

STRUCTURAL–FUNCTIONAL MODEL OF FORMING THE TEACHERS’ READINESS TO MANAGE THE DEVELOPMENT OF INTELLECTUALLY GIFTED STUDENTS

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Abstract

The relevance of the studied problem is caused by the need to realize the intellectual and creative potential of a person as one of the main resources for the society development. This actualizes the complex of problems associated with the development of intellectually gifted students. The article is devoted to the problem of forming the teachers’ readiness to manage the development of intellectually gifted students. The purpose of the study is to build a structural-functional model of forming the teachers’ readiness to manage the development of intellectually gifted students. The theoretical and methodological basis for building the model was the system-activity approach, according to which the effectiveness of the process of forming the teachers’ readiness to manage the development of intellectually gifted students depends on the organization of systemic influences, the creation of an enriched educational environment. It is proposed to carry out heuristic activities individually or as a team based on life situations. To obtain objective, evidence-based data and to identify the level of elaboration of a scientific problem, such theoretical and empirical research methods as analyzing pedagogical scientific literature and pedagogical experience, summarizing, as well as a questionnaire survey were used. For the experiment, a plan with input (zero experiment) and output diagnostics (final experiment), using control and experimental groups was chosen. 37 teachers of educational institutions of Kostanay city (Kazakhstan) took part in the experiment. Empirical data obtained from the experimental results indicate a divergence in the levels of forming the studied readiness among the respondents in the control and experimental groups. As a result of theoretical analysis and generalization of the empirical material obtained during the study, the term “the teachers’ readiness to manage the development of intellectually gifted students” is considered as an integrative personality phenomenon, the formation of which is a complex and multidimensional process, which cannot be fully explored from one perspective. The structure and functions of the model are determined. The model includes motivational-targeted, content-technological and evaluation-effective components. It is characterized by a focus on the teacher’s subjective experience, active stimulation of creative activity, reproducibility, integrativity, ambivalence, adaptability. The model requires general didactic and specific principles of professional and pedagogical training, methodological support of the educational process. Each component performs its own functions. Special attention is paid to a system of principles, which the model of forming the teachers’ readiness to manage the development of intellectually gifted students is based on. These include the principle of self-actualization, manufacturability, subjectivity, accumulation of experience, creativity and success, variability, return and discreteness. Materials of the article can be useful for experts working in educational institutions and researchers who are connected with pedagogy.

Keywords: Education, teacher, student, intellectually gifted, model, readiness, development.

1 INTRODUCTION

In the modern, rapidly changing and high-tech world, there is an increase in interest in the realization of the intellectual and creative potential of man as one of the main resources for the society development. In this regard, the problem of training competitive, creative specialists capable of critical thinking, mobility, and non-standard solutions to emerging problems is acute. This actualizes the complex of problems associated with the development of intellectually gifted students.

Currently, State programs are being implemented to find, support and develop gifted children and young people. Their main objectives are: 1) to define a strategy for the search, education and training of gifted children and youth; 2) to support and develop the unified and continuous formation of the intellectual potential of society; 3) to promote the socio-cultural formation of talented youth. In the light of these tasks, fundamentally new educational organizations are being created, working with this category of students, and the personnel management system is being developed. In the works of many scientists

[1], [2], [3], [4], [5] it is noted that the training of teachers in this direction is most often unsystematic, focused on the development of subject competencies. The analysis of educational programs of pedagogical universities confirms this conclusion. In particular, among the compulsory disciplines, there are no courses aimed at training future specialists in the management of the development of intellectually gifted students. The catalogs of elective disciplines contain single courses: "Solving Olympiad problems", "Psychology of giftedness", "Methods of working with gifted children", etc., which are not chosen by all students at the undergraduate level. In this regard, future teachers have not formed the competencies necessary for the development of intellectually gifted students. The level of teachers' readiness to manage the development of intellectually gifted students is insufficient.

Thus, the purpose of the research is to build a structural-functional model of forming the teachers' readiness to manage the development of intellectually gifted students.

