



Article

Theoretical Stages of Studying Students' Intellectual Development

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Abstract: This article explores the fundamental theoretical and methodological foundations of studying and assessing students' intellectual development in the modern, transforming educational system. The paper provides a comparative analysis of advanced ideas from global and local psychological and pedagogical schools, specifically focusing on the fundamental concepts of J. Piaget, L.S. Vygotsky, and S.L. Rubinstein, to comprehend the laws of intellectual progression. Furthermore, it highlights the role of systematic, activity-based, and personality-oriented approaches in optimizing students' intellectual potential within the national educational framework. The article analyzes empirical methods and contemporary trends in developing students' intelligence under digital transformation conditions and puts forward relevant scientific and practical recommendations.

Keywords: intellect, cognitive development, methodology, cultural-historical concept, activity approach, zone of proximal development, digital environment, intellectual structure.

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INTRODUCTION

In the strategy of socio-economic and cultural-educational development of New Uzbekistan, the development of human capital and the radical improvement of the quality of education have been defined as priority tasks. As the 21st century is regarded as the age of information and high technologies, it requires members of society, especially the younger generation, to possess high intellectual potential, adaptability, systematic analysis, and independent thinking abilities[1]. The intellectual development of students is not only a factor of individual personal success but also the foundation of the national intellectual capital, which is considered a strategic resource of the country. Therefore, the scientific study of the mechanisms of students' intellectual development in general secondary schools and specialized educational institutions, as well as identifying their regularities, remains an actual pedagogical and psychological issue[2].

The implementation of the Law of the Republic of Uzbekistan "On Education" and the National Curriculum has fundamentally changed the educational paradigm. Previously, the educational process was mainly focused on the acquisition of ready-made knowledge (reproductive approach), whereas today priority is being given to the formation of competencies such as independent learning, making non-standard decisions in problematic situations, and demonstrating creative-intellectual potential (productive approach)[3]. In order to effectively manage students' intellectual development, it is first necessary to deeply understand the theoretical and methodological foundations of this process and to integrate historical and modern approaches. The purpose of this research is to analyze the most important gnoseological and methodological principles of studying students' intellectual development and to substantiate their significance in modern

LITERATURE REVIEW

The problem of intellectual development has a long historical background and has been studied within various conceptual approaches in world psychology and pedagogy. Jean Piaget, a prominent representative of cognitive psychology, evaluated intelligence in his theory of cognitive development as the highest form of adaptation to the external environment. According to Piaget, a child's intellectual development occurs step by step, and each stage is characterized by specific cognitive structures (schemas). The scholar distinguished four main stages according to the child's age characteristics: the sensorimotor stage, the preoperational stage, the concrete operational stage, and the formal operational stage. The methodological significance of Piaget's approach lies in the fact that he opened the way to understanding intelligence not as a static condition, but as a dynamic system constantly changing through the processes of association, assimilation, and accommodation[5].

While Jean Piaget emphasized biological determinism, the distinguished psychologist L. S. Vygotsky, in his cultural-historical concept, brought the social and cultural determinants of intellectual development to the forefront. According to Vygotsky, the higher mental functions of a person (including voluntary attention, logical memory, and verbal thinking) initially appear as forms of external social activity in interpersonal relations (interpsychic) and later become an internal characteristic of the individual (intrapsychic) as a result of the process of internalization[6]. The concept of the "Zone of Proximal Development" introduced by Vygotsky created a revolutionary turn in educational psychology. This concept methodologically proved that education should not follow development, but rather precede and guide it[7].

Within the framework of the activity-based approach, S. L. Rubinstein and A. N. Leontyev studied intellectual development in close connection with a person's activity aimed at transforming objective reality. Rubinstein's fundamental principle that "external influences are refracted through internal conditions" makes it possible to understand the student's intellect not as a passive subject that simply receives external information, but as an active creator who processes and transforms it[8]. In the Russian school of psychology, the "developmental education" system developed by D. B. Elkonin and V. V. Davydov also practically demonstrated that intelligence can be intensively developed through the formation of theoretical thinking and generalization skills in students[9].

A significant scientific heritage has also been created in the Uzbek national school of psychology and pedagogy regarding the study of students' intellectual potential. In his research, Academician E. G'oziyev deeply analyzed the regularities of the ontogenetic development of students' thinking and the problems of forming independent thinking. Professor M. G. Davletshin systematically studied the dynamics of students' technical and intellectual abilities, as well as their age and individual characteristics[10]. In addition, scholars of our republic such as S. Jalilova, V. Tokareva, and B. Qodirov conducted scientific research on increasing the effectiveness of students' cognitive processes and on the problems of intellectual diagnostics. However, under the conditions of the modern information society and globalization, changes in the intellectual architectonics of students require reconsideration of this issue from new methodological perspectives[11].

