

THEORETICAL FOUNDATIONS OF DEVELOPING DIVERGENT THINKING IN PRESCHOOL CHILDREN

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Abstract

The article examines the theoretical foundations of developing divergent thinking in preschool children from the standpoint of the systemic-activity approach. It analyses different interpretations of the concept of "activity" and substantiates the role of play and the leading importance of intrinsic motivation. The concept of divergence is compared across mechanics, mathematics and biology and interpreted as separation followed by integration into a new whole. The article describes the structure of creativity, the cognitive, motivational and personal-reflexive components of divergent thinking, and the stages of the thinking process. The conclusions provide a basis for developing a play-based methodology for fostering divergent thinking in children.

Keywords: Divergent thinking, divergence, preschool children, systemic-activity approach, activity, motivation, creativity, reflection, play.

Introduction

Modern education is faced with the task of raising a child who does not merely memorise ready-made knowledge but is able to find independent solutions in new situations. The foundation of this ability is divergent thinking, that is, the capacity to generate many ideas in different directions in response to a single question or task. This type of thinking is especially important in the preschool years, when a child's imagination, curiosity and play activity develop most actively.

J.Guilford was the first to distinguish between divergent and convergent thinking. He characterised divergent thinking by such qualities as fluency (speed), flexibility, originality and accuracy (elaboration) [1]. According to E.Torrance's research, creative abilities reach their peak at the age of 3.5–4.5 years [2; 3]. This identifies the preschool period as one of the most favourable stages for shaping divergent thinking. The development of divergent thinking in older preschool children through creative play was examined in the research of I.A. Maidannik [4].

Nevertheless, the task of linking the theoretical foundations of developing divergent thinking in preschool children with such concepts as activity, motivation and reflection within a single system has not been sufficiently addressed. This gap determines the relevance of the present article.

The aim of the article is to clarify, on the basis of the systemic-activity approach, the theoretical foundations of developing divergent thinking in preschool children. To achieve this aim, we analysed the interpretations of the concepts of “activity” and “divergence” and examined the structure of creativity as well as the components and stages of divergent thinking.

Research methods: theoretical analysis of scientific literature, comparison, generalisation and the systemic approach.

Main Part

1. The Systemic Approach and the Concept of Activity

In studying how the various qualities and characteristics of divergent thinking are formed in preschool children, the many factors that influence it must be considered not separately but in systemic interaction. At this age, all aspects of a child’s personality are still taking shape, so a change in one aspect inevitably affects the others. For this reason, the view that the child’s physical, intellectual, social and emotional subsystems develop in constant interconnection is of considerable methodological importance [5]. For example, a child’s sense of freedom and calm during play (the emotional subsystem) directly affects the child’s ability to put forward new ideas (the intellectual subsystem), to cooperate with peers (the social subsystem) and to carry out play actions (the physical subsystem).

In our view, any system must be dynamic: it must rely on a “growth base”, retain a reserve capacity for change, and be able to abandon in good time methods that once gave results but no longer fit new conditions. For a pedagogical system, this means that the development of divergent thinking should rest not on rigid forms oriented toward a single outcome, but on flexible, changeable conditions that allow the child to find new ideas.

Within the systemic-activity approach, we must first clarify the essence of the concept of “activity”. This issue has been explored in the works of B.G. Ananyev, P.K. Anokhin, A.G. Asmolov, L.S. Vygotsky, S.Yu. Golovin, V.E. Kemerov, A.N. Leontiev, B.F. Lomov, S.L. Rubinstein and other scholars [6; 7; 8; 9; 10; 11; 12 and others], yet the concept is interpreted in different ways.

S.Yu. Golovin defines activity as a dynamic system of the subject’s active interaction with the external world, in which the subject satisfies his or her needs by acting purposefully on the object [13]. V.E. Kemerov approaches activity from a social perspective and describes it as the way in which social processes are reproduced, people express themselves and realise their connections with the outside world [14]. From the standpoint of S.L. Rubinstein, activity is a form of a person’s active and purposeful interaction with the external world, which responds to the need that gave rise to this interaction [15]. At the same time, a need acquires its specific content only in the object of activity [16]. In other words, even when a child is interested in something, this interest becomes a developmental force only when it is expressed in an action directed at a specific object, for example, in play.

