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Teaching Model of Pupils' Research Competence Formation in the Context of Humanitarian Subject-oriented Classes of General Education School: Functional and Organizational Characteristics

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Abstract

Functional and organizational characteristics of teaching model of pupils' research competence formation in the context of humanitarian subject-oriented classes of general education schools are taken into consideration. The research activity aimed at increasing the educational process quality in general education school is one of the productive ways of pupils' research competence formation. The functional and organizational characteristics of proposed teaching model include *the conditions* of research and development environment organization (such as system of methods, stages and forms of research activity organization, interconnection of school and higher education institution, integration of both curriculum and extra curriculum forms of education, pedagogic personnel work at formation of research competence of pupils of humanitarian subjects-oriented classes and research competence of teaching and researching staff), functioning of *research and development environment*, *levels* of research competence formation of pupils of humanitarian subjects-oriented classes (low, average, high).

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1. Introduction

Changing requirements of the modern school education to organization and planning of education process, different types of research activity that naturally cooperate with the whole set of educational tasks, make the formation of the research competence of pupils actual. In order to solve successfully the teaching task of research competence formation in pupils of humanitarian subject-oriented classes of general education schools, one should develop the teaching model.

The purpose of the research is the consideration of functional and organizational characteristics of teaching model of research competence formation in pupils of humanitarian subject-oriented classes of general education schools.

2. Literature review

Some aspects of formation and development of research competence were developed in works of a number of Russian researchers. So, didactic possibilities of educational subjects and methods of their realization in formation aspect of research competence formation of senior grade pupils of subject-oriented school were revealed in works of Krivenko (2006), theoretical basis (teaching conditions, stages and principles) of development of research competence in pupils in conditions of subject-oriented education was explained by Ushakov (2008); technology of senior grade pupils research competence formation on basis of problem and personality-oriented approach was formulated by Fedotova (2010), methods of research competence formation of pupils in the sphere of mathematics at cooperation between the school and higher education institution were proposed by Forkunova (2010), the process of research competence development of pupils by means of history and ancestry local history in the system of additional education was considered by Aleksandrova (2011).

However, a number of problems connected with research competence formation of pupils of humanitarian subject-oriented classes of general education school is still unsolved. Therefore, still the peculiarities of formation of research competence of pupils in subject-oriented education are not defined; the structural composition of the mentioned research competence is not determined; teaching model of competence formation of pupils of humanitarian subject-oriented classes of general education school is missing. Therefore, both actuality and the level of the problem consideration show the necessity of development of such teaching model of competence formation of pupils of humanitarian subject-oriented classes of general education school.

3. Basic assumptions

As research competence of pupils of humanitarian subject-oriented classes, we understand the integrative personality quality supposing readiness and ability to productive research activity in the sphere of humanitarian sciences. The essence of research competence of pupils of humanitarian subject-oriented classes is revealed by the sum of personal, cognitive and active components. Groups of corresponding competencies represent the given components: personality-oriented competencies; cognitive emphasized competencies and activity emphasized competencies (Kazarina, 2015).

Research competence of pupils of humanitarian subject-oriented classes (further pupils) is formed in process of research activity within teaching model. The structure of the proposed teaching model is represented by structural and system, as well as functional and organizational characteristics. In this paper, we consider functional and organizational characteristics of teaching model of research competence formation of pupils of humanitarian subject-oriented classes of general education school.

4. Methodology

In accordance with the set goal, methodological base includes both theoretical (analysis of pedagogic and psychology literature, theses on studied problem, modelling, comparison and generalization) and empirical (study of activity and documents, expert evaluation method) methods widely used in pedagogic research.

Functional and organizational characteristics of the proposed teaching model should include conditions of research and developing environment organization, functioning of research developing environment, levels of

research competence formation of pupils.

A. Conditions of research developing environment organization.

Taking into consideration approaches to research environment formation, formulated by Ushakov (2008) and other authors, let us consider the conditions of research and developing environment formation in general education school: 1) consistency of methods, stages and forms of pupils research activity organization, 2) interconnection between the school and higher education institution, 3) integration of curriculum and extra curriculum education forms, 4) teaching staff work at formation of research competence of pupils 5) research competence of teachers and researchers.

