

HPEPA 2019**Humanistic Practice in Education in a Postmodern Age 2019****DEVELOPMENT OF STRATEGIC AND SISTEM THINKING**

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Abstract

The article deals with the problem of developing systemic and strategic thinking in the process of solving problems. An analysis of the scientific literature on the research topic is presented, and the main approaches to determining the characteristics of thinking are considered. The following provisions are updated. Strategic thinking is a complex, multi-faceted process of forming a specific action plan, which includes various components: the development of mental operations, a creative, project-based approach to situations, the ability to highlight details and see the whole picture, to predict the possible outcomes of events. Systems thinking is a specific type of thinking that allows you to see the integrity of the surrounding world, the relationship and interdependence between various elements, as well as the ability to change, create and model systems. This kind of thinking allows you to make decisions most quickly and efficiently, analyze and solve the tasks, increases the ability to adaptability and learning. The condition for the manifestation and development of strategic and systemic thinking is the process of joint problem solving, in which the assimilation of knowledge and skills is possible. The level of development of strategic and systemic thinking directly depends on the respondent's ability to search for variable approaches, hypotheses using initial data, rebuilding from different positions, high mobility in changing operations involved in the thinking process. We present the results of a theoretical and empirical study of the development's characteristics of strategic thinking in the process of solving problems among respondents of adolescence.

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1. Introduction

In modern conditions, it is increasingly necessary for a person to perceive changes in the external environment and transform this understanding into concrete strategic actions. This is due to a significant increase in the flow of information from various sources, the emergence of new professions (in the fields of science, business, information technology and others) and the presentation of new requirements for specialists in various fields.

The process of purposeful activity is directly related to the construction of strategies aimed at the achievement of the final result, for the success of which the person must possess strategic thinking.

Modern realities require an individual to be able to set specific goals, predict the future, weigh risks and opportunities, determine an action plan, allocate available resources to achieve the goals, while acting in an environment of competition and cooperation. These skills form the basis of strategic thinking.

Today, a person is increasingly in situations of multitasking in the aggregate with a lack of time, therefore, trying to solve a large number of tasks, delve into their essence, breaks down the problem into many details, studies them and loses sight of the whole picture. For the qualitative solution of problems it is often necessary to see the whole and the interrelation of its elements, and then the systematic thinking becomes the main quality of a person's success. A sensitive period for its formation is adolescence; it is then that the theoretical and abstract forms of thought become the leading types of thinking. After analyzing the features of strategic and systemic thinking of adolescence, we came to the conclusion that it develops mainly in the process of solving problems.

2. Problem Statement

Based on the theoretical analysis of scientific literature and modern trends in the development of society, we came to the following contradiction: with insufficient knowledge of the characteristics of the development of strategic and systemic thinking, the society feels the need for individuals with a high level of development of higher cognitive processes and social functions; within the framework of existing approaches to the understanding of strategic and systemic thinking, no single method has been identified that can reflect its resource components, which are manifested in the process of human mental activity, as well as develop from adolescence.

Thus, at the moment in the scientific community there is the problem of studying and assessing the characteristics of the development of these types of thinking.

3. Research Questions

The object of the research is strategic and systemic thinking. We assume that these kinds of thinking develop in the process of solving problems in joint activities, namely, in an environment of competition and cooperation. Thus, the subject of our research is highlighted - the process of solving problems in joint activities as a factor in the development of systemic and strategic thinking.

4. Purpose of the Study

The purpose of our study, we identified the study of the development of strategic and systemic thinking in the process of solving problems in joint activities. As well as the identification of features of the manifestation of strategic and systemic thinking to the process of solving problems in joint activities.

5. Research Methods

To achieve the goal of our research, we used the methods of theoretical analysis of scientific literature as a methodological basis (Dubrovina, Lyamina, & Moiseyeva, 2017). We have formed a package of diagnostic methods that allow us to test our hypothesis that strategic and systemic thinking develops in the process of solving problems during joint activities.