Summing up these interpretations, we support the well-founded views of scholars within the systemic-activity approach: practical activity is the initial, fundamental type of activity in a person’s individual and social development. For preschool children, the most natural form of

such activity is play. In play, the child sets goals, chooses means, changes actions and evaluates results. It is precisely these aspects that create the conditions necessary for divergent thinking.

2. Activity and Motivation

The result of an activity is achieved by actively involving children in the process and by having them receive, process and transform information that serves different purposes. In this process, stimuli initially given from outside are internalised and acquire the capacity to become the child's own internal, personal motives [17]. For example, a game that begins at the educator's suggestion may, over time, turn into an activity based on the child's own interest. L.I. Bozhovich's research shows that activity is stimulated not only by internal motives but also by external ones, that is, social and narrowly personal motives. This makes it possible to identify and take into account the reasons for and mechanisms of a child's transition from one motive to another. As a result, by organising activity on the basis of intrinsic motivation, it becomes possible to form the leading motive [18].

Since the system-forming factor of activity is motive (internal or external), in designing a model for forming divergent thinking through play we organise its conditions so that they rely on the child's internal motives. This approach helps to establish the priority of the achievement motive, especially in cognitive activity. The more the child feels that his or her idea is accepted and valued, the stronger the drive to search for new options becomes.

3. The Concept of Divergence in Different Sciences

To understand the essence of divergent thinking more deeply, we turn to the concept of "divergence" itself. Divergence is a phenomenon characteristic of all objects considered as systems, including their structures, relations and connections, networks and complexes of various natures. The processes of divergence and convergence occur continuously in biological evolution, in anthropogenesis and ethnogenesis, in the development of society's culture, in the formation of human language and thought, and in the progress of knowledge and science. The specific mechanisms that explain these phenomena, and development in general, are revealed by the general and specialised sciences, above all mathematics, formal logic, mechanics, biology, synergetics and others.

In classical mechanics and in the kinematics branch of physics, divergence is one of the key concepts. It is interpreted as the existence and dynamics of systems, network structures and various flows: it implies the splitting of changes occurring at a given point into parts, that is, division within the framework of time and coexistence [19]. In mathematics (where the term was introduced by W. Clifford), divergence is defined as the limiting value of the ratio of the flux of a vector field through a closed surface surrounding a point to the volume bounded by that surface, as the surface shrinks to the point [20; 21].

In biology, the concept of divergence is associated with the name of Charles Darwin. In this science it denotes, first, the gradual separation of characters and properties in originally related organisms in the course of evolution; this leads to the emergence of new characters, which later become established as a new species or quality [22; 23]. Second, divergence also refers to the splitting of a single community into two as a result of external or internal causes [24].

A comparison of these definitions shows that in mechanics, mathematics and biology alike, divergence is associated with separation from unity, spreading from a single point in different directions and, as a result, the emergence of new properties. On this basis, we understand divergence as a distinctive quality of the activity, existence and development over time of objects of any kind; that is, as the property and capacity of an object to split according to its characteristics and later to merge again into a new whole. In relation to thinking, this is manifested as follows: starting from a single task, the child puts forward ideas in several directions and then combines them into a new, original solution.

We understand thinking as a special type of activity and the highest form of human creative activity. It is connected with the reflection of objects, with their subjective images, and with the transformation of their meaning and content in the individual's consciousness. Thinking is mediated by the object and is governed by internal regularities such as goals and motives. It serves to resolve real contradictions, to set new goals and to find new means and plans for achieving them.

4. The Structure of Creativity in Divergent Thinking

The structure of creativity, which is one of the key principles of divergent thinking, comprises the following components:

- abilities and inclinations, manifested in high sensitivity and in the dynamism of mental processes;
- rapid assimilation of novelty and the formation of associative connections;
- interests, including their direction, frequency of manifestation and systematic nature;
- cognitive interests, curiosity and the drive to create something new;
- a constant tendency to compare and contrast, and the development of criteria for the final choice;
- the manifestation of general intellect: quick grasping, understanding, evaluating and choosing a way to the solution;
- the ability to combine, to find analogies, to restructure and to substitute options; economy in solutions and rational use of means and time; and also intuitiveness, that is, a tendency to evaluate quickly, make decisions and anticipate outcomes;
- the ability to develop personal strategies and tactics in solving new problems and tasks, and the skill of finding a way out of complex, non-standard and extreme situations.

