

## ADAPTIVE MANAGEMENT OF EDUCATIONAL INSTITUTIONS UNDER CONDITIONS OF UNCERTAINTY

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*In the section explores the adaptive nature of managing educational institutions amid the introduction of martial law in Ukraine. It highlights the importance of deliberately utilizing adaptive processes to maintain the socio-pedagogical system and ensure its educational function. Particular attention is given to the full-scale invasion of the Russian Federation into sovereign Ukrainian territory, which has profoundly altered the living conditions of Ukrainians and the structure of organizations and enterprises operating in the country. The necessity of effectively managing educational institutions in an unstable environment has driven the study and development of mechanisms for applying adaptive processes in the management practices of educational stakeholders.*

**Keywords:** adaptive management, development, the Ukrainian education, adaptive processes.

Changes in the economic and political system require people to quickly navigate the environment and their mutually adaptive behaviour. Therefore, the development of adaptive principles of management activities of heads of educational institutions is in demand today.

The disclosure of this problem can help the purposeful formation of adaptive management of social and pedagogical systems. Therefore, an important task of science is to identify and interpret the patterns of adaptive management of education. In this regard, the tasks of the management practice of the educational sphere are to introduce adaptive principles of management of educational institutions and educational institutions for the purposeful development of flexibility and mobility that meets the needs of the time.

From the standpoint of an essential consideration and a targeted approach to the formulation of management patterns, including adaptive management, the research of such domestic and foreign scholars as G.V. Yelnikova (scientific foundations of adaptive management of education [2]), V.I. Maslov, M.O. Kirichenko, V.V. Oliynyk (regularities of scientific management of educational institutions [3]), O.M. Moiseev (quality of school management [4]), V.S. Pikelna (modelling of managerial activity of the head of an educational institution [6]), P.I. Tretyakov, S.M. Mitin, N.M. Boyarintseva (adaptive management of pedagogical systems [7]), T.I. Shamova, T.M. Davydenko (management of the educational process in an adaptive school [8]). Despite some consideration of the above problem, the patterns of adaptive management of educational institutions remain insufficiently studied and developed.

The environment in which educational institutions in Ukraine operate today is characterised by a high degree of uncertainty, which means that they are constantly faced with unexpected external influences. The effectiveness of an educational institution depends to a large extent on how it learns to adapt to such impacts. One of the main tasks of science in the field of adaptation at the moment is to help managers and, above all, to give a clear explanation of adaptation itself and its components, which will allow for more effective adaptation in an educational institution.

Researcher E. V. Chyzhenkova in her work «Formation of the Economic Mechanism of Adaptation of an Economic Entity to the Market Environment» understands the adaptation of economic entities as the process of adapting their parameters to uncertain environmental conditions, which ensures an increase in the efficiency of their functioning throughout the entire life cycle. This definition echoes the definition of dictionaries and is not specific enough for adaptation from an economic point of view [22].

In the work of specialist V. Dudchak «Theoretical and Methodological Aspects of Formation of the System of Adaptive Management of Industrial Enterprises», it is noted that the adaptation of enterprises to changing operating conditions is a type of interaction of an economic entity or a group of entities with the socio-economic environment, during which the requirements and expectations of its participants are coordinated. The author is of the opinion that adaptation is not only an agreement with changes in the socio-economic environment, but also interaction with them, which contributes to the alignment of interests of both parties [15].

Economist M. Budnik in his work «Adaptation of Industrial Enterprises to Market Conditions of Economic Activity» notes that adaptation is the final stage of the process of adaptation of enterprises to the market. The author distinguishes between the process of adaptation and «adaptation», which is the final stage of the adaptation process, i.e. its result [17].

Researcher H. V. Kozachenko understands adaptation as the process of purposeful change of parameters, structure and properties of any object in response to changes occurring both in the external environment of the object's activity and within it. In this definition of adaptation, the author also departed from the general term «adjustment» and showed that the changes to which an enterprise has to adapt can be not only in the external environment, but also within the enterprise itself [34].

Economist S. Kravchenko believes that adaptation is a set of forms and methods of survival of agricultural enterprises in a competitive environment; a subsystem of the economic mechanism of the state that determines the integrity of the formation of economic, intra-economic and market mechanisms of functioning; a component of the state economic policy that provides economic support and economic regulation; a dialectically integral subsystem that harmonises market relations and links [4].

Any organisation needs to effectively adapt to both positive opportunities and threats arising in the environment of its operation. Adaptive measures to the external environment taken by an organisation are directly related to the organisation's strategy. A real strategy consists of 2 parts: well-thought-out, targeted actions and the process of adaptation.

