

Full-Time School in Russia: Developing Research Capacity in High School Students

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Abstract: The study presents the concept of developing the research potential among high school students in educational establishments, implementing a full-time school model. This model involves the integrated system of school and additional education. Its implementation reflects the renewal of school education in Russia, represented in the new federal state educational standards for secondary (complete) general education in Russia. Findings from the study of methodology of research capacity development of senior pupils in full-time schools and its experimental implementation, including through its digital support are based on the principles of subjectness and subjectivity. The idea of subjectivity has been supported by the conscious choice of seniors in favour of significant progress in education, connecting the culture and psychology of choice with a blend of courses and creating an individual education programme plan. In accordance with the idea of subjectness the students passed a number of successive levels in performing a number of tasks and using some digital resources and technologies during the experiment. Students mastered particular cognitive strategies at the operating activity level, managed the process of obtaining new knowledge in an independent study at the subjective activity level, practiced self-education demonstrating selective and critical reflective attitude to scientific knowledge at the subjective personal level.

Key words: Information and communication technologies, subjectness, subjectivity, seniors, high school students, creative self-development, research capacity

INTRODUCTION

From the standpoint of the new Federal State Educational Standards (FSES) for secondary (complete) general education in Russia the Full-Time Schools (FTS) model provides the opportunity to create a friendly educational environment on the basis of integration of school and additional education. The implementation of the model is intended to reflect the global educational trends and challenges of the times. It will provide educational programmes with effective system of continuous evolutionary content updates in response to cultural and technological changes in the modern world. In other words it will help to overcome the formal “archaic” education within the class-and-lesson system and stop “a new standard” from getting “old”. The FTS model can reduce tendency toward the increase of differences in learning outcomes between the groups of “gifted” and “ordinary” students. It will increase the level of functional literacy of learners and the ability to apply knowledge in practice. The model is aimed to improve and expand the functions and the responsibility of additional

education system in a more efficient way. One of the important objectives is to strengthen and improve the linkages between schools and communities, children’s organizations, children’s culture industry and families in the regions of the country. The implementation of the FTS model is intended to actively use the information and communication technologies and resources to solve particular pedagogical problems.

When launching the full-time school model it is necessary to consider one of the most pressing problems. That is the challenge of the development of research capacity among senior pupils which manifests itself in the following: the willingness and ability of a person to investigate the novelty and complexity of a rapidly changing world; the potential to create and develop new strategies for activities and behavior; the achievement of proficiency and meeting the expected standards within the competency-based learning, education and training system which is apt to change rapidly reflecting the contemporary processes of informatization and globalization in modern society; the ability to effectively handle uncertain situations (Makotrova, 2008).

MATERIALS AND METHODS

The development of solutions to the given problem was part of a regional system experiment “testing the model of educational process organization “the full-time school” within a new FSES generation” in the Belgorod region, covering 4 secondary general schools of the region (MBGEI No 1, 10, 38 in Belgorod and The secondary school with in-depth study of specific subjects in Grayvoron, in Belgorod Oblast). From the perspective of the philosophy of cultural creativity and its role in the social and personality development and within the framework of the study it is important to highlight a number of governing ideas aimed at consolidating achievements and accumulating experience as well as creating new teaching experience in order to develop the research capacity among senior students. The implementation of these ideas is possible within the crafted complex target programmes.

Under experimental conditions, the assessment of the research potential level among senior pupils was conducted by a teacher applying the 4-point marking scale, when describing different dimensions. first dimension or the discourse of the past represents a set of innate and acquired characteristics of a person that appear in the process of an individual’s personality development and serve as a driving force behind its further evolution (Makotrova, 2008). In order to comparatively evaluate the state of the research capacity development of students of a particular class in a particular school the teachers focused on the results of the held ascertaining experiment, showing the distribution of high school students in accordance with the levels of their research potential development (Table 1).

The second dimension or the discourse of the present embodies the research interests and skills required in a particular cognitive (culture creative) situation. The third dimension or the discourse of the future incorporates the personal features and integrative characteristics of student’s abilities which for various reasons were or are unused and will be exploited in

different types of cognitive and research activities in future, providing the appropriate assistance. It can be described as the zone of proximal development.

The monitoring of research capacity development among senior students has been carried out with the help of diagnostic tools and equipment, including the digital ones (Makotrova, 2008), among which may be especially mentioned: the electronic diagnostic system for evaluating the development of the research capacity among senior pupils; the computer testing system for the detection of emotional and cognitive components of cognitive activity; the computer diagnostic modules for determining the senior pupils attitudes ranking in cognitive activity and means of their implementation; e-Models of individualized education programmes; the journals of creative self-development “reflective student portfolios”; the system of computer diagnostics of the teachers’ readiness for the students’ research capacity development.