2 METHODOLOGY

The theoretical and methodological basis for building the model was the system-activity approach.

Searching the possibilities of using the system-activity approach [6], [7] to study the problem of forming the teachers' readiness to manage the development of intellectually gifted students, we have chosen this approach as a general scientific level. The system-activity approach provides a system vision of the educational process, allows establishing the level of the pedagogical system integrity, the degree of interrelation and interaction of its components. The leading concepts of the system-activity approach are "system" and "activity", and its backbone is the category of "subjectivity". Let us take a closer look at these concepts.

In pedagogy, the system refers to "an ordered set of interrelated elements distinguished on the basis of features, united by a common goal of functioning and unity of control, and acting in interaction with the environment as a holistic phenomenon" [8]. Based on this definition, we will first consider the systemic features of the process of forming the teachers' readiness to manage the development of intellectually gifted students, on the basis of which a model will be developed in the future.

A pedagogical process is aimed at the conscious and durable assimilation of knowledge, abilities and skills, experience of creative activity necessary to manage the development of intellectually gifted students by teachers. As a pedagogical process, it can be identified both as a pedagogical system and as an activity. The process of forming the teachers' readiness to manage the development of intellectually gifted students is a combination of the following interconnected elements: the goal, the subjects of this process, its content, ways to achieve the goal, the result.

Activity is a specifically human form of active attitude towards the world, the content of which is an expedient change and transformation of the world based on the development of culture forms. In accordance with the system-activity approach, activity is a natural development of the system, leading to a certain result.

The activity interpretation of the process of forming the teachers' readiness to manage the development of intellectually gifted students allows presenting it as a set of diverse interrelated and interdependent activities of all participants involved in it. This participation ensures the acquisition of relevant competencies, the acquisition of spiritual, moral and social experience, the development of individual abilities, self-regulation leading to metacognition.

The system-forming concept of the system-activity approach is "subjectivity". Being a characteristic of personality subjectivity directly expresses the attitude of a person to himself as an actor, transformer, and creator. Subjectivity focuses on the actively transformative function of the individual.

The researchers A.G. Asmolov [6], A.V. Khutorskiy [7] emphasize the following principles of the system-activity approach: activity, continuity, integrity, psychological comfort, variability, creativity. Without dwelling on their detailed characterization, we note that their observance will ensure such an organization of the educational process, which will fill it with socially, professionally and personally significant meanings. It will provide teachers, participants of the advanced training courses with the formation of readiness to manage the development of intellectually gifted students as well as with the opportunity to self-fulfill in it and achieve personal success. The main features of the system-activity approach are the following:

- 1 The formation of the teachers' readiness to manage the development of intellectually gifted students as a pedagogical system is open, probabilistic, has flexibility, dynamism, manageability and is aimed at maximizing the potential of the educational process subjects;
- 2 The effectiveness of the process of forming the teachers' readiness to manage the development of intellectually gifted students depends on the organization of systemic influences, the creation of an enriched educational environment, characteristic features of which are innovation, creativity, research activity of its subjects;
- 3 Methods that promote self-development, self-actualization, self-improvement are used in the process of forming the teachers' readiness to manage the development of intellectually gifted students; it is proposed to carry out heuristic activities individually or as a team based on life situations;
- 4 The readiness to manage the development of intellectually gifted students acts as an integrative personal education, which manifests itself at a subjective level as a complex system integrating motivational, cognitive-operational and personal components.

3 RESULTS

In the dictionary of modern concepts and terms "model" means an ideal copy of a real object, which reproduces the most essential features, properties, phenomena that are determining and important in relation to the result [9].

The model allows to visualize the process of forming the teachers' readiness to manage the development of intellectually gifted students more clearly, to reveal its internal structure, to show links between structural components and define the functions performed by each of them.

The teachers' readiness to manage the development of intellectually gifted students is considered as an integrative personality phenomenon, the formation of which is a complex and multidimensional process. It cannot be fully explored from one perspective. It is necessary to use the idea of complementary, integrated development of approaches in the study of pedagogical phenomena [10].