In practice, it is very difficult to separate an organisation's adaptation to its environment from its normal activities. But today, under martial law, the processes and actions that take place in various organisations, including educational institutions, are not stable, they are constantly changing. In response to changes in the external environment, an educational institution improves its activities, which can be carried out both within the framework of its normal functioning and as special anti-crisis measures. In general, the process of adapting to the operating environment consists of the following main stages: monitoring changes in the external environment, identifying key development trends, searching for promising opportunities and choosing actions, implementing selected measures, evaluating the effectiveness of the measures taken and adjusting actions.

The adaptation mechanism consists of the following environmental factors: demographic - changes in birth rates, migration, population ageing, national population structure; scientific and technical - emergence of new technologies, computerisation, information support; environmental - environmental pollution, increased requirements for compliance with environmental protection regulations, changes in the cost of energy and natural resources; socio-cultural - values, traditions, availability of information for the population, level of self-education.

There is a wide range of types and types of adaptation to meet the adaptation objectives. Depending on the task at hand, there are parametric, algorithmic, resource and structural adaptation. Parametric adaptation involves adapting the system to changes by adjusting the parameters (e.g., simulation or neuro-branch approach). Algorithmic adaptation is the transition from one system management algorithm to another, while resource adaptation is aimed at more efficient use of system resources. Structural adaptation means a change in the internal structure of the management system itself; this type of adaptation is divided into alternative (choosing from a small number of alternatives) and evolutionary adaptation (introducing minor variations in the structure).

Depending on the changes in certain groups of environmental factors, there are adaptation to changes in market conditions, adaptation to innovations, adaptation to socio-cultural conditions, and

adaptation to political and legal conditions. Adaptation to changes in market conditions is aimed at changing the services provided by educational institutions, searching for new partners, developing and implementing an effective marketing strategy, and conducting an effective pricing policy.

Adaptation to innovations ensures that the technical level is in line with the achievements of science and technology and forms the basis of the innovation strategy of the educational institution. Adaptation to socio-cultural conditions involves providing assistance in the development of employees' abilities, skills, and qualifications in accordance with the need to ensure the competitiveness of the educational institution in the market. Adaptation to the political and legal environment involves the creation of information systems necessary to track all possible changes in this area, the use of qualified services of political scientists, lawyers, and insurance against the risks of changes in the political and legal environment [12].

Along with the concept of adaptation, there is the concept of adaptive management, i.e. management in a system with incomplete a priori information in a controlled process that changes depending on the accumulation of information and is adopted to improve the quality of the system. Such a definition of the basic concepts of adaptation is due to the fact that knowledge about the object and the environment in which it operates is uncertain. Only their belonging to a certain class and the control goal on which the desired behaviour of the object depends are known. The task is to find a control algorithm that will ensure the achievement of the goal within a finite period of time for any object and its operating conditions that belongs to a certain class.

The origins of adaptive management date back to the emergence and use of managerial influence to regulate human relations. Indeed, the will of the community in primitive society was aimed at equal distribution of the product of labour among community members, regardless of the participation of each of them. Later, the labour method of distribution gradually developed, which can be seen as a manifestation of the adaptive management feature [23].

An important consequence of the development of horizontal layers of governance in feudal society was the ability of vassals to choose a lord to conclude a feudal agreement that ordered the vassal to serve the lord, and the lord had to show patronage to the vassal in return.

The capitalist formation contributed to the accumulation of capital for the maintenance of such social spheres as education, culture, science, etc. It was at this time that the science of management was born, the founder of which is rightly considered to be F. Taylor. He not only developed the scientific principles of management, but also created the basis for the scientific organisation of workers' labour. He was interested in the relationship between the manager and subordinates, which he considered an important factor in increasing profits. Thus, in achieving the economic goal, F. Taylor simultaneously contributed to the development of adaptive management features [34].

An important milestone in the development of adaptive management principles was the achievements of the school of human relations of the American sociologist and psychologist E. Mayo. He proposed to consider any organisation as a certain social system with an integrated social structure.

Thus, E. Mayo identified a new managerial function that concerned the human factor and became known as «human resource management». The development of this school is also associated with the names of Mary Parker Follett (USA, defined management as the performance of work with the help of others, the role of the individual in production efficiency) [9], Douglas McGregor (theory «X» and «Y» - different perceptions of managers about the attitude of performers to work), F. Herzberg (theory of motivational hygiene), R. Likert (theory of organisational model systems), S. Argyris (theory of group learning), A. Maslow (theory of hierarchy of needs) [3], R. Blake, J. Mouton (balance between production and social needs). Scientific research of the school of human relations, which developed against the background of the development of behavioural sciences, created a scientific basis for distinguishing adaptive management as a separate type.

Scholars have different views on the evolution of adaptive management of social systems. Thus, O. Moiseev considers adaptability to be a natural quality of management. Along with adaptability, he identifies such characteristics of management as relevance, value, purposefulness,

activity, preventiveness, predictability, integration, consolidation, motivation, democracy, participatory, humanity, humanity, and personality orientation. According to the scientist, it is possible to model the manifestation of various management characteristics depending on the needs of the organisation [5].

