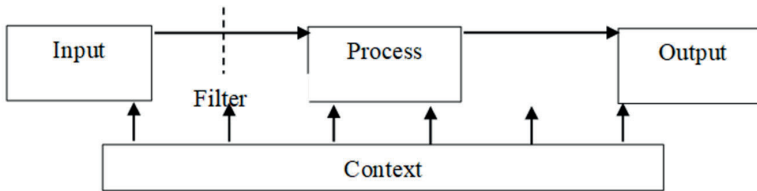


Figure 3. Input-oriented model 3

Source: Own study.

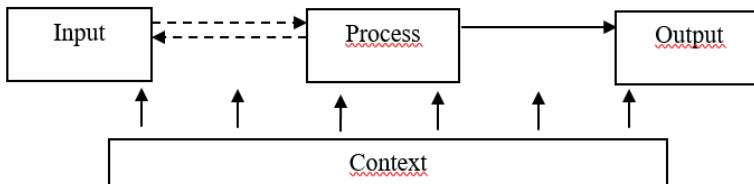


Figure 4. Extended input-oriented model 4

Source: Own study.

In Europe, this model took off on a larger scale in the 1980s, when individual countries started introducing changes to school legislation and a movement towards school autonomy began. It first assumed a form of a limited transfer of responsibility. In the 1990s, the policy of school autonomy gained popularity and was introduced without applying any transition periods or analysing the effectiveness of its implementation. In this approach, prescriptive recommendations were limited, and attention was on the obligation to achieve prescribed goals (Matland, 1995). A degree of flexibility was an important asset at that stage, which made adaptation to local difficulties and contextual factors finally possible. Context seemed to be of key importance and was related to the extent to which power was granted to schools.

Knowledge-based control model

The new focus on output resources in the conduct of educational policies opened a new approach, which resulted in legal and economic changes as well as in changes in the functioning of administration. In the new knowledge-based model, the need for prompt and adequate responses to changes in external conditions and pupils' expectations was channeled onto greater focus on achievements, perceived now as a database subjected to analyses. (Wright et al., 2005), when analysing personnel management processes, noted that the use of higher-quality (empirical-based) procedures led to better performance in companies. Similar dependencies at the level of the organization as a whole were also confirmed by other researchers (Bassi & McMurrer, 2004).

In the knowledge-based model, it is important to shift input control towards enhanced output control (Fig. 5), something that is strongly associated with decentralisation. Inadequate performance in the school system is to be corrected by transferring competences from the state to the school level. Such solutions are sought that would enable schools to better fulfill their tasks and respond more flexibly to pupils' diverse living conditions. Such shift in autonomy justifies or even enforces orientation towards results (products), as well as intensified focus on schools' accountability and efforts to define boundaries between individualisation of particular schools and general expectations from them (Böttcher, 2007, p. 187). At the same time, process con-

trol is associated with more intensive monitoring of results (Fig. 5) through a renewed centralisation, which in turn focuses on the formulation of educational standards and their verification by means of testing. Strategic planning is now to be based on evidence, perceived as a stronger educational policy (Fend, 2011, p. 6). This approach is also rooted in recognising the complexity of policies as well as in attempts to combine top-down with bottom-up strategies, in order to make use of the generated knowledge at the levels of policy making and effective management.

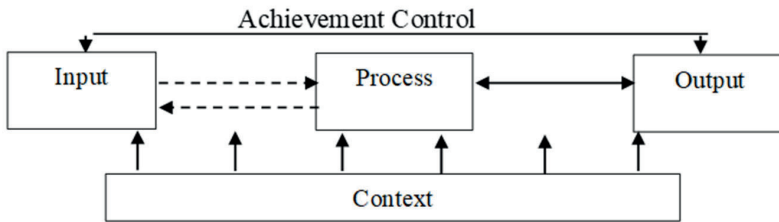


Figure 5. Knowledge-based control model

Source: Own study.

