

## Modernization of Russian Education: Development Technology of Scientific and Methodical Readiness among Teachers

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**Abstract:** The study presented the components of scientific and methodical readiness among teachers to support the creative self-development of pupils. A number of problems is highlighted during the assessment of its condition associated with the use of information and communication technologies by teachers at the stages of a student creative self-development. The authors presented the pedagogical conditions and scientific and methodical readiness of teachers development technology to support the creative self-development of students in cognitive activity. These conditions and technology were developed in the context of ongoing processes of education modernization in Russia. The development of pedagogical conditions and the development technologies of a teacher scientific and methodical readiness for the pedagogical support of creative self-development of pupils contributes to the transition of Russian schools to a new didactic model, according to which education contributes to an individual trajectory creation of new knowledge active study, the acquiring of cultural creativity and subject-subject interaction experience.

**Key words:** Socio-cultural environment, creative self-development, scientific and methodical readiness of a teacher, educational support, information and communication technologies

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### INTRODUCTION

The request of the modern society to general education in which a graduate is designated as a self-developing personality, aimed at the development of creative abilities (Halpern *et al.*, 2013; Larson, 2011; Noddings, 2007), requires the understanding of mechanism appearance concerning new knowledge search meaning among students. This, in its turn, encourages the pedagogical community to seek the ways of a child pedagogical support during the stages of his creative self-development, the result of which is the creation of cognitive activity products. We revealed a number of subsystems in the creative self-development of a student: self-knowledge, self-determination, self-organization, self-education, self-regulation, self-control and self-realization. A targeted support of these processes-systems by a teacher presents a structurally meaningful component of the learning process in which a student's development can be traced from the moment of his needs for new knowledge to the moment of its satisfaction during the solution of a problem with a certain level of complexity.

Despite the fact that we live in the age of rapid change, an uncertainty and risk the modern content of general education is dominated by reliable, substantiated,

evidence-based knowledge. The possibilities of students during the solution of complex and cognitive problems are not realized completely. Thus, there is a drop in a child's motivation to the processes of learning and teaching (Ryken, 2001; Vedder-Weiss and Fortus, 2011). Based on the developing potential characteristics of different kinds of education (Seliverstova, 2014), we believe that this process in the Russian general education system is associated with the dominance of the traditional and problem-developing types of learning in which the appearance of senses for new knowledge obtaining among children is not a leading didactic task.

**Formulation of the problem:** The priority in the educational policy of the Russian society is to ensure the conditions for high quality education which promotes personal development, sustainable economic growth, social unity and cultural improvement. Education modernization processes taking place in Russia make teachers focus on a personal developing type of training. Its leading characteristic is the focus on the development of self-worth and the identity of a person, its ability to be and find himself in a particular culture which he independently develops and remodels according to life strategies (Semenov, 2012). An inevitable result of personal self-creation is the intellectual development level

increase, the ability to cultural, life, personal and professional self-determination, to a maximum creative self-realization (Kormakova, 2015; Musaelian and Kormakova, 2014; Makotrova, 2012). Hence, there is the contradiction between the need for scientific and methodical readiness development among teachers to support the creative self-development in their cognitive activity and the spontaneously evolving experience of its development. This contradiction was the basis for the determination of research problem: the determination of the pedagogical conditions and the technologies of scientific and methodical readiness of teachers supporting the creative self-development of students in cognitive activity within the context of education modernization ongoing processes in Russian society.

**MATERIALS AND METHODS**

The solution of the above stated problem is provided by the use of a series of methods: theoretical analysis, modeling, survey, testing, questioning, interviewing, talk, observation, experiment, document analysis, the study and generalization of educational organization experience, statistical data processing using the pearson criterion and the calculations of the statistical weights.

**Main provisions:** Scientific and methodical readiness of a teacher to support the creative self-development of students in cognitive activity is presented in the context of the cultural approach as an integrative quality which manifests itself in the form of relation to the organization of an individual trajectory of a student in knowledge, the skills of teaching material and digital technology use for the organization of a child cognitive activity as the willingness and the ability to convert known pedagogical practices that increase a student’s motivation to the self organization of the learning process.