The model of forming the teacher' readiness to manage development of intellectually gifted students is based on general principles (scientificity, consistency, accessibility, individualization, optimality, flexibility, controllability, development, connection of theory with practice, professional orientation). Modern scientific achievements, rather than outdated information, affect the teachers' readiness to work with intellectually gifted students (*the principle of scientificity*). The teachers' readiness is formed step by step, based on the already existing knowledge, skills, experience (*the principle of consistency*). Thanks to the use of *the principle of theory connection with practice*, practical skills namely observation, experiences, experiments, solving problematic pedagogical tasks are formed on the basis of theoretical knowledge. The productivity of the process of forming the teachers' readiness to manage the development of intellectually gifted students is ensured by the implementation of *the principle of optimality*. The teachers should ensure self-realization and preparation for the process of managing the development of intellectually gifted students (*the principle of individualization and differentiation*). The implementation of *the principle of professional orientation* ensures the formation of teachers' professional qualities and abilities.

Specific principles characterize the requirements for the process of forming the teachers' readiness to manage the development of intellectually gifted students. These include the principle of self-actualization, manufacturability, subjectivity, accumulation of experience, creativity and success, variability, return and discreteness.

The principle of self-actualization reveals the potential of individual abilities, leads to a desire for development. Guided by this principle, the teachers seek to expand and deepen knowledge, improve professional skills in the field of managing the development of intellectually gifted students.

The implementation of *the principle of subjectivity* ensures the development of the teachers' personal qualities, their abilities, and awareness of their own selves. On the basis of this principle, both self-determination and self-development of the teachers' personalities take place in the process of forming readiness to manage the development of intellectually gifted students. It helps to understand that the teacher is a subject of the educational process.

The principle of experience accumulation serves to form the teachers' readiness to manage the development of intellectually gifted students taking into account previous pedagogical experience.

The principle of creativity and success. The teachers develop individual characteristics with the help of creative activity. Achieving success in various types of activities contributes to the formation of a positive self-concept, stimulates their further work on self-improvement, and increases their independence and creative activity.

The principle of manufacturability involves modern presentation of material using new technologies, a high degree of independence of intellectually gifted students, constant feedback, deliberation and elaboration of certain pedagogical actions.

The principle of variability provides an opportunity for the teachers to choose a learning trajectory. It is necessary to pay attention to how they are progressing in training, taking into account their personal qualities, abilities and capabilities.

The principle of return and discreteness in the formation of the teachers' readiness to manage the development of intellectually gifted students arises the need to adjust the detected shortcomings; therefore, it is possible to return to any stage of this process.

The developed model is structural-functional, because it has a certain structure characterized by three interconnected components: motivational-targeted, content-technological and evaluation-effective. Each component performs its functions.

The motivational-targeted component ensures forming the teachers' readiness to manage the development of intellectually gifted students, installation on this activity. This component performs the following functions:

- Goal-setting (decomposition and optimal choice of goals in accordance with the stages of forming readiness to manage the development of intellectually gifted students, creation of teachers' target settings for its formation),
- Motivation (development of adequate motivation, creative potential disclosure in accordance with the needs and motives),
- Value orientation (the formation of the teachers' value attitude to work with intellectually gifted students, an active position in managing their development).

The motivational part of this component is aimed at forming personally significant motives of teachers, due to the organized stimulating influence. The teachers should strive for independence, self-realization, self-government. They already have a comprehensive experience of working with students, but for the process of managing the development of intellectual giftedness, they need to develop themselves to use new knowledge and skills in education. Therefore, it is necessary for teachers to update new methods, techniques and means for educational activities when preparing for this type of activity.