G. Polyakova identifies three periods of formation and development of adaptive management. She associates the first period with the algorithmisation of management in the 70s of the twentieth century, when the adaptability of management was aimed at the processes of adaptation to individual characteristics of the development of students» abilities.

Further development of the principles of adaptive management, according to the author, took place in the 80s and 90s of the last century. During this period, the theory of management was enriched by the knowledge of sociology and psychology about subject-object relations, which makes it possible to study not only management technology, but also the peculiarities of interaction between participants in the educational process.

The author defines the third period of adaptive management development as the period of psychologisation. The specificity of adaptive education systems and their management is the consideration of such processes as motivation, stimulation, social adaptation, interaction, and self-management [7]. Foreign practitioners and scientists (T. Davydenko, N. Kapustin, T. Shamova, E. Yamburg) have developed and are researching an adaptive educational system (AES) that can help each student achieve the optimal level of intellectual development according to natural inclinations and abilities. A school with an adaptive educational system is called an adaptive school [10]. The management of such a school should be adaptive.

Thus, scientists see the need to introduce and develop adaptive management of pedagogical systems to manage an adaptive educational institution. Western scientists also consider changes in the management of organisations from the perspective of adaptability. For example, English researchers T. Burnet and G. Stalker [4] studied the relationship between the organisational structure of an organisation and the rate of change in the environment. They found that at different rates of external change, adequate organisational structures should be used: from bureaucratic to adaptive, including intermediate forms.

Researchers S. Davis and P. Lawrence are convinced that it is impossible to use pure adaptive structures without bureaucratic ones for optimal management of an organisation in a changing environment. They argue that the mobility of connections is ensured not only by adaptive structures, but also by flexible leadership that becomes adaptive. Adaptive leadership is seen as the ability of a manager to choose and combine different management styles depending on the situation. In this case, increasing the adaptability of management is achieved by re-forming creative teams, redesigning tasks or modifying job responsibilities. The Finnish researcher P. Hersey [11] describes 2 types of managerial behaviour: task-centred and anthropocentred, which manifest themselves in different combinations depending on the situation, the manager»s management style and the level of maturity of subordinates. Over time, subordinates develop their own style of behaviour, traditions and a special internal order based on collective requirements and rules. This phenomenon is called organisational (or corporate) culture. Currently, one of the recognised typologies of organisational culture is the classification of K. Handy [13], which describes four types of organisational culture. Among them is the culture of individuality, which is focused on people. In this culture, there is autonomy for everyone, which is ensured by a high level of team maturity. The task of the manager is to help improve the competence of each employee. Recently, the concept of an adaptable organisational culture has emerged in the literature. Such a culture is inherent in the teams of organisations that are in a changing environment. The leaders of such teams care about increasing the level of employees» readiness to innovate and reorient their actions in the face of changes in the organisation»s strategy.

S. B. Alekseev, the author of the work «Adaptive Management of Enterprise Competitiveness», believes that adaptive management is associated with the concept of productivity, although productivity as a criterion for the success of an organisation is justified only when the market

provides additional opportunities for selling products. One cannot but agree with the authors that in the process of adaptive management, a specific response should be developed based on the use of a multivariate model, comparison and selection of the optimal option [4].

The purpose of adaptive management is to diagnose everything that happens inside the system: processes, to investigate processes arising from outside the system, and to plan the future on this basis. The main task of adaptive management is to maintain the internal stability of the system in a constantly changing external environment.

The view of adaptation as an adaptation is the most common and characterises the very essence of adaptation and can be used in any field of science. This meaning of adaptation is used when talking about general issues without delving into the essence of the problem.

The definition of adaptation as a process of purposeful change in the parameters, structure and properties of any object in response to changes occurring both in the external environment of the object's activity and within it is universal, it can be used when changes occur in the external environment and in the organisation itself that affect its activities. The definition has no limitations on the capabilities of the organisation, it is quite specific and reflects the essence of the concept of «adaptation».

Adaptive management is the management of an organisation which allows it to make timely changes to strategic, current and operational plans in order to ensure survival, achievement and constant maintenance of the desired level of competitiveness by using the adaptation mechanism based on constant monitoring of compliance of the actual level of adaptation with the normative one. The considered views on the concept of «adaptation» are fair, and the use of each of them depends on the specific situation [34].

Adaptive management is the process of making a managerial decision and subsequent implementation of a targeted management impact that will ensure an adequate response of all structures of the organisation to changes in the parameters of its external and internal environment.

Describing adaptive management, A.M. Moiseev draws attention to such features as: targeted nature of influence, resonance effect, consideration of the feedback to managerial influences, promotion of co-evolutionary processes - joint combined development of the management system and the managed object [41].