The diagnosing of Scientific and Methodical Readiness of a Teacher (SMRT) to support the self-development among students in our study was aimed at the identification of the motivation to the pedagogical support of student creative self-development (the degree of enthusiasm for information obtaining concerning the problem of pedagogical support for the creative self-development among students in learning activities;

the degree of electronic educational resource value awareness for the pedagogical support of student creative self-development in learning activities; the degree of meeting intensity with new technologies and didactic means for the pedagogical support practice concerning the creative self-development of students); the technological readiness for the pedagogical support of student creative self-development (the degree of pedagogical support mastering in respect of student creative self-development in learning activities; the degree of digital technology teaching means mastering for the implementation of a subject position among students in cognitive activity, the degree of skill development to relate a pedagogical support problem concerning the creative self-development of students with the educational opportunities of digital technologies and teaching materials), the creativity in pedagogical support problem solution in respect of student creative self-development (the degree of pedagogical creativity manifestation using the technologies of creative self-development support among students; the degree of pedagogical creativity manifestation using the electronic learning environment, accompanied by the creative self-development among students; the degree of polysubject interaction with the educational process participants when you deal with the creative self-development pedagogical support among students in cognitive activity).

The survey (the representative sample makes 340 teachers of Belgorod region) showed that only 24% of teachers are at the heuristic level of SMRT for the support of creative self-development among students in cognitive activity. The majority of teachers showed a low level of digital technology use, accompanied by the creative self-development of students in their cognitive activity shown in Table 1.

The low level of pedagogical orientation is noted during the use of digital media at the stage of self-esteem cognition results by students and cognitive actions (the lowest statistical weight makes 10 points), the focus on freedom of choice provision concerning the tasks, exercises, texts differentiated according to different characteristics in accordance with the values and meanings of students (the statistical weight makes 12 points).

**Table 1: The use of digital technologies by teachers for the creative self-development of pupils**

The trends of digital technology use, accompanied by the creative self-development of pupils	No. of teachers (%)
The organization of joint activities among students concerning the set and solution of problematic cognitive tasks	56
The attraction of cognitive task solution samples	62
The student training concerning goal-setting process, the creation of individual educational programs and routes	76
The monitoring research potential manifestations among schoolchildren, their value systems, the emotional and cognitive components of creative cognitive activity	76

Only 18% of the administration representatives among 22 educational institutions answered positively on the implementation of their possibility to carry out the educational support of productive cognitive activity using digital technologies during the development of individual educational plans and programs by students. At the same time, the focus on the use of such features was revealed among 89% of the respondents.

## **RESULTS AND DISCUSSION**

To improve SMRT for the support of creative self-development among students in the course of the study we revealed and implemented the following pedagogical conditions: an active learning of digital technology opportunities by teachers to implement the information and communication support concerning the creative self-development of students in learning activities; the use of scientific and methodological support materials for creative self-development of students in learning activities; the inclusion of teachers in research activity on the problem of pedagogical support concerning the creative self-development of pupils; the creation of digital media awareness situation for the creative self-development of pupils; the use of diagnostics and self diagnostics concerning the scientific and methodical readiness of teachers to support the creative self-development of pupils; the communicative interaction of educational process subjects to solve the problems of student creative self-development support.

Based on the selected pedagogical conditions and the results of the experimental work in a number of schools in the city of Belgorod, we developed SMRT technology to support the creative self-development of pupils. During the target stage of the educational technology, the self-assessment and the evaluation of SMRT was carried out to support the creative self-development of pupils using the diagnostics developed by the authors. Using test questionnaires we studied the need for achievements; teachers studied the features of their educational activities in a classroom; the conclusions were drawn concerning the results of various psychological state diagnosis. In particular, the level of aggression was revealed; We studied the possibilities of digital technologies, the technologies which provided the support for the creative self-development of students. The attention of scientific and methodological school service at this stage of the work was also aimed at the inclusion of teachers into the remote communication and the training on the issue of pedagogical support concerning the creative self-development of pupils. To

this end, the Web Quest was offered for the teachers on the issue of creative self-development pedagogical support among pupils, the bank of links to remote training courses, as well as the bank of links to the online communities of teachers. At this stage, personal difficulties were determined by teachers, accompanied by the creative self-development of students. The self estimation of orientation was supplied on the implementation of pedagogical support concerning the creative self-development of pupils, including the development using digital technologies.

During the process step the teachers mastered the technique of creative self-development among students in learning activities within collective operation conditions. Working in a group, the teachers chose a specific topic of a lesson, determined its objectives, and developed the ways of digital technology inclusion in the solution of pedagogical support problems concerning the creative self-development of pupils. At this stage, a special attention was paid to the creation of an activist group-the leaders of pedagogical support introduction concerning the creative self-development of students in learning activities, including the use of digital media. The group of leaders played a leading role in the "promotion" of other teachers using the established theme site, open lessons, seminars and master classes.

