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Formation and Development of the System of Metasubject and Oversubject Concepts in the Structure of the Person's Cognitive Experience within General Geographic Education

Abstract

The article deals with the problems arising within transition from the traditional to the modern educational paradigm. Taking the use of school geography textbooks and teachers' guides as examples the author offers innovative technology for the development of student's personality cognitive experience implemented due to the combination of domain-specific and reflexive components of the lesson. The greatest attention is paid to the development of interdisciplinary and metasubject concepts on the basis of the activity approach and visualization of the studied educational content. It allows providing individual learning outcomes in accordance with the requirements of the educational standards for general education.

Keywords: activity approach, individual's cognitive experience, interdisciplinary concepts, metasubject concepts, metasubject and personal educational outcomes

Introduction

Modern Russian education faces a change of educational paradigms. As a basis for the transition from the traditional to the system-activity and person-centered educational paradigm served new pedagogical ideas about educational organisations' functioning, educational content and its structure, ways of achieving educational outcomes required by the federal state educational standards of primary, basic general and secondary education (FSES PE, FSES BGE, FSES SE) (Ob utverzhdenii i vvedenii v dejstvie federal'nogo gosudarstvennogo obrazovatel'nogo standarta nachal'nogo obshhego obrazovanij, 2009; Ob utverzhdenii federal'nogo gosudarstvennogo obrazovatel'nogo standarta osnovnogo obshhego obrazovanija, 2010; Ob utverzhdenii federal'nogo gosudarstvennogo obrazovatel'nogo standarta srednego obshhego obrazovanija, 2012).

In traditional pedagogy, educational content was determined by the priority of the learning process and formation of the system of knowledge, abilities and skills, attitudes and beliefs. But already in the 1970's – 1980's new pedagogical theories appear; they treat educational content not from the point of the knowledge value, abilities and skills alienated from the student's personality but from the point of person-centered approach proclaiming the learner as a value.

In recent years student-centered approach implementation to the definition of the educational content enabled to consider the person but not the knowledge aloofed from the person as an absolute value. This approach is reflected in the works of I. Ja. Lerner, V. V. Kraevskij and M. N. Skatkin who identified the following components in the educational content:

- 1) pedagogically adapted system of knowledge about nature, society, man;
- 2) activity experience on the known methods or samples;

- 3) creative activity experience;
- 4) students' experience of emotionally-valuable relations to the studied objects and reality, other people, oneself and activity (Kraevskij & Lerner, 1980).

This new approach, according to the authors of the concept of modern education, allows guaranteeing the formation of fully developed personality capable to learn and develop material and spiritual societal culture.

Modern pedagogical science determines the following components in the educational content: individual's cognitive experience; practical experience; creative activity experience; experience of relations (Pedagogika, 2013; Podlasyj, 2011; Slastenin i dr., 2002; Pedagogika: pedagogicheskie teorii, sistemy, tehnologii, 2001).

The system of concepts in the structure of person's cognitive experience

The system of knowledge about nature, society, thinking, techniques and activity strategies are referred by the teachers-scientists to the cognitive experience of the person. Formation of the individual's cognitive experience is characterised by the presence of the system of: 1) concepts, terms, facts; 2) knowledge of the basic scientific laws; 3) knowledge of the theories and concepts; 4) knowledge of the ways of activities, cognition methods and history of learning; 5) evaluation knowledge, knowledge of the relationship rules to various life phenomena established in the society (Pedagogika: pedagogicheskie teorii, sistemy, tehnologii, 2001).

During the formation of person's cognitive experience the concepts perform a backbone function as only at this basis the scientific laws and theories, knowledge about the ways of activities and normative-evaluation knowledge may be perceived. Besides that the system of concepts being developed during the process of learning corresponds to the multi-level formation process of the educational content. The model of educational content formation developed by V. V. Kraevskij and I. Ja. Lerner (1980) contains five following levels.

1. The level of general theoretical views where the content appears as a generalized representation about the content of the social experience in its pedagogical interpretation transmitted to the younger generations.
2. The level of the subject where the idea about a particular piece of content having specific functions in general education is developed.
3. The level of the educational material where concrete, recommended for the study and fixed in the textbooks, study guides, books of tasks etc. content elements (knowledge, types of activities) belonging to a particular course of study of a certain academic subject are represented.
4. The level of pedagogical reality where the projected educational content becomes the content of the joint activities – teaching and learning.
5. The level where the projected content becomes the property of each individual student, a part of his/her personality structure (Kraevskij & Lerner, 1980, p. 36).