The development of the motivational part is realized in the conditions of the subject-subject interaction between the teacher and the student. The teachers should have a high skill in creating situations of discussion and debate, amusing presentation of educational material, creating an emotional favorable atmosphere to develop students' intellectual giftedness. Classes should be conducted in the form of a dialogue and search. Thus, the system of needs, motives, and value orientations determines the activity of the subjects in the process of forming the teachers' readiness to manage the development of intellectually gifted students. These activities are aimed at achieving results and process satisfaction. This determines the motivational-value attitude to work with intellectually gifted students and thus ensures the successful formation of readiness to manage their development.

The targeted part of this component includes the goals of the process of forming the teachers' readiness to manage the development of intellectually gifted students. These goals determine the content and activity side of the process of training teachers to manage the development of intellectually gifted students. They also require targeted work on forming the teachers' knowledge, abilities, and skills to this type of activity. Therefore, the next component of the model is content-technological, which is designed to assimilate knowledge and skills in preparing teachers to manage the development of intellectually gifted students.

The content-technological component of the model includes a set of educational resources used to form the teachers' readiness to manage the development of intellectually gifted students, the conditions for selecting their content, forms, methods, techniques and means of organizing classes.

This component performs different functions namely:

- Learning (acquisition of knowledge and skills necessary for managing the development of intellectually gifted students by teachers),
- Educational (formation of appropriate personality qualities, attitudes, value orientations),
- Developing (creation of necessary conditions for the creative thinking, research and culture development),
- Organizational (realization and coordination of programs and technologies aimed at forming the readiness to manage the development of intellectually gifted students).

Within the framework of the content-technological component, two interrelated types of training are carried out: theoretical and practical.

Theoretical training is aimed at mastering philosophical and ideological knowledge, acquainting with trends in science development, assimilation of general scientific methodological approaches, logical and methodological concepts, general scientific principles and concepts. This type of training is implemented through the analysis of psychological, pedagogical and special literature. This information provides maximum, fundamental and applied training of the teachers at a high methodological level. Since methodological knowledge consists of several structural levels, our study uses three levels: the level of general scientific methodology; the level of specific scientific methodology; the level of the procedure of forming the teachers' readiness to work with intellectually gifted students.

The level of general scientific methodology includes the study of general scientific principles, scientific concepts, general scientific methodological approaches, philosophical and worldview knowledge.

The level of specific scientific methodology includes the study of specific scientific principles, concepts and theories, specific methodological approaches, categories and terms.

The level of the procedure of forming the teachers' readiness to work with intellectually gifted students includes mastering methodological standards for working with intellectually gifted students, requirements for techniques, methods and tools to work with this category of students.

Courses that allow realizing an individual educational trajectory and contribute to more complete formation of certain components of the readiness to manage the development of intellectually gifted students play an important role in the theoretical training of teachers in the formation of the above readiness. One of these courses is the course "Psychological and pedagogical foundations for training teachers to manage the development of intellectually gifted students" developed by the authors. The course content is aimed at acquiring the knowledge necessary for the teachers' readiness to manage the development of intellectually gifted students.

Practical training within the framework of the model's content-technology component consists in mastering knowledge and skills for the development of intellectually gifted students. The ability to manage this category of students should be formed on the basis of knowledge. It is built on previous pedagogical experience and provides a good orientation in the new environment, including creativity. The comprehensive use of various types of technology is a feature of the practical training.

The technological part envisages the use of optimal forms, methods and means for the training of teachers. Professional requirements as well as general cultural, social and creative ones are imposed on teachers. They are required to use modern organizational educational forms based on the application of innovative technologies, the effectiveness of which is shown in the studies of many scientists [11], [12], [13].

The teachers need to use various teaching forms in order to become ready to manage the development of intellectually gifted students. It is necessary to use slide-lectures, problem lectures, practical exercises, research assignments, seminars-discussions during the classes. The teachers should involve students to participate in scientific and practical conferences, competitions and Olympiads in extracurricular activities. The combination of organizational forms of educational and extracurricular activities creates favorable conditions for its systematic use.

The teachers should use the interaction of active, problem and research teaching methods while organizing work to manage the development of intellectually gifted students. Such methods include the method of logical thinking, the research method, the method of material systematization, problem-motivational situations, and joint work in groups. Each of these methods stimulates independence and creativity, obtaining positive emotions when performing tasks.