RESEARCH METHODOLOGY

The study of students' intellectual development is a complex, multidimensional, and multilevel process that cannot be confined within a single methodological approach. Therefore, the study of this problem was based on the following system of fundamental methodological principles and approaches:

1. Systemic Approach.

This approach considers intelligence not as a collection of separately isolated cognitive functions (memory, attention, perception), but as a holistic integral psychological system consisting of their interrelated connections. In this case, a change in one element leads to the transformation of the entire intellectual structure.

2. Activity-Based Approach.

A student's intellectual abilities are formed during the process of his or her leading activity (at school age – educational-cognitive activity), refined throughout the process of development, and manifested in the productivity of this activity.

3. Personality-Oriented Approach.

Intellectual development is studied in accordance with each student's individual cognitive style, temperament, motivation, and interests.

4. Synergetic Approach.

Within the framework of modern science, intelligence is interpreted as a nonlinear, self-organizing open system that changes its dynamic balance under the influence of external information.

Based on these theoretical principles, it is considered appropriate to apply the following set of methods in studying students' intellectual levels: psychometric methods (Wechsler Intelligence Scale for Children – WISC, Raven's Progressive Matrices, Amthauer's Intelligence Structure Test), cognitive monitoring, pedagogical observation, and the formative experiment method. Such methodological polyphony makes it possible to objectively evaluate both the quantitative parameters (IQ indicators) and qualitative parameters (logic, creativity, flexibility) of students' intelligence.

RESULTS AND DISCUSSION

An in-depth analysis of the theoretical and methodological foundations of students' intellectual development shows that the content of the concept of intelligence has significantly expanded in the modern era. While in classical psychometrics intelligence was mainly limited to logical-mathematical and verbal abilities, today the concepts of multiple intelligences (according to H. Gardner) and emotional intelligence (EQ) are rapidly entering educational practice. In the pedagogical process, assessing only the academic intelligence of a student does not fully reflect his or her potential in real-life and social environments. The intellectual development of a student is directly related to metacognitive skills, namely the ability to consciously manage and control one's own cognitive processes[12].

In the age of digitalization, new phenomena in students' intellectual development have emerged – “Digital Intelligence” (DQ) and “clip thinking.” From a methodological point of view, modern students possess the logic of rapidly processing large volumes of information visually; however, a decline is observed in their ability to deeply analyze information conceptually and maintain cause-and-effect relationships within long-term logical chains. This situation creates new methodological tasks for the education system. In other words, it is necessary to abandon traditional memorization methods in the educational process and to develop students' critical thinking and problem-solving abilities through the application of heuristic, problem-based, and project-based teaching methods (for example, STEM and STEAM technologies)[13,14].

In studying students' intelligence, it is methodologically very important to correctly evaluate the relationship between biological (genetic) and social (pedagogical) factors. Research shows that although intellectual potential has a genetic basis, up to 80% of its actual manifestation and level of development depends on the social-pedagogical environment, namely the quality of education and upbringing, as well as the intellectual climate within the family. Therefore, creating individualized educational trajectories adapted to the intellectual needs of each student on the basis of inclusive and differentiated education principles is considered one of the most promising directions of modern school pedagogy[15,16].

CONCLUSION AND RECOMMENDATIONS

As a result of studying the theoretical and methodological foundations of students' intellectual development, the following fundamental conclusions were reached:

First, intellectual development is a multi-component dynamic system, and its effectiveness is ensured through the integration of biological factors and purposeful socio-pedagogical influence (education).

Second, L. S. Vygotsky's concept of the Zone of Proximal Development and the activity-based approach should serve as the foundation of modern innovative pedagogy.

The content of education should be one step ahead of the student's current intellectual capabilities and should encourage him or her to overcome intellectual difficulties.

Third, under the conditions of the information society, the intellectual diagnostics of students should not be limited only to static tests, but should also be conducted on the basis of formative monitoring that demonstrates the student's dynamic developmental potential.

Based on the results of the research, the following practical recommendations are proposed for educational system specialists, school psychologists, and teachers:

- To include more special interactive modules, cognitive games, and heuristic exercises aimed at developing logical, critical, and creative thinking in educational curricula;
- To systematically diagnose the intellectual structure of students within the school psychological service system and to develop individualized developmental programs for students with low cognitive indicators;
- To form a culture of using digital technologies in education and to introduce methodologies for transforming clip thinking, which emerges under the influence of visual gadgets, into deep analytical and systematic logical thinking.

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