Z.V. Ryabova defines adaptive management of an educational institution as a type of management in which the main goal is to ensure successful adaptation of participants in the educational process to external influences (society, state) and changes in the internal state, both in their own and in the collective. Adaptive management of an educational institution is a type of management whose main goal is to mutually agree on the goals of the educational process for the effective performance of official duties and fulfilment of the mission of the educational institution by creating conditions for the successful adaptation of everyone to the challenges of today [22].

Adaptive management of an educational institution, according to H. Yelnykova, is a process of mutual influence that causes mutual adaptation of the behaviour of actors on a di(poly)logical basis, which is ensured by the joint definition of a realistic goal, followed by a combination of efforts and self-direction of actions to achieve it. The leading features of adaptive management are mutual adaptation and organic combination of the manager's goal and the performer's aspirations based on the development of flexible models of activity [37].

The main factor for the development of such a management system is the balance of interests of all its participants and substructures.

Adaptive management is characterised by its content (functions), organisational structure (direction of mutual influence and procedure for interaction between participants in the management process) and technology (procedure and mechanism of mutual coordination).

The functions of adaptive management are as follows:

- joint development of a realistic goal,
- criterion modelling (qualimetric models of activity),

- co-operation of actions and self-direction,
- self-monitoring of the process and monitoring of the result,
- predictive regulation.

In terms of the direction of mutual influence, adaptive management is both vertical and horizontal, and in terms of the order of interaction, it is both subordinate and distributed.

The technology of adaptive management consists of a procedure, methods, means and ways of its organisation and implementation. The mechanism of mutual coordination reveals the ways of directed influence (self-influence) and simultaneous release of degrees of freedom for self-development of the subjects of activity.

Adaptive management has a linear-functional structure, which is necessarily complemented by organic structures, and is carried out in a programme-targeted form: project management, adaptation-modular, subordination-intermediate partnership, cross-level coherence, etc.

G. Yelnikova argues that adaptive management is a type of situational management. It always reconciles two phenomena that are opposite in nature, and therefore its systematisation can be specified as follows: by the subject of management - combining administrative and participatory (partnership) management; by the nature of influence - combining external management with internal (self-management); by orientation - process-targeted, as it focuses on both the process and the result [37].

Adaptive management has its own laws that underlie its emergence, and the corresponding principles.

The mechanism of adaptive personnel management is monitoring. This is an external or internal vector tracking of the dynamics of the development of subjects of activity (personnel), the activity itself or any organizational structure.

From the analytical study of the existing experience of managing adaptive processes in the conditions of martial law in Ukraine at the levels of «head - deputy - teachers», «teacher - student», «teachers - educational environment», etc. we propose to consider the «triad» of interaction and mutual influence, namely: adaptive processes - the essential basis of adaptation - what is the development of education. Thus, in modern conditions of instability and uncertainty, information flows are diversifying - this can be considered an adaptation process. Then the essence of adaptation is socio-economic transformations in society, since each information flow belongs to a certain economic sphere. There is a diversification of spheres and a reformatting of social groups. The development of education consists in finding analytical mechanisms in the directions of information flows. The process of using Internet resources is activated [25].

With the introduction of martial law in Ukraine, there is a territorial dispersion of students and scientific and pedagogical workers of higher education institutions. The same thing happens when educational institutions are temporarily relocated from occupied territories to places controlled by Ukraine.

The essential basis for adapting to these changes is the introduction of a distance form of education - distance learning. This, in turn, affects the development of distance education through the development of computer programs, Internet resources, programs for independent search and mastery of educational information. The introduction of new computer programs and Internet resources requires additional training of subjects of educational activity. Development is again taking place, only of the professional competence of educators. Conducting classes during an indefinite period of air alert forces the interruption of the educational process [34].

The time for the resumption of education remains unknown. Adaptation processes consist in creating a solid methodological support for the educational subject/discipline, consisting of lecture/lesson texts, recommendations for performing practical work (with texts of practical work) and recommendations for performing independent work (with corresponding texts of independent tasks).

The content of education is developed by isolating and integrating components of the content of education into appropriate modules that reflect the integrity of each topic of the educational discipline/subject according to the modular type. Such modules can be studied independently by

students/pupils, and teachers/teachers can rearrange them depending on the purpose of learning. Therefore, the unstable situation and changes taking place in Ukraine cause adaptation processes that have a certain essential basis and determine the positive development of education and participants in educational activities. Not all changes are constructive, there are also those that are destructive in nature. For To neutralize the consequences of such changes, the administration of institutions should conduct a situational analysis in a timely manner and make management decisions that activate positive changes [11].