During the substantive stage of the technology the school teachers were actively involved in the preparation of open classes within the selected thematic unit. The subject of modules reflects an active cognitive activity of a student which performed the stages of his creative self-development such as "The creative self-development of schoolboys in educational planning", "The creative self-development of students in practice-oriented situations", "The creative self-development of students in research activities", "The use of electronic media information during the stages of creative self-development at a cognitive problem solution", "The creative development of students in the conditions of an educational debate". In order to work on a thematic unit the teachers were given (and/or they developed on their own) the guidelines in accordance with the a theme (the recommendations for some content selection, the leading techniques and methods demonstrating a student's and a teacher's activity); the list of personalities to search the electronic resources during the preparation for a lesson and the lists of electronic resources. During the preparation, the implementation and the discussion of open lessons conducted in accordance with the problem specified in the thematic module, the teachers studied the initial state of their scientific and methodological readiness to support the creative self-development of

schoolchildren and its increment in the course of a problem solution. They also evaluated the effectiveness of the student research capacity, the period of a student's development from the moment of his needs for new knowledge to the moment of its satisfaction during a problem solution.

During the reflexive stage of the technology the teachers presented the found techniques and methods of pedagogical support for the creative self-development of pupils at the meetings of the subject sections, the scientific and methodical associations and conferences. During this stage, the methodical school service paid a special attention to the possibilities of a teacher participation in various professional competitions, grant programs which allowed to continue research and interpret the results of pedagogical creativity.

**Summary:** We found that the implementation of pedagogical technology for the development of scientific and methodical readiness of teachers to support the creative self-development of students ensures the creation of a school-based internship site that brings together the efforts of teachers from educational organizations around the neighborhood. The distribution of best practices with the conduct of training seminars, round tables, master classes, open lessons allows teachers to aware fully and thoroughly the strengths and the weaknesses of the innovation, the possibilities of digital tool use to improve the processes of student creative self-development support in learning activities.

### CONCLUSION

The problem of SMRT development for the pedagogical support of creative self-development of pupils is associated with the prevalence of teaching reproductive, explanatory and illustrative techniques in practice against the background of the subject-object relationship between a teacher and a student. The development of SMRT to support the creative self-development of students allows to ensure the effectiveness of the learning process, to reduce the time of higher learning outcome obtaining. The development of pedagogical conditions and SMRT technology development to support the creative self-development of students contributes to the transition of Russian schools

to a new didactic model in which learning is evolved around the issue of a personal development individual trajectory development, to the skills of scientific knowledge active study in terms of novelty and uncertainty, to the experience of cultural creativity and the subject-subject interaction.

### REFERENCES

- Halpern, R., P. Heckman and R. Larson, 2013. Realizing the potential of learning in middle adolescence. <http://www.howyouthlearn.org/pdf/Realizing%20the%20Potential%20of%20Learning%20in%20Middle%20Adolescence.pdf>.
- Kormakova, V.N., 2015. The development of a student personality creative potential in the learning process. *Sci. Res.*, 3: 21-29.
- Larson, R.W., 2011. Positive development in a disorderly world. *J. Res. Adolescence*, 21: 317-334.
- Makotrova, G.V., 2012. Pedagogical technology of Internet use in the individualization of the scientific potential development among high school students. *Innov. Educ.*, 2: 82-93.
- Musaelian, E.N. and V.N. Kormakova, 2014. Self-determination of senior students in the socialization process. Proceedings of the 1st International Conference on Development of Pedagogical Science in Eurasia, August 28, 2014, Vienna, pp: 41-43.
- Noddings, N., 2007. *When School Reform Goes Wrong*. Teachers College Press, New York, ISBN: 9780807748114, pp: 112.
- Seliverstova, E.N., 2014. *Modern School Education: Towards Technological Renewal*. In: Russian Federation Ministry of Education and Science, Seliverstova, E.N. (Ed.). WIT-Print, Vladimir, pp: 56-83.
- Semenov, I.N., 2012. Research and Development of a Person Professional Consciousness Pupils in Higher Education by Reflective Technologies. In: *The Research Approach in Education: The Problem of Teacher Training: Scientific Methodical Collection*, Obukhov, A.S. (Ed.). Vol. 2, MPG, USA., pp: 234-241.
- Vedder-Weiss, D. and D. Fortus, 2011. Adolescents' declining motivation to learn science: Inevitable or not? *J. Res. Sci. Teaching*, 48: 199-216.