Most of these components begin to form in the preschool years. For example, curiosity and the drive for novelty are natural characteristics of children of this age, and supporting them during play lays the foundation for divergent thinking. Using objects in different ways, renaming them or adapting them to new play situations are the first manifestations of the ability to combine and to find analogies.

On this basis, we consider intellectual activity to be the main characteristic of creativity in divergent thinking. It combines two components: the cognitive and the motivational. However, from the standpoint of forming divergent thinking, a further, personal aspect must be singled out. This aspect is of particular importance in developing effective means of psychological and pedagogical influence on thinking activity.

5. The Personal-Reflexive Component and the Stages of the Thinking Process

Our reasoning is as follows: if the personal-emotional aspect is connected with the initial conditions of the thinking process and predominates at the stage of accepting and setting the task, then the personal-reflexive aspect takes the lead in searching for and finding the solution. Existing attempts to manage thinking by influencing values, motivation and emotions do not significantly increase the effectiveness of problem solving. For this reason, they cannot be the main factor in methods for forming divergent thinking. Reflection, by contrast, is a more suitable tool, because it creates a natural connection and mutual penetration between the cognitive and personal aspects of thinking and forms a single functional field. With preschool children, this is seen in the educator's questions, such as "Why did you do it this way?" and "How else could it be done?", which support the child's reflection on his or her own actions and ideas.

A constructive solution to the problem of forming divergent thinking involves incorporating it into the content of the task and carrying out the activity in a conditional problem situation. It is therefore appropriate to single out the personal-reflexive aspect of thinking in problem solving as a third component.

The criterion of an act of divergent thinking is a level transition. The need for new knowledge forms at the highest level of organisation of creative activity, while the means of satisfying this need arise at lower structural levels. According to Ya.A. Ponomarev, the basis of successfully solving creative tasks is the ability to act "in the mind", which is determined by a high level of development of the internal plan of action [25]. The types of action across levels change and pass into one another depending on the stage of problem solving. This makes it possible to analyse the details of the thinking process and to identify the levels at which divergent thinking appears and its degree of activity. In preschool children, the internal plan of action is still being formed, so at first it relies on external, object-based actions. For this reason, play and acting with objects are an important means of developing this plan.

When the dynamics of the thinking process are analysed in terms of its central event, the discovery of the correct solution, the following stages can be distinguished.

1. Realisation of inconsistent representations (the stage of preparing for the solution).

This stage ends with the "blocking" of the object-operational action. The action continues to mature within this blockage and, in a successful case, ends in inspiration, that is, insight. This phenomenon is important for understanding the nature of the insights that may occur in solving divergent tasks. An example is a child who stops when the usual method brings no result during play and then unexpectedly finds a new solution.

2. Realisation of the principle of the correct solution. This stage occurs when a solution is found; in the case of an incorrect solution, it does not occur.

The use of such specific methodological criteria makes it possible to distinguish one stage from another and to describe the regularities and dynamics of changes in content-related control at the stages of problem solving in each specific situation.

Conclusion

The analysis of the theoretical foundations of developing divergent thinking in preschool children leads to the following conclusions.

1. The problem of developing divergent thinking should be studied on the basis of the systemic-activity approach, taking into account the interconnection of the child's physical, intellectual, social and emotional subsystems.
2. Activity is the subject's purposeful interaction with the external world and is determined by need and motive. For preschool children, the main form of such activity is play. Because external motives are internalised and become internal motives, it is important to organise play activity on the basis of the child's intrinsic motives.
3. Although divergence is expressed differently in mechanics, mathematics and biology, in general terms it denotes separation from unity and the emergence of a new quality. We understand it as the capacity of an object to split according to its characteristics and later to merge again into a new whole.
4. The main characteristic of creativity in divergent thinking is intellectual activity, whose cognitive and motivational components are joined by the personal-reflexive aspect of thinking as a third component. Reflection unites the cognitive and personal aspects in a single functional field.
5. The criterion of an act of divergent thinking is a level transition, and the thinking process proceeds through the stages of realising inconsistent representations, blockage, insight and realising the principle of the correct solution.