The results of positive management of adaptation processes were the fact that Ukraine managed to ensure the continuity of teaching and learning during the post-war period. However, as the President of Ukraine V. Zelensky noted during a meeting with students of the Taras Shevchenko National University of Kyiv, education in Ukraine should be competitive and modern. «It seems to me that the most important thing is that any state wants such a student, wants such a specialist. Knowledge is enough to be free. This is very important: not to look for a job, but to be free so that business or state institutions follow you,» he said [35]. In 2022, teams of Ukrainian schoolchildren under martial law took part in five international student Olympiads: in mathematics (Norway), computer science (Indonesia), physics (Switzerland), chemistry (Slovenia), astronomy and astrophysics (Georgia). We have good results in the performance of Ukrainian students in the international student Olympiads in 2022 - 22 medals (3 gold, 7 silver and 12 bronze). The above facts indicate the expediency, even in the conditions of the challenges of war, of identifying gifted students and continuing the development of education, which today consists in the formation of education 4.0. It should be noted that the military aggression against Ukraine and the introduction of martial law actualized the challenges of war, both the optimization of resources for victory and the prospects reconstruction of the country after the victory. European priorities and development prospects provide for the development of an innovative, high-tech state in Ukraine. This involves the formation of human capital in accordance with the responses to the challenges of the war in combination with transits of adaptation to modern and European development priorities.

Developed countries are focused on education 4.0. That is why its development is relevant for Ukraine. The modern dimension of innovativeness of human capital involves personalization and stimulation of giftedness of education seekers. The prospects for Ukraine's development are now determined both on the battlefield and in readiness through the Marshall Plan for Ukraine to transform it into a high-tech state after victory as a guarantee of ensuring national security, accession to the EU and NATO. An important component of this process is the reorientation of society to an innovative model of development and the ability to realize itself under the conditions of expanding the sphere of influence of artificial intelligence, "digitalization" of all spheres of public life. This requires the formation of advanced education in conditions of constant change and the realization of the need for personalized learning [10].

A high-tech state is impossible without an innovative format of human capital, the contours of which are constantly changing. That is why the state program "Education 4.0. Ukrainian Dawn" [3] has been proposed. Searches in this direction form answers to the challenges of the development of Ukrainian society through the implementation of education 4.0. All these challenges can be divided into groups.

1. Challenges created by the war:

- increasing importance of the national-patriotic, security and media component of education;
- adaptation to military operations and force majeure circumstances;
- maximum integration of education seekers who are internally displaced persons and those who have gone abroad into the educational process;
- readiness of teachers and education seekers to actively engage in reforms of the "education 4.0" format.

2. Challenges of implementing civilizational development priorities:

- the ability to implement a democratic society, a market economy in the dimension of 4.0+ trends, to turn education 4.0 into the main priority of these changes. The study of the issues of education 4.0 by the World Economic Forum, which has been publishing analytical reports on this issue for the second year, is very important [4, 5];

- accelerating the development of a modern digital society in accordance with modern standards and reform practices in the EU and developed democratic states; - finding its place in the EU development programs for 2021-2027. In accordance with the tasks of developing education 4.0. The European Commission has identified the following areas of development of education and training by 2025: «60% of recent graduates of vocational education should benefit from on-the-job training during vocational education and training and 47% of adults aged 25-64 should participate in training during the last 12 months» [9]. In this trend, very important indicators of success are the New Generation program [8] and the European Year of Skills [9].

3. Challenges that reflect the inconsistency of transformational changes in Ukraine since independence. 4. Challenges associated with the victory and implementation of the Marshall Plan for Ukraine. It is Education 4.0 (not at the level of slogans, but at the level of a roadmap) that is the main priority for building society and human capital as a high-tech state. Conclusions and further research. Thus, we conclude that [11]:

1. The use of adaptive management of educational institutions, which is based on directed self-organization, gives positive results in the conditions of martial law in Ukraine for making targeted and operational decisions and provides the possibility of organizing and implementing the educational process.

2. Despite the great losses in the educational sphere, participants in the educational process have proven the ability not only to master new knowledge, but also to carry out their own development and contribute to the development of education in Ukraine.

3. The experience of online education and blended education, which is developing under martial law, proves the need to isolate and create information banks of adaptive processes for their conscious use in typical cases of uncertainty of situations.

4. The task of post-war restoration of Ukrainian education should be directed towards the formation of a roadmap for the implementation of Education 4.0 in Ukraine, implementing the following positions:

- Studying the mechanisms for forming European competence frameworks and supplementing them with appropriate skills development programs to accelerate the solution of these tasks in Ukraine. One example. In 2017, the EU defined the Digital Competence Framework for Teachers (DigCompEdu). And in 2021-2027. The Digital Europe Programme and repealing Decision (EU) [6] is already being implemented, which structures the formation of these competencies in 22 areas.

- Integration of Ukrainian education into real programs for the development of «education 4.0» in the EU and leading democratic countries that support Ukraine. At the same time, it is important to pay special attention to modern forms of work with gifted children. We propose to consider this problem through the development of STEAM education. For the effective implementation of this activity, it is advisable to combine our own developments with those accumulated in English-speaking countries. Perhaps we should start with what STEAM laboratories in schools are doing [10]
- the range of projects, integration into the media space.