Teachers and heads of educational institution create the above-mentioned environment (act as educational cooperation subjects); pupils also actively take part in it. The cooperation between them and teachers is aimed at result – formation of research competence of pupils of humanitarian subject-oriented classes.

1. Consistency of methods, stages and forms of pupil's research activity organization. Consistency is a condition of organization and functioning of research and developing environment and it is reached by the unity, interconnection and mutual relation of methods, stages of pupil's research activity formation, as well as forms of research activity of pupils.

2. Higher education institutions are interested not only in attaching pupils and student to research projects, but also in being the center of research activity for senior grade pupils. It is an educational strategy supposing realization of combination of teaching conditions – forms, methods, approaches, means and mechanisms providing participation (familiarization, orientation and conscientious participation) of personality in different types of activity (Andrienko, 2001).

Organization of research activity of senior grade pupils is possible on basis of existing laboratories in higher education institutions having sufficient research base and highly qualified scientific and teaching staff. Successful activity in this direction is based on organization of constant education integrating educational system school-institution and preserving continuity on all education stages.

Institution has sufficient material and technical base, unique complex of modern equipment providing conduction of a wide range of researches in prioritized directions of development, scientific staff conducting leading researches and scientific and technical library. For humanitarian subjects, namely foreign languages learning, in higher education institutions resource centers are created. It such centers student can use library, educational electronic platforms, information technologies etc. Scientific and technical library provides book resources, as well as convenient services aimed at quick necessary information retrieval.

Cooperation between general education school and higher education institution is represented in provision of scientific base of the higher education institution to pupils for conducting research work; participation of university teachers in preparation of pupils for participation in contests and Olympiads; assistance of university teachers in scientific projects of pupils and their further presentation on scientific and practical conferences; carrying out of subject-oriented Olympiads, seminars, scientific and practical conferences for pupils of general education schools on higher education institution basis.

Carrying out of the given activities allows forming integrated view on scientific knowledge, broadening scientific outlook and stimulating research activity motivation at pupils. Because of such cooperation, the level of pupils' research activity increases. It results in their active participation in different activities. Certificates and diplomas for best conference report are considered as the indicators of high reached level.

3. Integration of curriculum and extra curriculum forms of education. Extra curriculum education form is one of the effective means of both development of pupil's personality and formation of research activity motivation.

One of the productive mechanisms of educational activity of pupils is their activity. At organization of process of forming the research competence, it is appropriate to use such forms of education that allow maximum involvement of pupils' personalities, broadening their outlook and providing harmonic and correct pupils' personality development.

Integration of curriculum and extra curriculum education forms at formation of research competence requires the presence of teaching activity program of pupils' research competence formation taking into account integration of curriculum and extra curriculum education forms. In order to fulfill curriculum form of education, it would be more efficient to use elective courses; for realization of extra curriculum education form, it would be more productive to use such education forms as creative group work, problem-oriented creative work and conferences.

In the course of extra curriculum activities, pupils study in a relaxing heuristic environment humanitarian subjects and learn to actively cooperate with each other, acquire cooperation skills in conditions of research and

developing environment. Therefore, extra curriculum work is one of the prioritized directions of teaching staff activity in general education schools.

4. Teaching staff work at formation of research competence of pupils.

Regular basis of this condition is the necessity of formation of teaching staff of general education schools that could provide involvement of pupils into research activity for formation of their research competence.

Realization of this condition is determined by the availability of teaching staff with knowledge and necessary skills for setting and solving research tasks in their professional activity; holding reflexive teaching seminar allowing school teachers developing the research activity concept and modelling teaching program for formation of research competence of pupils; determining the list of research competencies of pupils as a basis of pupils research competence; definition of methods and forms of work of teaching staff aimed at realization of research activity of pupils; planning work of every teacher; conducting final teaching evaluation and interpretation of its results; long-term monitoring of professional and educational trajectory of the graduate.