The means of teachers' readiness for management activities are understood as tools of teachers' activities, which are material and ideal objects involved in the educational process as information carriers and activity tools.

The applied means are divided into three groups:

- 1 Informational: information resources of global and social networks, computer reference systems and encyclopedias, special literature, libraries, etc.;
- 2 Methodological: a program for the development of students' giftedness, educational and methodological manuals;
- 3 Training: special course "Psychological and pedagogical foundations for training teachers to manage the development of intellectually gifted students", coaching, mentoring, case-study, trainings, etc.

The evaluation-effective component of the model provides the feedback establishment in the process of studying the special course "Psychological and pedagogical foundations for training teachers to manage the development of intellectually gifted students". It gives timely receipt of information about difficulties and achievements. The feedback channel is important because it allows the teachers to diagnose this process, evaluate its results, adjust their own actions, differentiate methods and tasks taking into account individual progress and development.

The evaluation-effective component performs a number of functions:

- Informational (providing data on the level of readiness formation);
- Analytical (identifying difficulties and improvement methods);
- Monitoring (comparing the state of readiness to work with intellectually gifted students with reference requirements laid down in the goals);
- Stimulating (developing the teachers' confidence in their own abilities, encouraging activity, independence, interest in working with intellectually gifted students);
- Reflexive (a desire to rethink one's own experience, to provide a research position in the educational process).

The following methods are used to implement the evaluation-effective component: self-assessment, testing, questionnaire.

Thus, the created model includes the properties of traditional pedagogical models (openness, flexibility, dynamism, manageability, variability) and it is focused on active stimulation of the teachers' readiness to manage the development of intellectually gifted students.

The structural-functional model of forming the teachers' readiness to manage the development of intellectually gifted students is characterized by:

- *Adaptability*: the model is adapted to the processes of teacher training;
- *Effectiveness*: the possibility to plan the result in each direction in preparation for managing the development of intellectually gifted students;
- *Reproducibility*: the ability to reproduce the model in the educational process.

The experimental work we have carried out has achieved the following goal: to test the effectiveness of our model of forming the teachers' readiness to manage the development of intellectually gifted students.

For the experiment we chose a plan with input (zero experiment) and output diagnostics (final experiment), using control and experimental groups. 37 teachers of educational institutions of Kostanay city (Kazakhstan) took part in the experiment.

The input diagnostics allowed to determine the levels of the teachers' readiness to manage the development of intellectually gifted students: low, medium, high. The results of the input diagnostics are shown in table 1.

Table 1 Results of the teachers' distribution by levels of their readiness to manage the development of intellectually gifted students (input diagnostics)

Group	Number of teachers in the group	Levels					
		Low		Medium		High	
		Number of teachers	%	Number of teachers	%	Number of teachers	%
CG	18	12	66.7	4	22.2	2	11.1
EG	19	15	78.9	3	15.8	1	5.3

The results of the input diagnostics show that 5.3-11.1% of the respondents have a high level of readiness to manage the development of intellectually gifted students. 15.8-22.2 % of the teachers have a medium level of readiness. The presence of the respondents' predominantly low level of readiness (66.7-78.9%) is a consequence of insufficient attention to this problem at the stage of university preparation. The teachers' readiness to manage the development of intellectually gifted students is not a natural innovation. It requires special actions to form it. The main way to solve this problem is to implement the model of forming the teachers' readiness to manage the development of intellectually gifted students

At the formative stage, the model developed by us was realized and used in the experimental group of the teachers. The results of the output diagnostics are shown in table 2.