Based on the above provisions, the laws of adaptive management were determined and formulated as follows [32]:

1. The law of activation of natural mechanisms of development of the managed system. Management is always productive if the managerial influence is directed at the natural path of development (of a person, organization, etc.). The natural development of social systems is associated with the conscious activity of people, their ability to perceive any information, to comprehend their situation, to compare themselves with others, to analyze the requirements of the current situation, etc.



In this case, a state of dissatisfaction may arise, which activates the search for ways out of this state. There is a rethinking of disagreements that arise as a result of communication with other people or active assimilation of norms of behavior, values of the team, other means of activity, etc. If a person recognizes the cause of the disagreement as external circumstances, he removes responsibility for unsuccessful self-realization and overcomes the internal conflict in a defensive way through self-justification. If a person recognizes the cause of inconsistency as his own imperfection, he takes responsibility for the effectiveness of self-realization and tries to remove the internal conflict by taking active action regarding his own development. Such development is called reflexive, and in the conditions of adaptive management it is ensured by involving performers in the development of models of his own activity, its self-analysis, current and prospective self-regulation and design. Thus, the activation of the natural path of development of the managed subsystem is due to the correspondence of the content, means and technology of management to the task of restoring balance between its internal and external connections on a reflexive basis.

2. The regularity of coherent convergence of processes of different origin based on dialogical adaptation of the interacting parties. Modern conditions orient the development of the general secondary education system towards a more complete satisfaction of the educational needs of citizens within the framework of state and social requirements, which requires a certain flexibility and adaptation to the needs of society and the requests of the individual, as well as the actualization of natural processes of self-development. The implementation of these tasks is facilitated by the coordination of multidirectional influences on the managed subsystem. Management activities require constant coordination of the defined goal and the conditions for its implementation in each specific situation; the requirements of the manager and the expectations of subordinates; the hierarchical nature of management and the development of partnership relations; state and social requirements for the activities of the school and the individual interests of students, teachers, parents, etc. The very concept of coherence means bringing managed processes into line with each other to achieve unity of action [3]. In social systems, to which the general secondary education system belongs, this is a process of discussion to develop unity of thoughts, views, the basis of action, etc. Typically, the discussion process is carried out in the form of a dialogue, when several people take part in the conversation. The result of the dialogue is the elimination of disputes or conflicts by discussing arguments, exchanging opinions with the development of a common position [1]. Thus, there is mutual adaptation of different points of view and the establishment of coherent connections between them, which contributes to the optimal approximation or combination of efforts of the interacting parties in achieving a common goal.

Management in an adaptive system allows for the free expression of different opinions, which are taken into account when formulating a realistic goal and the corresponding management decision. Adaptive management always takes place in an unstable situation and uncertain conditions, which does not allow for one-person management, makes it ineffective, and requires interactive methods of making management decisions based on dia(poly)logy. This gives grounds for asserting that the effectiveness of adaptive management depends on the establishment of communicative links between the managed and managing subsystems based on dialogue and the degree of coordination of their actions with the awareness of unity in achieving a jointly defined goal.

3. The regularity of the dependence of the adaptive nature of management on the realism of its goal. Awareness and ensuring the realism of the goal occurs only on the basis of analysis and coordination of a person's (or organization's) own directions with the requirements of society and the state for it, and taking into account the real situation that is developing. Coordination of goals determines the direction of further development of the system (for example, general secondary education), adapts the existence of a person (or organization) to real conditions, while maintaining the achieved level of development. The realism of the goal is achieved by adapting the ideal goal to the features, capabilities and interests of the managed subsystem, taking into account specific circumstances. For example, the regional education department sets the ideal goal of automating and

coordinating the management activities of school leaders in a certain district based on the use of computer technology. A study of the real state of affairs shows that with a sufficient number of computers connected by a communication network, only 30% of schools have the appropriate software, and 50% of leaders own a computer. The current situation confirms that the goal set is currently unrealistic, but it can be achieved if all schools in the district are equipped with the appropriate software and the remaining heads are trained to use computers in school management. The ideal goal under the current conditions can be achieved only by 30%, which is a realistic goal. Thus, in reality, in the current situation, automation and coordination of the management activities of school heads in the district can be achieved only partially, by 30%. The district education department adapts the order of the higher management body to local conditions, issuing orders only to heads of those schools that have the appropriate computer programs. To fully implement the order, a decision is made to conduct appropriate in-service courses for heads who do not own a computer and to find resources to equip the remaining schools with software materials. Finding extrabudgetary funds may also be an ideal goal, which can be achieved in the same way through intermediate realistic goals. Defining a realistic goal that can be realistically achieved under the existing conditions and adapting management decisions to these conditions ensures gradual progressive changes in the development of the managed system towards the ideal goal. Therefore, the adaptive nature of management depends on ensuring the realism of its goal.