The new order assumes that educational decision-makers will be more effective when they have more and better-structured control knowledge about the education system (Altrichter & Heinrich, 2006, pp. 51–64). Such appropriate database, referred to as control knowledge, is provided by educational research (Altrichter & Heinrich 2006, p. 55). However, there are also many doubts in this model, for example about the recognition of what knowledge should be considered in the supervision. “In the context of research into evidence-based organisational performance, the term evidence refers to the verification or justification of assumptions. In the context of relevant research, it is usually evidence equated with scientific knowledge (van Ackeren et al., 2011, p. 171). In their explanations, Rudolf Tippelt and Jutta Reich-Claassen equate information with indicators, as much as control by means of indicators can be understood as synonymous with control by means of information (Tippelt & Reich-Claassen, 2010). Johannes Bellmann and Thomas Müller describe this perspective as a hyper-technocratic control model which tries to reveal empirical facts from an external perspective (Bellmann & Müller,

2011, p. 10). The purpose of evidence-based educational research is to provide system-relevant control knowledge about educational processes and at the same time to improve the transfer of scientific knowledge between educational policies and practice (Tippelt & Reich-Claasen, 2010, p. 22).

Unfortunately, researchers note that so far hardly any international empirical results have been obtained which would indicate what knowledge is ultimately used by decision-makers in forming administrative and educational policies (Heinrich, 2011, pp. 31–49). Certain conditions are required for transforming information into knowledge which would turn into action. Not all data and information made available to educational actors are relevant for control. Control knowledge is characterised by its usefulness, but must also enable targeted initiatives on behalf of teachers (van Ackeren & Klemm, 2009). Researchers refer to the process of contextualising the achievements of various actors and the related challenges by distinguishing between intentions and effects of control.

Control in social sciences is meant to influence relevant actors in order to incentivise them into an adopted direction. However, “control” does not denote that “its intentions will be 100% implemented as a result of adopted actions, nor that the control procedures will be carried out without side effects” (Altrichter & Heinrich, 2005, p. 126). There is no assumption of automatism, but rather of an attempt to limit the randomness or arbitrariness of subsequent actions. An interesting example is Klaus North’s “stairs of knowledge model,” which illustrates the different steps in the “translation service” (North, 1998, p. 40) distinguishing between information data, knowledge and action as an increasing terminological hierarchy. In this case, just collecting and combining information is not a sufficient condition for gaining knowledge. Different information needs to be assembled and structured in order to arrive at a specific goal (North, 1998, p. 42).

Such a database would correspond to interventions in relation to already recognised challenges. Knowledge contained in an educational report, which is the product of the data collection process, becomes dynamic in a cyclical process (Tegge et al., 2015, p. 41). While the model highlights the process of transformation from well-established knowledge (provided by science) towards relevant planning decisions (initiated by policy makers) through evaluation and discourse, it also leaves open opportunities whereby knowledge

can be transformed into deliberate, concrete (administrative) activities. It does not seem so simple, however, because while research brings new insight into power relations in the policy-making process, there is also a lack of clear answers on how to deal with the identified challenges.

Towards comprehensive models of effective education

The weaknesses of earlier models of effective schools opened a doorway into further analyses in search of new solutions to the unprecedented pace and dynamics of the contemporary world. The search was supported by a strong compulsion to make schools effective for all pupils (Ainscow et al., 2012, pp. 1–17). The notion that factors influencing achievements are fixed and unchanging was rejected, and three key assumptions were made:

1. The features of schools and teachers change over time.
2. The influence of factors may vary depending on how they are measured.
3. Factors may have different effects on different groups of learners.

Dahle Suggett, based on his analysis of Richard Matland in 1995 (pp. 145–174), developed a model in which he distinguished levels of political conflict in relation to achieving political goals or intentions as well as levels of uncertainty in relation to means or actions leading to the achievement of goals (Suggett, 2011). Two-by-two solutions for top-down and bottom-up decision-making can be found in this model (Fig. 6).