Monitoring the development of the student’s research potential allows the teacher to understand the development processes at various stages of culture genesis (cultural adaptation, enjoying the cultural benefits, interpretation of culture and cultural creativity); the implicit and explicit relations between the senior research capacity manifestation and the components of basic culture of his or her personality (ethical, environmental, informational, etc.,) the transformation of the learners’ key qualities, characteristics and age peculiarities in the course of research activity development while using the potential of Information and Communication Technologies (ICT) in the acquisition of new knowledge.

Advancement of methodology for research capacity development among senior students within the crafted full-time school model and its experimental implementation, including through its digital support was held on the principles of subjectness and subjectivity. In preparation for the training sessions the teachers used active learning instructional strategies and techniques to build cultural creativity situations in the classroom.

Table 1: “Benchmarks for comparative evaluation of research capacity (RC) development of high school students within the discourse of the past”

Levels of research capacity of school children	Grade points boundaries for the levels of school students in the region from a representative sample	Distribution of high development over the levels of their levels of their RC development (%)
Adaptive level	From 10-22	7
Reproductive level	From 22-28	64
Heuristic level	From 28-34	28
Creative level	From 34-40	1

RESULTS AND DISCUSSION

The concept of research potential of schoolchildren is considered to be a dynamic resource, incorporating a unique set of cultivated natural abilities (intelligence, sensory processing in changing situations, research activity, communication), values and semantic bases of the focus and results of research (in the axiological sense), general knowledge about the Universe, wildlife, society and man, the ability to apply scientific methods to study the world around us. It is actualized to a different extent in the form of student's attitude towards the learning outcomes of research-related activities (the understanding of the self, the understanding of other people and the world), proving the students to be true researchers within the process of guided and successive study. It also provides an effective restructuring of the direction and content of cognitive activity, creative productivity, personal self-determination and creative self-development. The following criteria should be mentioned: research motivation, research (scientific) thinking style, creativity and problem solving. Each of them was measured using a number of features.

The concept of the research capacity development among senior pupils in the integrated target programmes for full-time schools emerges the following ideas presented by the authors: the need for the personalized, eclectic and creative samples of education programmes based on the best pedagogical experience; daily (weekly) schedule and routine planning, representing a chain of individual educational events, including the whole set of educational engagements and interactions between the school and its social partners; the importance of the emotional perception and intelligence of the person in the process of studying; the development of the valuable relation of students to knowledge and its products; the interlocutory aspect of the cognition process; continuous and gradual complication of schoolchildren activities with the transfer to higher levels of development (gradually transforming from the research-led to the research-operating and research-creative attitude); the vitalization of the student's individual activity; the construction of problem solving environment by analogy with the scientific and professional activities and the real life situations; the students' own choice of problematic areas based on their subjective experience and personal reflection; the teacher training programme introducing new methods and techniques; the use of self-discovery mechanisms in order to identify major personal potential opportunities; the combination of diagnosis and self-diagnosis of research capacity in schoolchildren; the development of self-education skills by actively using the

enabling information and communication technologies; the interdisciplinary educational and scientific research, social projects for children, teens and adults in close cooperation with academic institutions, social enterprises and businesses; the creation of family clubs and pedagogical institutions, implementing the programmes of responsible parenthood in order to provide family support to seniors in their research activities; the development of tutorial support systems in schools.

In the context of the present research and in accordance with the requirements of the new FSES the teacher tended to identify the differences in the level of research capacity of learners at key, interdisciplinary and subject levels. At a key level the teacher estimated the research capacity of students on different stages of learning according to their general knowledge, common for all the subjects in the curriculum. At an interdisciplinary level the attention was paid to the integrative knowledge, common for a specific set of subjects. At a subject level the teacher tested the research capacity of students based on the studying of separate subjects.

The concept of subjectivity in the framework of anthropological approach. Provides us with the idea of student making a conscious decision in favour of significant progress in his or her education within the full-time schools model, combining the culture and psychology of choice with a blend of courses and creating an individual education programme plan. For that purpose the students were provided with a wide range of different models of individual educational programmes, including electronic ones. That allowed the learners to study the possible options to make their choices. If necessary, the teacher gave the seniors immediate advisory and operational assistance, pedagogically accompanying their creative self-development.

The concept of subjectness in the framework of cultural and activity approaches allowed the authors to appreciate the role of modern information and communication technologies as available means by which the student acquires the experience of intellectual self-organization and intellectual and personal development which can be characterized by certain levels (operationally effective, activity-oriented and personality-oriented), presented by Seliverstov. Under experimental conditions, at an operationally effective level digital resources and technologies helped the learner practise certain cognitive actions (analysis, synthesis, comparing, classifying, etc). At an activity-oriented level the students are able to manage the process of obtaining new knowledge in their independent studies. A personality oriented level provides the opportunity to

demonstrate axiological, “subjectively selective, reflective semantic attitude to scientific knowledge”, allowing to carry out self-directed learning.