4. The regularity of mutual adaptation of the managing and managed subsystems is manifested in the fact that the management subsystem (regional, city education department, district education department, school administration, public), when making management decisions, takes into account the features, capabilities and real direction of the activity of the managed subsystem (district (city) educational institution, general secondary education institutions, students, teachers, parents), ensuring the realism of the tasks set. At the same time, the managed subsystem, perceiving the tasks, orients its activities towards their implementation, adapting individual interests to the state and social interests that are «embedded» in the tasks. If necessary, the functions of managers and subordinates are combined both to ensure the realism of the tasks set and to achieve a common goal. For example, requirements for the activities of educational institutions and institutions, school administration, students, teachers are jointly determined, or mutual adjustment of target functions is carried out to perform a certain task. At the same time, a directly proportional relationship is established between the optimality of the interaction of the controlling and controlled subsystems and their functional mutual correspondence, which ensures the effectiveness of the development of the general secondary education system.

5. The regularity of the optimal ratio of the directing influences of the controlling and conscious self-direction of the controlled subsystems. Development is always ensured by the coordination of the interaction of multidirectional influences, which are the driving force and have a forming, destructive basis or are represented by differently combined ratios of these bases.

6. If these influences are spontaneous, the movement of the system is chaotic, causing free development. If the influences are ordered, the movement of the system is directed in a certain direction, which ensures directed development. If the ordering is carried out from the outside, administrative management takes place, the result of which is a programmed forced development. If the ordering is carried out by the system itself (a person, an organization), self-management takes place, the result of which is directed self-development, consciously programmed, agreed with all interested parties.

7. Therefore, the sustainability of development is ensured by the mutual correspondence of the directing influences of the controlling and conscious self-direction of the controlled subsystems.

8. The regularity of monitoring support of the interaction of the controlling and controlled subsystems and their reflexive development. The progressive development of the system is characterized by an upward path, which ensures the transition of the system from a lower level to a higher level of organization. At the same time, the development of the system in the horizontal layer

of any level is possible until the system masters all the free space. After that, the system needs to move to a higher level in order to continue its development. The transition of the system to a higher level changes its qualitative state, and the continuation of development in a new horizon changes its quantitative state. This is a progressive path of development. If under any conditions the ascending path in the system stops, its forming forces turn into destructive ones (the system destroys itself). The regression of the system begins [27].

Therefore, a holistic process of directed self-organization requires accompanying analysis and evaluation to predict the paths of further development, which prevents the transition of a formative force into a destructive one. This is done through monitoring procedures, in education - through educational monitoring, the tools of which are basic qualimetric submodels of the activities of the participants of the organization and the implementation of the education process (including general secondary). Monitoring helps to receive timely information about changes in performance indicators, on the basis of which current adjustment (or self-adjustment) is carried out to direct the development of participants in the educational process and the system of general secondary education as a whole and in the desired direction. At the same time, external analysis of indicators and self-analysis have different results. In the first case, this is external managerial influence, in the second - reflexive development. The latter is more effective. However, to determine the model of a generalized (virtual) student, teacher, manager, school, district (city) educational institution, showing the trend of their development, external analysis is necessary [40].

Therefore, it is advisable to cooperate the actions of the controlling and controlled subsystems in the implementation of educational monitoring. Awareness of oneself among others always causes the effect of competition and activates reflective development, which is important for both the controlled and the controlling subsystems. Thus, reflective development is directly dependent on the appearance of a state of inconsistency between the results of monitoring and the level of aspirations of the participants in the educational process. Therefore, it can be argued that monitoring (self-monitoring) of activity stimulates reflective development.

7. The regularity of the interdependence of current adjustment and prospective regulation of the activities of the management object (current process regulation and prospective regulation of the result) The implementation of agreed goals on the basis of self-management (directed self-influence) is a directed self-organization and ensures directed self-development.

This is nothing more than a conscious, purposeful activity of a person (or organization), the initiator of which is the person (organization) himself. This is the organization of oneself for a specific activity (the process of ordering). Such activity necessarily leads to the desired result (achieving the goal). Directed self-development is ensured, on the one hand, by the current adjustment of one's own activities on the basis of self-monitoring of the process, and, on the other hand, by prospective regulation of further development on the basis of monitoring the result. At the same time, the subject of activity tries not to highlight shortcomings, but to determine unused reserves, which he takes into account when designing his subsequent actions. This approach allows to strengthen the democratic nature of management and expresses the interdependence of current adjustment and prospective regulation of the activities of the management object. The following are necessary conditions: providing more degrees of freedom to performers to implement their own initiatives; supporting their self-organization and self-development through self-education; stimulating creative activity and introducing innovative technologies, etc [34].