Table 2. Results of the teachers' distribution by levels of their readiness to manage the development of intellectually gifted students (output diagnostics)

Group	Number of teachers in the group	Levels					
		Low		Medium		High	
		Number of teachers	%	Number of teachers	%	Number of teachers	%
CG	18	7	38.9	9	50.0	2	11.1
EG	19	0	0.0	6	31.6	13	68.4

Comparing the results of the input and output diagnostics, we can see that there is a significant increase in the number of the teachers with a high level of readiness to manage the development of intellectually gifted students (68.4%) in the experimental group. The number of the respondents with a high level of readiness in the control group has remained unchanged (11.1%). The number of the respondents at the medium level has doubled (from 22.2% to 50.0% in the control group; from 15.8% to 31.6% in the experimental group). The number of the teachers with a low level of readiness in the control group has decreased from 66.7% to 38.9% as well as in the experimental group it has become 0%. Obviously, there is a discrepancy in the levels of the readiness we are investigating.

Thus, the data obtained as a result of the experiment show that the formation of the teachers' readiness to manage the development of intellectually gifted students depends on the implementation of the proposed structural-functional model, not on random factors.

4 CONCLUSIONS

The state of modern society, the existing system of professional education and the analysis of psychological and pedagogical literature indicate the need to train teachers to manage the development of intellectually gifted students. It is due to the following factors:

- 1 Society's focus of on the education and development of intellectually gifted people;
- 2 Society's need for teachers who are ready to manage the development of intellectually gifted students;
- 3 The need for scientific and methodological support in the training of teachers using new forms and methods.

In this research, the model of forming the teachers' readiness to manage the development of intellectually gifted students has been developed on the basis of the system-activity approach. It includes the motivational-targeted, content-technological and evaluation-effective components. Each component performs its own functions.

The model is characterized by a focus on the teachers' subjective experiences, active stimulation of creative activity, reproducibility, integrativity, ambivalence, adaptability. It requires general didactic and specific principles of professional and pedagogical training, methodological support of the educational process.

Empirical data obtained from the experimental results indicate a divergence in the levels of forming the studied readiness among the respondents in the control and experimental groups.

The model is effective as its each component plays a significant role in the formation of the teachers' readiness to manage the development of intellectually gifted students.

Materials of the study can be useful for experts working in educational institutions and researchers who are connected with pedagogy.

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REFERENCES

- [1] D.B. Bogoyavlenskaya, Psychology of giftedness: concept, types, problems. Moscow: MIOO, 2005.
- [2] V.I. Panov, "Gifted children: identification, education and development," Pedagogy, no. 4, pp. 30-44, 2001.
- [3] F.L. Ratner, "Various forms of work with gifted children abroad," Obrazovanie i samorazvitie, no. 4/14, pp. 233–237, 2009.
- [4] N.B. Shumakova, Gifted Child: Learning Features: Teacher's Guide. Moscow: Prosveshchenie, 2006.
- [5] E.I. Shcheblanova, "Interrelation of cognitive abilities and personal characteristics of intellectually gifted schoolchildren," Voprosy psikhologii, no. 1, pp. 13-24, 2013.
- [6] A.G. Asmolv, "Systematic and action-oriented approach to the next generation of standards," Pedagogy, no. 4, pp. 18-22, 2009.
- [7] A.V. Khutorskiy, Methodology of personality-oriented learning. How to Teach Everyone Differently?: A Teacher's Guide. Moscow: VLADOSPRESS, 2005.
- [8] T.A. Il'ina, Systemic and structural approach to the organization of training. Moscow: Znanie, 1972.
- [9] Dictionary of modern concepts and terms. Moscow: Publ. Respublika, 2002.
- [10] G.R. Ereemeeva, R.R. Bikbulatov, A.R. Baranova, "Pedagogical conditions necessary for training teachers to manage the development of intellectually gifted students," Advances in Social Science, Education and Humanities Research (ASSEHR), vol. 97, pp. 37-41, 2017.
- [11] N.S. Algozhaeva, Use of new pedagogical technologies in the educational process of higher education. Almaty, 2009.
- [12] A.K. Mynbaev, Z.M. Sadvakasova, The Art of Teaching: Concepts and Innovative Teaching Methods. Almaty: KazNU, 2012.
- [13] T.S. Panina, Modern ways to enhance learning. Moscow: Akademiya, 2006.