Psychological test "Resilience", developed by Leontyev and Rasskazova (2006), it will allow to determine: "control", since this characteristic reflects an indicator of the subject's ability to influence the result with the help of competition in the process of joint problem solving; "Involvement", as it shows the subject's openness to interaction and cooperation in the joint decision process (p. 15). To identify "dedication", "perseverance" we used the questionnaire "Self-organization of activity" by Mandrikovoy (OSD) (Mandrikova, 2010, p. 87).

Questionnaire "Psychological readiness for innovation activity" Krasnorytseva (2012) will provide an opportunity to check the component of the same name, as well as the ability to think systematically (p. 152). To study the flexibility of thinking, we took the method of I.M. Lushinoy (as cited in O'Conor, 2018, p. 34), since this component is the basis of both strategic and systemic thinking. In addition, we need to test strategic thinking through the process of solving problems, here we use the author's game case with questionnaire elements.

As a method of mathematical data processing, we use descriptive statistics, Spearman's rank correlation coefficient, which will reveal the strength and direction of the correlation relationship between the level of development of strategic thinking and resource, predispositional components of the strategic potential, and of course, methods for qualitative analysis of the empirical data.

6. Findings

We conducted a theoretical analysis of the problem and came to the following conclusions. Strategic thinking is appropriate to consider from two perspectives. On the one hand, as the ability of an individual to choose the most effective strategic decisions, taking into account all sorts of factors, applying an analytical and creative approach. On the other hand, it is like a strategic decision-making process leading to a set result (Konstantinov, 2015).

We assumed that the basis of this cognitive process consists of such indicators as flexibility of thinking, strategic goal-setting and planning, the ability of the subject to streamline their activities, initiative, willingness to change and the ability of the subject to operate in changing conditions, choosing the most effective strategies.

According to the activity approach will characterize strategic thinking as an active, directed mental-activity process, going from thought to word and back, expressed in a concrete, external, objective activity,

which in turn runs in parallel in the form of objective actions performed in the mind. The whole described complex process proceeds with the aim of building a strategic action plan.

Regarding the concept of "strategic thinking" it is necessary to highlight the study of the domestic scientist B.G. Teplova, who made a retrospective analysis of the features of the mental activities of great commanders, in particular, the style of strategic decision-making, and also highlighted important personal characteristics, without which this approach in achieving goals is impossible. For a more complete picture of the nature of strategic thinking in the framework of our research, it is necessary to consider the article B.M. Teplova about the mind of the commander (as cited in Dzukaeva, 2016, p. 26).

Due to the fact that B.M. Teplov was engaged in the development of a concept of a practical mind, different from the theoretical one, he considers the mind of the commander as a separate type of thinking closely related to the will, identifies specific features and specific characteristics of the minds of commanders-strategists, comparing to some extent the personality of the commander with character traits. B.M. Teplov, at the beginning of his analysis, turns to theoretical activity and, in this connection, identifies concrete and abstract minds, quoting a foreign author, P. Duhem, who attempted 32 delineating two types of minds using the example of great physicists.

Physicists who have a specific mind, according to P. Duhem, have the ability to represent the whole in their imagination, grasp individual objects, details, analyze and perceive the relative relationships that exist in this complex whole. For other physicists, it is typical to imagine a large number of objects in imagination, to highlight all complex and diverse connections as a whole, to single out the main idea, not focusing on the smallest details, that is, thereby saving "intellectual economy", reducing to the conclusion all facts and laws. Based on this, B.M. Teplov concludes that the commander's mind is the mind of both the "genius of the whole" and the "genius of details" (as cited in Kislyakov, 2012, p. 12).