The presented ideas enabled us to develop a set of principles for the activity of school educators and teachers of additional education and training, aimed to manage the processes of research potential and skills development among schoolchildren within the cognitive activity in an open information-educational environment. It is necessary to highlight the following: “problem solving scenarios”, “choice and creative initiative”, “collaboration and cooperation”, “the priority of methods over information”, “research immersion”, “pedagogical support of personal growth, integrative and open content”. Based on the understanding of the course contents as an open educational system, the implementation of these principles has been carried out on the basis of active use of popular science texts, the video data and computer software (Makotrova, 2013).

Within the framework of the study the authors paid special attention to the teacher training programme. The teachers were trained to create cultural and creative educational scenarios (Makotrova, 2013). The developing and introduction of cultural and creative educational scenarios at various stages of culture genesis (cultural adaptation, enjoying the cultural benefits, interpretation of culture and cultural creativity) allowed students to master the cultural creativity technologies and the teacher to implement the ideas of subjectness and subjectivity in the development of research capacity (Makotrova, 2013). Educators directed particular attention to the use of cultural creativity technologies in order to strengthen the close connection between the school and extracurricular activities.

In order to develop the research capacity of senior students we also tried to actively involve the powerful resources of different educational websites which contain huge collection of learning and teaching materials for Natural Sciences and Humanities Research (Kurek, 2006). Being provided with a high-speed Internet access on the territory of the experimental schools, we have created special conditions for the use of interactive technologies. In order to increase the participation of schoolchildren in the research projects (including international ones) we have created different web-quests (March, 2007). Within the framework of the study we enjoyed the opportunity to involve students of the whole class, clubs and societies, groups of schoolchildren, family teams and even homeschooled learners in “hands-on” project work. Results of the research work were often published on the school websites. They may be used as additional digital (media) content in Natural Science courses and as an

auxiliary teaching material for separate topics or lesson planning which also prove the strong connection between the school and extracurricular activities (Lambright, 2008).

The research projects assigned on homework to teams and groups of students proved to be challenging and extremely successful in the practice of experimental school work, promoting a collaborative atmosphere, positive team spirit and the use of distance education resources (Saam and Jeong, 2013). To improve the effectiveness of the research capacity of schoolchildren nowadays the implementation of the project work is supported by partner schools. They work in close cooperation organising the Bank of creative homework assignments in different subjects. Part of the projects are presented online and will later be used by the students to select their content, level of difficulty, form (in different subject clubs and sections, remotely, at home) (Makotrova, 2013).

Within the research particular attention was given to the accumulation of electronic database including the links to different educational Internet resources in order to provide extracurricular activities for high school students (Selcher, 2005). Its use allowed students to enjoy the research and creative environment, providing personalized specimens of scientific creativity. The schoolchildren can learn techniques and strategies to fine-tune their online research skills from the textbook “the internet for the student-researcher” (G. Makotrova).

The Olympiad movement programme in the experimental schools was launched and maintained under the constant informational support of representatives of different scientific schools, for example, the school of heuristic education (A. Khutorskoy) and the school of developing training (V. Davydov, D. Ehlkonin) as well as the support of the Head and representatives of the Interschool Competition and Olympiad movement.

Within this project the teachers of experimental schools were provided with additional training highlighting the methods for ensuring better learning outcomes and meta-subjects results corresponding to a number of indicators for the research capacity level among high school students. The teacher development programme involved a combination of face to face teacher training with technology enhanced support and back-up. To provide the school teachers with e-Tools and Internet techniques and to ensure their effective use within the process of research capacity development among high school students, a special teacher hub was created as a section of the site of Belgorod National Research University (<http://school.bsu.edu.ru>). Educators, tutors and teachers can get up-to-date news, announcements, resources and more for their classroom. It also provides a

list of useful links that can be used to plan a number of extracurricular activities, motivating schoolchildren to participate in the project and research activities.

CONCLUSION

The full-time school model is a new challenging and successful option for senior students with a greater focus on improving teaching. And even today the FTS educators can effectively develop the research capacity of high school learners, despite the fact that the new standard is fully realized only in primary and secondary schools.

The first results of the presented experimental work suggest that the methodology of the new Federal state educational standard and its requirements to the outcomes on students' academic development, enable the introduction of the full-time school model as a successful educational system, designed to increase the students' subjectness.

It should be noted that modern digital technologies in close connection with the school and extracurricular activities provide the opportunity to successfully implement the ideas of subjectivity and subjectness in the full-time schools to promote self-determination and intellectual self-actualization among high school students in the process of education.

Having thoroughly examined the development processes of the components of research capacity among senior students in experimental schools, it is necessary to

highlight higher rates of advancement and development in comparison with similar rates in other schools of the region.

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