In practical terms, this requires involving children in play activity, relying on their intrinsic motivation, asking open-ended questions that encourage them to find several solutions to a single task, and supporting the child's reflection on his or her own ideas through reflective questions. The theoretical conclusions obtained provide a basis for developing a methodology for fostering divergent thinking in preschool children through play and for testing it experimentally.

References

1. Гилфорд, Дж. Три стороны интеллекта // Психология мышления. – М.: Прогресс, 1965. – С. 433–456.
2. Ильин, Е.П. Психология творчества, креативности, одаренности. – СПб.: Питер, 2011. – 448 с.
3. Torrance, E.P. The nature of creativity as manifest in its testing // Sternberg R.J. (Ed.). The nature of creativity. – Cambridge, 1988. – 379 p.
4. Майданник, И.А. Развитие дивергентного мышления у старших дошкольников в процессе креативных игр: дис. ... канд. психол. наук. – Ставрополь, 1997. – 165 с.
5. Зверева, Н.М. Практическая дидактика для учителя. – М.: Педагогическое общество России, 2001. – 256 с.
6. Ананьев, Б.Г. Человек как предмет познания. – СПб.: Питер, 2001. – 339 с.
7. Андреева, А.Д. Оценка школьных учебников с позиций личностных смыслов и учебных задач. – М.: Лица, 2003. – 64 с.

8. Асмолов, А.Г. Культурно-историческая психология и конструирование миров. – М.: МПСИ; Воронеж: НПО «МОДЭК», 1996. – 768 с.
9. Выготский, Л.С. Психология. – М.: ЭКСМО-Пресс, 2000. – 1006 с.
10. Краевский, В.В. Методология научного исследования: пособие для студентов и аспирантов гуманитарных университетов. – СПб.: СПбГУП, 2001. – 128 с.
11. Леонтьев, А.Н. Избранные психологические произведения: в 2 т. Т. 1. – М.: Педагогика, 1983. – 387 с.
12. Рубинштейн, С.Л. Основы общей психологии. – СПб.: Питер, 2005. – 713 с.
13. Словарь психолога-практика / сост. С.Ю. Головин. – 2-е изд., перераб. и доп. – М.: АСТ, 2001. – 976 с.
14. Кемеров, В.Е. Современный философский словарь. – М.: Академический проект, 2004. – 864 с.
15. Рубинштейн, С.Л. Основы общей психологии. – СПб.: Питер, 2005. – 713 с.
16. Леонтьев, А.Н. Избранные психологические произведения: в 2 т. Т. 1. – М.: Педагогика, 1983. – 387 с.
17. Леонтьев, А.Н. Избранные психологические произведения: в 2 т. Т. 1. – М.: Педагогика, 1983. – 387 с.
18. Божович, Л.И. Проблемы формирования личности: избранные психологические труды / под ред. Д.И. Фельдштейна. – М.: Институт практической психологии; Воронеж: НПО «МОДЭК», 1997. – 352 с.
19. Айзерман, М.А. Классическая механика. – 2-е изд., перераб. – М.: Наука, 1989. – 368 с.
20. Лопатников, Л.И. Экономико-математический словарь. – 5-е изд., перераб. и доп. – М.: Дело, 2003. – 520 с.
21. Математический энциклопедический словарь / под ред. Ю.В. Прохорова. – М.: Советская энциклопедия, 1988. – 848 с.
22. Яблоков, А.В. Дивергенция // Большая советская энциклопедия. – М.: Советская энциклопедия, 1972. – Т. 8. – 897 с.
23. Яблоков, А.В., Юсупов, А.Г. Эволюционное учение. – М.: Высшая школа, 2004. – 312 с.
24. Реймерс, Н.Ф. Популярный биологический словарь. – М.: Наука, 1991. – 544 с.
25. Пономарёв, Я.А. Психология творчества. – М.: Наука, 1976. – 304 с.