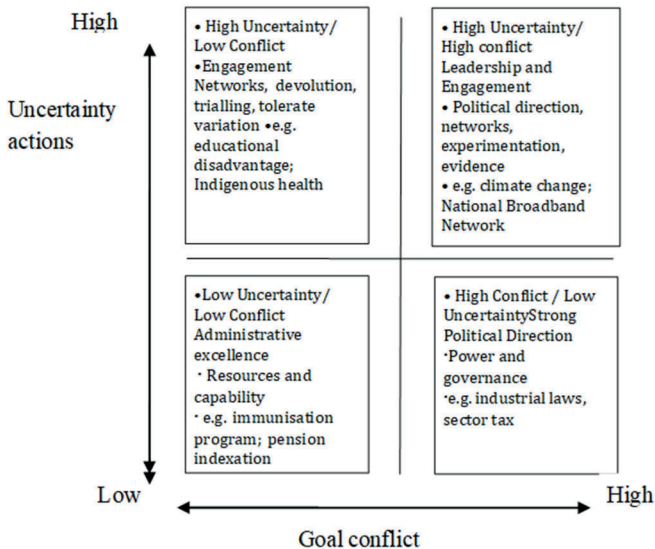


Figure 6. Classifying implementation challenges

Source: Suggett, 2011, p. 7.

The complexity of the environment creates a strong need to make choices about decision-making and their implementation. The Suggetta model demonstrates how top-down and bottom-up approaches can differ. In the developed model, the first dimension (horizontal axis) represents a high or low level of social or political conflict regarding political goals or intentions, the second (vertical axis) takes into account the level of ambiguity or uncertainty as to the measures or actions aimed at achieving a given goal. Although this does not close the discussion on the design and implementation of political interventions, the indicated solutions may constitute a useful starting point for their implementation, i.e as a prerequisite for implementation design.

For example, strategies that use a bottom-up approach (e.g. networks and decentralisation) are more effective in low-conflict areas, but with high uncertainty and disagreement over the means of achieving a given goal (Suggett, 2011, p. 8). In contrast, strategies that use a top-down approach, such as strong political direction and sound management, will perform better in

large conflicts in achieving the goal with relatively high confidence in how to implement it (Suggett, 2011).

Table 1. Managing the differences

Managing the Differences	
High Conflict Outcomes depend on:	High Uncertainty Outcomes depend on:
<ul style="list-style-type: none"> • Administrative excellence • Strong mandate and governance • Resources to achieve outcomes • Capacity to engage opponents • Consistent messages • Sustained political profile • Compliance monitoring • Transparency for winner and losers 	<ul style="list-style-type: none"> • Clarity – owners and outcomes • Local solutions / networks • Tolerance of diversity • Consistency over long timeframe • Knowledge capture/feedback • Regular provider engagement • Capacity to adjust on evidence

Source: Suggett, 2011, p. 9.

The combination of top-down and bottom-up strategies in a process aimed at achieving high-quality education at systemic level is a solution most frequently practiced by developed countries, albeit with varying degrees of effectiveness. An ideal solution would be to use their strengths while limiting their weaknesses. Policy implementation then involves multiple stakeholders working together at different levels. Therefore, both central decision makers and local actors would be important in successful implementation of a change.

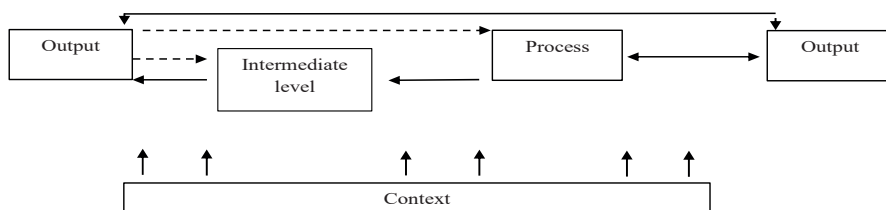


Figure 7. Integrated multi-level model

Source: Own study.

The intermediate level (Fig. 7), referred to as an intermediary layer or middle level in the three-tier model by Michael Fullan (2007), has a key role to play in balancing the tension between centralisation and decentralisation. The authors of the report “How the best school systems get even better” indicate that “continuous improvement of the quality of a system over a long period of time requires integration and creation of connections between its various levels” (Mourshed et al., 2012, p. 91). The “intermediate” level acts as an integrator and mediator, i.e. a kind of buffer between the micro, class unit level and the macro, headquarters level. Its role is to reinforce the coordination of activities and support for schools. An analysis of effective education systems revealed four types of mediating layers: area, team, subject, and level. Despite the differences between them, their functions in maintaining the process of improving the quality of the system are similar and can be reduced to:

- providing schools with targeted support,
- explaining and communicating improvement goals,
- eliminating possible resistance to changes,
- improving the traffic of good practices between schools, facilitating their cooperation, support and joint learning, being conducive to the unification of teaching practices (Mourshed et al., 2012, p. 93).