5. Research competence of teachers and researchers.

Not every teacher is capable of forming pupils' research competence even if he or she possesses the method of sequential adaptation of pupils to conducting research. Teachers have serious difficulties at organization of their research activity since they are not ready to shift focus from usual professional activity (Smishlyaeva, et al., 2007).

Nowadays we should have in mind a teacher with professional culture where such personality traits and qualities prevail as specific cognition (combination of knowledge and notions necessary for a teacher for setting and solving research tasks in professional activity); creative activity; system of values; motivation (supposing interest in research activity aimed at development and realization of research tasks, projects with pupils, cooperative participation in contests, conferences, seminars etc.). Therefore, there is need of new teacher-research supervisor profession model. It could be made from teacher's professionalism with possession of psychology and teaching methods of work with pupils, and a scientist as a carrier of activity standards and values of scientific society (Smishlyaeva, et al., 2007).

In order to provide the quality of educational process, the problem of teaching staff qualification, their personal and professional qualities, becomes especially actual. The following activities may be effectively used to improve professional competencies of teachers from general education schools: grant projects; trainings; further education; development of new courses and educational methodic complexes; participation of teachers in higher education institution conferences, contests and seminars.

B. Research developing environment.

Research developing environment is a pedagogically organized environment where research activity of pupils is stimulated and developed, and where all conditions and possibilities for their research competence formation are provided.

Usahkov (2008) notes that creation of research developing environment in general education school allows pupils choosing on their own both the topics of research, and the difficulty level, form and methods of work. It also provides realization of individual interests of pupils and allows using evaluation systems adequate to the required educational results.

The determining component of research developing environment is the unique partnership relation and creative cooperation, cooperative scientific search and business communication between teachers and pupils aimed at development and self-development of personality, partnership relation in created research collectives in all organizational forms. The given relationship creates conditions for free choice of activity aimed at realization of actual necessities and interests of personality, research activity in particular.

Communication with scientific advisor, classmates and teachers carrying out scientific research in the given institution, cooperative solution of research tasks activate pupils' activity. The atmosphere of scientific creativity in general education school creates conditions for acquiring by the pupils of research experience. In addition, one can see the contribution of every teacher to the development of creative skills of pupils since this environment is actual for both pupils and teachers (Kikot, 2002).

Consequently, research competencies may be formed both by conditions of research developing environment determined by the direction of scientific research, and by partnership relations and creative cooperation, cooperative scientific search and business communication between teachers and pupils, microclimate created in research developing environment.

Research developing environment is promoted by a variety of methods and technologies developed by teachers-researchers collective in accordance with individual peculiarities of pupils, orientation on renewal of teaching activity and forms of work, ambition to improvement of personal and professional qualities.

Research developing environment realizes environmental approach and represents compositionally organized combination of stages and methods of formation of research activity of pupils.

Significant functional characteristics of teaching model is the level of considered research competencies formation that is considered as its qualitative parameter and result. Levels reflect the extent of increase of research competence of pupils.

Evaluation of research competence formation level in accordance to its focus is performed on basis of level scale developed by Smishlyaeva (2011): 3 points – high level of competence formation; 2 points – average level; 1 point – low level; 0 points – lack of competence.

High level supposes stable results obtaining in research activity and therefore formed research competencies. *Average level* reflects situational obtaining of high results in research activity and relatively fully formed research competencies with insignificant deficiencies of operational character (performance of actions). *Low level* shows frequent and constant significant difficulties for pupils in research activity at inadequately formed research competence.

Basing on the analysis of research competencies formation level, the overall level of research competence formation level of pupils of humanitarian subjects-oriented classes is determined.

5. Data Analysis

In order to evaluate the effect of the developed teaching model of research competence formation of pupils, the criteria and efficiency indicators were determined in the course of experimental test.