At the heart of the solution of any task before the commander is an analysis of the situation, with the goal of foresight, further planning and building strategies and tactics of action. Information about the situation is always complex, versatile and diverse, therefore the distinctive features of talented commanders is their ability to analyze enormously complex material, draw conclusions from it, synthesize this data and build simple, clear, definite plans, decisions, combinations. In simple terms, the strategic thinking of the generals lies in the ability to transform the complex into the simple. Thus, we again note the combination of two opposites in this complex form of mental activity (concreteness - abstractness, analysis - synthesis). Conducting an analogy, important for our research, between strategic thinking and the commander's mind, which is written by B.M. Heat in his study, we note that this particular type of thinking is characterized by flexibility and freedom of mind, as well as the power of imagination, combinatorial abilities, creative energy, the ability to cover all aspects of the issue at once, quickly analyze material of extreme complexity, systematize it, highlight the essential, outline an action plan and, if necessary, instantly changing it - all this, to everything else, even for the most talented person is impossible without very solid intellectual preparation.

The following, most important for our research, mention of this phenomenon is found among American scientists –Neilbuff and Dixit (2015), who, within the framework of management psychology, considered strategic thinking in game theory as applied to business and everyday life, illustrating their principles with multiple examples (p. 29). Also worth noting are the works of the following scientists who

dealt with the problem of strategic thinking within the framework of management psychology: G. Mintzberg defined strategic thinking as a distinctive feature of the manager, K. Omae - strategic thinking as the ability to think creatively and actively, M. Lindgren and H. Bandhold identified several principles of strategic thinking. Thus, after conducting a theoretical analysis of the scientific literature, we note that the first conscious attempts to isolate strategic thinking in psychology belong to the second half of the 20th century. In his work on the development of thinking skills, the Anglo-American scientist E. De Bono defines strategic thinking as the choice of the most appropriate steps from a variety of possible, as well as the development of a plan for successful behavior in a given situation (as cited in Neillbuff & Dixit, 2015, pp. 30-42).

In modern science, strategic thinking is understood as a combination of personal or organizational skills, consisting in the ability to effectively manage the flow of strategic decisions, possessing intellectual flexibility, the ability to think creatively and actively, to generate dynamic ideas and goals based on the prediction of the future.

In the process of building plans and choosing the most advantageous strategies we face a huge variety of plexuses and factors, we try to simplify the available information and subject it to linear logic, reduced to cause-and-effect relationships. Such a strategy is often unprofitable, since we miss a lot of elements in the task and do not see their interconnections. For the most successful problem solving, a person must also have a systemic mindset. It is impossible to build a strategy, relying only on superficial facts and ignoring the systemic structure of the world.

Researchers Joseph O'Connor and Ian McDermott understand systemic thinking as a way of thinking that focuses on the relationship of elements whose interaction forms a system - a single whole. And under the system is an entity that has a definite goal and, in the course of its own vital activity, functions as a whole. There are open and closed systems. Their difference is that an open system consuming external resources interacts with the outside world, and a closed system is content with internal resources and protected from external influence (as cited in O'Connor, 2018, p. 68).

In the course of a theoretical study of the development of strategic thinking in adolescence, we came to the conclusion that thinking at this age is characterized by flexibility, ability to abstract, creativity. It was during this period that the development of more complex strategies for various types of problem solving, the improvement of metacompetence, including planning, and self-organization. Also, in adolescence, there is a need to increase the flexibility of thinking for the selection of methods from an extended base of scenarios. These features and characterize strategic thinking. This means that adolescence is the most sensitive for its development. It should be borne in mind that this type of thinking is specific and is formed in certain conditions.

The author of the book "The ABC of Systems Thinking" Medouz (2018) defines the system as a set of elements connected and interacting with each other, having a specific goal. The opposite of the system is a set of elements unrelated and not having a common goal. The system is characterized by the pursuit of a specific goal, the ability to adapt to external conditions, the residence of certain life cycles and dynamism. In turn, systemic thinking is defined by this researcher as an approach that allows understanding the components of the system and tracing the relationships between them, predicting the behavior of systems and modeling the structure.