The adopted assumptions strengthened the approach to the school system as a dynamic system, i.e. full of various connections and conditions, rather than a static system of relations. Education was no longer perceived as an inherently stable system of agreements, and more as a system of influencing factors and achieving variable effects (Creemers & Kyriakides, 2008), composed of various “levels.” The application of the dynamic perspective has brought newer forms of statistical analyses to the research on school effectiveness, allowing for the establishment of direct and indirect relationships between educational factors and pupils’ achievements,¹ which in turn inspired the development of Comprehensive Educational Effectiveness Models. However, empirical evidence obtained by researchers in the changing environment makes it only possible to define a certain comprehensive framework, the fulfillment of which may take place in the process of recognising schools in individual contexts of particular countries.

¹ See popularity of *Structural Equation Modelling* (SEM) as an example.

Summary

The assessment of models oriented towards the achievement of high quality and efficiency of education brings a very mixed picture to light. As a result, neither all-inclusive centralisation nor all-inclusive decentralisation are beneficial. Instead, models which represent a response to their weaknesses and take into account the dynamics of internal and external conditions seem highly convincing, even if they fail to deliver unambiguous solutions. They only point at an array of multiple factors to be treated as a framework in developing own complex models that fit in with native contexts (Creemer et al., 2007; Creemers & Kyriakides, 2012).

Effective management of education systems refers to both the means of ensuring effective planning and the process of implementing and delivering education that provides all pupils with the best possible conditions for high achievement. Therefore, it requires recognition of the multidimensionality of processes on the way to changing the education system and allows to assume that it will not be a simple linear system. It can be assumed that the success of the reform will be determined by its ability to simultaneously meet all conditions, understood as the ability to change and transform education into being highly effective. Andreas Schleicher points to several areas in achieving this goal, which are (Schleicher, 2019, pp. 133–134):

1. Broad support, as in broad public support for reforms (change) of education.
2. Development of the potential understood as guaranteed resources, i.e. the best, up-to-date, professional knowledge and institutional solutions adapted to new tasks and responsibilities.
3. Proper management in the right place as recognition of points where change can take place and be effective.
4. Use of performance data to collect accurate and well-chosen data to monitor various levels of the system.
5. Development of self-regulating systems as feedback, i.e. the effect of mutual interaction between all levels.
6. A *whole-of-government* approach as a joint action of ministries and administrations at various levels in comprehensive reforms.

Knowledge-(data)-oriented political intervention as part of a new management concept requires the most precise database possible in order to describe the state of education systems and provide the necessary information to initiate control activities and strategic planning (Altrichter & Heinrich, 2006, p. 55). Researchers also exhibit great benefits from recruiting large numbers of entities to cooperate at different levels of the education system. In everyday school life, this translates into new solutions practiced in schools, strengthening pupils' learning processes. This affects the whole spectrum of school functioning from the level of teacher-pupil interaction to new school managerial practices.

In the adopted approach, the challenges posed before educational policies can be addressed only in the face of uncertainty, with open systems in operation, in connection with learning by means of new technologies and when preferences of various actors of the educational scene are taken into consideration. Schools need to collaborate with other entities by means of public-private partnerships, pilot projects, public consultations and debates, vision building and network management. Hence, understanding the context, the essence of a given project and its human dimension both at the systemic and school levels becomes crucial in arriving at pupils' high achievements. In the promoted approach of comprehensive change, the role of leadership is emphasised and there is a focus on the direction of research. It advocates "leadership sharing" and distributed leadership strategies, which are better at confronting learning goals with the wider community and working in dialogue. This is a precondition for securing the involvement of other entities in education-oriented activities, i.e. for strengthening its value in everyday life.

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