The research was conducted using the results of teaching pupils of 10-11 grade of humanitarian subjects oriented classes of municipal autonomous general education institution «Tomsk secondary school № 30» for the period from 2011–2014. The results of teaching in test group (TG) and control group (CG) are compared in accordance with all determined criteria and efficiency indicators of teaching model of research competence formation.

The results of experimental test of the proposed teaching model show the efficiency of the developed model of research competence formation of pupils of humanitarian subjects oriented classes of general education school.

6. Conclusion

The considered functional and organizational characteristics of teaching model (conditions of research developing environment organization, functioning of research developing environment, levels of research competence formation) are interconnected and allow to obtain the view of internal organization (structure) of the teaching model. The developed teaching model broadens the view on process of research competence formation of pupils of humanitarian subject-oriented classes of general education school, as well as reveals its trajectory of development.

References

Aleksandrova, N. A. (2011). *Razvitie issledovatel'skikh kompetentsiy uchashchikhsya sredstvami istoriko-rodoslovnogo kraevedeniya* [Development of research competence of pupils in conditions of local history subject-oriented education. Thesis abstract]. Moskow: ISP RAO.

Andrienko, A. V. (2001). *Priobshchenie uchashchikhsya litseya k nauchno-issledovatel'skoy deyatel'nosti* [Involvement of lyceum pupils in scientific and research activity. Tesis abstract]. Krasnoyarsk: SGTU.

Fedotova, N. A. (2010). *Razvitie issledovatel'skoy kompetentnosti starsheklassnikov v usloviyakh profil'nogo obucheniya* [Development of research competence of pupils of general education school in conditions of subject-oriented education. Thesis abstract]. Ulan-Ude: BGU.

Forkunova, L. V. (2010). *Metodika formirovaniya issledovatel'skoy kompetentnosti shkol'nikov v oblasti prilozheniya matematiki pri vzaimodeystvii shkoly i vuza* [Methods of formation of research competence of pupils in the sphere of mathematics at cooperation between the school and higher education institution. Thesis abstract]. Orel: OGU.

Kazarina, L. A. (2015). Pedagogicheskaya model' formirovaniya issledovatel'skoy kompetentnosti uchashchikhsya profil'nykh gumanitarnykh klassov: strukturno-sistemnye kharakteristiki [Teaching model of research competence formation of pupils of humanitarian subjects-oriented classes: structural and system characteristics]. *Sovremennye problemy nauki i obrazovaniya* [Contemporary problems of science and education]. http://www.science-education.ru/121-r17776.

Kikot, E. N. (2002). *Teoreticheskie osnovy razvitiya issledovatel'skoy deyatel'nosti uchashchikhsya v uchebnom komplekse "litsey-vuz"* [Theoretical basis of research activity development of pupils in educational complex lyceum-higher educational institution. Thesis abstract]. Kaliningrad: BGARF.

Krivenko, Ya. V. (2006). *Formirovanie issledovatel'skoy kompetentnosti starsheklassnikov v usloviyakh profil'noy shkoly kraevedeniya* [Formation of research competence of senior grade pupils in conditions of local history subject orientatioню Thesis abstract]. Omsk: OGPU.

Smyshlyaeva, L. G. (2011). *Didakticheskaya kontseptsiya modernizatsii dopolnitel'nogo professional'nogo obrazovaniya munitsipal'nykh sluzhashchikh v Rossii* [Didactic conception of modernization of vocational professional education of municipal workers]. Tomsk: Izd-vo Tom. Un-ta.

Smyshlyaeva, L. G., et al. (2007). Metodologiya i metody pedagogicheskikh issledovaniy: Uchebno-metodicheskiy kompleks [Methodology and methods of pedagogic research: teaching and methodic complex. Thesis abstract]. Tomsk: TGPU.

Ushakov, A. A. (2008). *Razvitie issledovatel'skoy kompetentnosti uchashchikhsya obshcheobrazovatel'noy shkoly v usloviyakh profil'nogo obucheniya* [Development of research competence of pupils of general education school in conditions of subject-oriented education. Thesis abstract]. Maykop: AGU.