The essence of systemic thinking is a special approach to understanding the meanings and patterns in the occurring phenomena, the ability to define systems, the ability to see the relationships and interdependencies of the elements inside these systems.

One of the conditions for the formation of strategic and systemic thinking, in our opinion, is the process of solving problems in joint activities. With the process of solving problems, all mental activity is connected, including thinking. (Dzukaeva, 2016), which is characterized by the possibility of generating fundamentally new solution strategies.

Problem solving is an active learning method that allows all participants in the educational process to engage in interpersonal interaction and build relationships of cooperation and competition, which contributes to practical preparation for overcoming individual difficulties (Kislyakov, 2012). In a joint activity, participants in the process are immersed in the activity and independently make decisions. So they get the opportunity to develop strategic thinking through the realization of their creative potential, the development of flexibility of thinking, perseverance and determination.

We conducted an empirical study on the basis of the Art-Business Student Innovation Business Incubator at BSPU. M. Aknulla, which was attended by 52 respondents aged from 19 to 23, since it is youthful age that is the most sensitive for the development of strategic and systemic thinking.

In the process of empirical research, we obtained the following results.

According to the method of descriptive statistics of the obtained data, we obtained the following results during the solution of the author's game case with the elements of a survey for the study of strategic thinking: 37 people (71% of the sample) completely solved the game case, 15 people did not cope with the case (29% of the sample). In total, for solving a game problem with answers to open questions that reveal the level of development of strategic thinking, you can score 30 points.

On the “control” scale, a low level of the indicator was found in 8% of respondents, in 72% - medium and in 20% - high. This suggests that in adolescence the indicator of the subject's ability to influence the result through competition in the process of joint problem solving is at an average level and has the potential for development.

On the “involvement” scale, a low level was detected in 38% of respondents, in 50% - medium and in 12% - high. Consequently, in adolescence, the indicator of the subject's openness to interaction and cooperation is also at the average level of development, but the low indicators are somewhat higher compared to the “control” scale. From this we can conclude that the competitive environment prevails over the environment of cooperation in adolescence.

For convenience, we reflect the data obtained in the Table 01.

Table 01. Results of diagnostics according to the “Resilience” method C. Muddy

| | Low level, % | Middle level, % | High level, % |
|-------------|--------------|-----------------|---------------|
| Control | 8 | 72 | 20 |
| Involvement | 38 | 50 | 12 |

According to the methodology “Self-organization of activities” Mandrikova (2010) obtained the following level results on the scales: “purposefulness” in 24% of respondents showed a low level of the indicator, in 48% - medium and in 26% - high; “Perseverance” is low in 18% of respondents, in 48% medium and in 34% high.

Based on the above results, we concluded the following; firstly, a person in adolescence is fully aware of his own goals and is fully capable of achieving them, but it is important to understand that not all activities at this age are aimed at achieving these goals, and secondly, it is capable of being organized and structured in actions, willpower, but at the same time, is inclined not to bring to the end, to switch its attention to other tasks. Indicators we presented in Table 02.

Table 02. Diagnostic results by the method of “Self-organization of activity” E.B. Mandrikov

| | Low level, % | Middle level, % | High level, % |
|----------------|--------------|-----------------|---------------|
| Purposefulness | 24 | 48 | 26 |
| Visibility | 18 | 48 | 34 |

In the method of "Psychological readiness for innovation" Krasnorytseva O.M. We were interested in the Krasnadoritseva General Index of Psychological Preparedness for Innovation. In the process of diagnostic research, we obtained the following results: 12% of respondents showed a low level of innovation, 78% had an average level and 10% had a high level.

According to the obtained result, we can assert that the overwhelming majority of respondents have prevailing initiative, willingness to change and the subject's ability to act in changing conditions, choosing the most effective strategies (Table 03).