9. The regularity of strengthening the subjectivity of relations, partnerships and the naturalness of the development of the object when implementing targeted influences of the management subsystem. This regularity is expressed in the fact that the central place in management activity is given to a person, his development, and the creation of conditions for his self-realization. A person is recognized as the highest value of society, and therefore, already when studying in a general educational institution, attention is paid to the development of the child's subjectivity, his active participation in solving educational tasks. The organization of the educational process in

modern conditions requires a departure from reproductive learning and an orientation towards interactive forms and methods of acquiring knowledge. Relationships in the systems: "teacher - student"; "manager - teacher"; "civil servant - school principal" should gradually transform from purely subordinate to subordinate-partner relationships. This will contribute to strengthening subject-subject relationships, mitigating external directed influences on the activities of the managed subsystem by motivating employees and students, as well as creating conditions for their independent harmonious development without coercion and administration.

10. The regularity of the dependence of the effectiveness of adaptive management on the full use of its scientific principles. This regularity is due to the fact that adaptive management arises and is used when the system is destabilized due to its transition to a qualitatively new state and requires appropriate regulation by restoring equilibrium with the environment. In such situations, as a rule, uncertainty prevails, therefore the implementation of current management tasks is not provided by standardized and technological procedures and requires collective thinking. At the same time, a lot of time is spent on solving everyday issues, and development occurs on a case-by-case basis, but requires determining its strategic line. Operational decisions that «serve» the strategic goal gain importance. This goal is aimed at maintaining the balance of the system with the external environment by exchanging information and bringing the system into line with changes in the environment, which makes it open.

11. Adaptive management ensures the coordination of actions of the components of the managed system by means of operational restructuring of connections in conditions of environmental variability to achieve a jointly determined result. The restructuring is carried out on the basis of current monitoring data, which ensures the desired direction of educational processes. Therefore, the full use of the scientific principles of adaptive management is of great importance, namely: recognition of the priority of human development in modern society; combination of systemic, anthroposocial and qualimetric approaches in organizing the adaptive management system of general secondary education; achievement of the goal by defining and implementing a chain of realistic goals; increasing the criteriality and purposefulness of management in the joint development and implementation of factor-criteria models of the activities of participants in the general educational process, institutions and institutions of general secondary education on a qualimetric basis; combination of efforts and cooperation of actions of the managing and managed subsystems at all levels of the organization of general secondary education; conducting educational monitoring and prospective regulation of one's own activities. Leading in the implementation of adaptive management are the concepts of directed self-organization, educational monitoring, and reflective human development [31].

12. Therefore, the completeness of the use of the scientific principles of adaptive management has a direct impact on its effectiveness.

13. The regularity of the action of the «information pulsar» (the term «information pulsar» with direct and feedback was borrowed in the dissertation research of Pikelna V.S. Modeling the structure of relationships in the school as a social system, the scientist identifies connections-relationships that serve as an «information pulsar», implementing direct and feedback [4]) with direct and feedback, which reflects the structure of relationships and ensures the current mutual correction of the activities of the managing and managed subsystems. This regularity consists in the current double adjustment of the activity plans of both managers and performers during the passage of multidirectional exciting information flows. Active influence is exerted by upstream and downstream information. Upstream information is of a social nature. It consists of the results of conversations, surveys, questionnaires of students, teachers, managers, the public, containing empirical material, claims, wishes and generalized data of educational monitoring, etc. This is the feedback that the manager should receive and which highlights the social mood of the managed subsystem and its environment, in addition, it shows the trends of changes in the development of implemented innovations, in the mood and priority areas of action of people that may occur in the future. Analysis of upstream information gives an idea of the real vector of

people's activity, which is of great importance for the development and adoption of management decisions and ensuring their realism [14].

Therefore, processing the upstream information, the manager makes the appropriate current adjustment of his own operational and tactical activities, which is taken into account in daily, weekly and monthly plans to ensure a positive result of management decisions and, in the case of registered deviations, for the current regulation of the team's activities. After that, the upstream information continues its journey, reaching first the district education department, and then the regional education and science department. At each level, the current adjustment of the activities of the governing bodies and executors is also carried out.

At the same time, downward information of a normative nature moves from above. At each management level: regional education and science department - district (city) education department (department) - general education institution, normative information is adapted to local conditions, taking into account social information. The coordinated information continues its way downward, and at each management level the activities of managers and executors are again regulated, but changes are made not only to work plans, but also the strategic line is clarified, which gives it a more reliable, realistic character.

Thus, the «pulsating» action of information flows connects all levels and sublevels of the system. Direct and feedback in one step of the «pulse» allows for mutual adaptation of the activities of the managed and managing subsystems, timely introduction of appropriate adjustments, creating conditions for the implementation of promising and at the same time inhibiting the development of undesirable trends.

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