Table 03. Diagnostic results by the method “Psychological readiness for innovation activity” O.M.

Krasnorytseva

| | Low level, % | Middle level, % | High level, % |
|------------|--------------|-----------------|---------------|
| Innovation | 12 | 78 | 10 |

According to the method "Study of the flexibility of thinking" - these levels of indicators: 11-20 - low level, 21-25 – medium, from 26 - high level of flexibility of thinking.

Having conducted the study, we obtained the following results: 52% of respondents showed a low level of flexibility of thinking, 24% had medium and 24% had high, which indicates insufficient development of flexibility of thinking in adolescence and the need to develop this indicator (Table 4).

Table 04. The results of diagnostics according to the method "Investigation of the flexibility of thinking"

| | Low level, % | Middle level, % | High level, % |
|-------------------------|--------------|-----------------|---------------|
| Flexibility of thinking | 52 | 24 | 24 |

In support of our hypothesis, we assessed the relationship between the indicators obtained as a result of the implementation of the diagnostic complex and the adolescent respondents using the Spearman rs correlation analysis.

For the study of strategic and systemic thinking, we used the following scales - “dedication”, “perseverance”, “psychological readiness for innovative activity” “flexibility of thinking”. We consider the process of solving problems in joint activities as an active method of learning, which allows all participants in the educational process to engage in interpersonal interaction and build relationships of cooperation and competition, then we used the indicators of “control” and “engagement” to study the problem solving process in joint activities.

After assessing the relationship of indicators, we found that the level of control affects the level of determination (with $p = 0.604$), perseverance (with $p = 0.689$), innovation (with $p = 0.423$), flexibility of thinking (with $p = 0.425$), and that the level of involvement affects the level of purposefulness (at $p = 0.417$), perseverance (at $p = 0.523$), flexibility of thinking (at $p = 0.321$), but does not affect the level of innovation (at $p = 0.213$).

Based on the fact that in most cases the relationship was confirmed, we found that the process of solving problems in joint activities, namely in a situation of competition and cooperation, which is represented by indicators of the level of control and personal involvement, affects the level of development of such components of strategic and systemic thinking as dedication, perseverance, psychological readiness for innovation and flexibility of thinking.

7. Conclusion

A scientific-theoretical analysis of psychological and philosophical sources proves that the concepts of strategic and systemic thinking for the scientific world are new, and, therefore, have not been studied from all sides. That is why there is no single definition capable of reflecting the key features of these types of thinking and there is no universal technology for their development. In order to clarify the definition, we considered the genesis of ideas about the phenomenon of thinking and the prerequisites for the formation of a separate type of strategic thinking in the works of domestic and foreign scientists. Based on the analysis of scientific papers, we tried to combine the key features of strategic and systemic thinking in one definition to create a common understanding.

Strategic thinking, as a complex, multi-faceted process of forming a clear, but at the same time flexible action plan, a process that includes a variety of personality components and qualitative characteristics of thinking, but not reduced to a simple set of components and characteristics. We understand systemic thinking as a special approach to understanding the meanings and patterns in the occurring phenomena, the ability to define systems, the ability to see the interrelations and interdependencies of the elements within these systems.

Based on the analytical work, a cyclical scheme of the strategic decision-making process was proposed, including problem statement, search, evaluation, choice of options for actions and resources, implementation of the plan and control of the occurrence of risks. An empirical study allowed us to clarify our hypothesis that it is the process of solving problems in joint activities that contributes to the development, formation and manifestation of strategic and systemic thinking. After analyzing the features

of the thinking process, we came to the conclusion that the process of solving problems in joint activities, namely in a situation of competition and cooperation, which is represented by indicators of the level of control and personal involvement, influences the level of development of such components of strategic and systemic thinking as purposefulness, perseverance, psychological readiness for innovation and flexibility of thinking. The hypothesis that the development of strategic and systemic thinking in adolescence is possible in the process of solving problems was confirmed.

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