Not only the substantial characteristics of person's cognitive experience but also its level hierarchy are reflected in modern legal educational documents (FSES). Correlation of the levels of educational content formation given above with the requirements of the FSES to the study outcomes within basic educational program (BEP) – personal, metasubject and subject – allows making the following scheme of

their compliance: the level (where the subject and teaching material containing specific elements of the content composition) correlates with the educational outcomes of the relevant subject; the level (where general theoretical content presentation in the form of generalized ideas about social experience) matches metasubject educational outcomes; educational level of reality (where the projected educational content becomes the content of joint activities in the process of teaching and learning) corresponds to the metasubject educational outcomes; the level (where the projected content becomes the property of each individual student, a part of his/her personality structure) corresponds to the personal educational outcomes.

Thus, within cognitive experience formation the person perceives the hierarchical system of concepts carried out on the basis of summarizing the content during educational activity.

At the subject level general concepts for certain academic disciplines corresponding to the objective requirements of the FSES are formed (Ob utverzhdenii i vvedenii v dejstvie federal'nogo gosudarstvennogo obrazovatel'nogo standarta nachal'nogo obshhego obrazovaniy, 2009; Ob utverzhdenii federal'nogo gosudarstvennogo obrazovatel'nogo standarta osnovnogo obshhego obrazovaniya, 2010; Ob utverzhdenii federal'nogo gosudarstvennogo obrazovatel'nogo standarta srednego obshhego obrazovaniya, 2012).

For example, within the study of the basic geography course (5-6 grades), the students begin to form general concepts of geographical objects and their material composition, geographical processes, geographical methods of studying the world, geography of the home country and geography of our planet, geographical space and geological time.

General concepts represented in the content of the individual disciplines, continue to be synthesized at the metasubject level becoming interdisciplinary concepts. So, 5-6 grade students begin to develop interdisciplinary concepts of "substance", "life", "method", "model", "my country" etc. at the lessons of biology, geography and mathematics. Formation of interdisciplinary concepts can be carried out directly at the classes on certain subjects where special time should be allocated for reflexive students' activity or at special classes directed at the formation of metasubject outcomes (interdisciplinary concepts and universal educational activities) where the reflective activity of students constitutes the main content of the class.

In the process of usage and generalization of general subject and interdisciplinary concepts the students gradually form oversubject concepts as a cognitive component of personal educational outcomes. It is clear that oversubject concepts like interdisciplinary concepts are formed not only in the process of school students' activities but also at extracurricular classes or classes focusing at their upbringing.

Oversubject concepts can reach categoric level, i.e. become the concepts of the highest generalization level. Oversubject concepts (categories) can be distributed into five groups on the basis of the social significance criterion:

- space-time group of concepts;
- a group of concepts about scientific picture of the world;
- a group of concepts about man and society;
- a group of concepts about man and nature;

- a group of concepts about art picture of the world.

Oversubject concepts are necessary for the students to create a general picture of the world and carry out training (cognitive and practical) activities for the development of the scientific worldview.

Organization of the formation and development of interdisciplinary and oversubject concepts in the classroom and within extracurricular activities

During transition to the modern educational paradigm the teachers should master the methods of formation and development of new educational outcomes defined in the FSES and apply them in their pedagogical practice (Ob utverzhdenii i vvedenii v dejstvie federal'nogo gosudarstvennogo obrazovatel'nogo standarta nachal'nogo obshhego obrazovaniya, 2009; Ob utverzhdenii federal'nogo gosudarstvennogo obrazovatel'nogo standarta osnovnogo obshhego obrazovaniya, 2010; Ob utverzhdenii federal'nogo gosudarstvennogo obrazovatel'nogo standarta srednego obshhego obrazovaniya, 2012).

Educational technology development aiming to achieve subject, metasubject and personal outcomes in the classroom and extracurricular work is explained by the necessity to assist the teaching staff in the formation and development of the interdisciplinary and oversubject concepts.

The general idea of the proposed variant of formation of interdisciplinary and oversubject concepts and universal educational actions (UEA) is a combination of subject and reflective components interconnected by the content of school and extracurricular activities. In addition, subject and reflexive components should be implemented on the basis of the activity approach and visualization of the studied content that corresponds to the principles of the FSES.

The attempt to use general theoretical approaches to the formation of the hierarchy of concepts and UEA being the core of the student's personal cognitive experience is represented in the textbooks and methodical manual in basic course of geography (5-6 grades) (Letyagin, 2015a; Letyagin, 2015b; Letyagin, 2015c).

The textbooks in basic course of geography attract special attention to the questions of formation of metasubject and personal educational outcomes. General subject concepts are highlighted on the pages of the textbook and additionally given in the inserted frame. At geography classes the students are offered to recollect if these concepts were used at the classes in other disciplines.

For example, intersubject notion "model" is formed and developed at geography, computer science and ICT and mathematics classes starting from the 5th grade, although the working experience with the first models (more often ready-made) is formed by pre-school and elementary school students. At geography classes in the 5th grade the students have the opportunity not only to work with ready-made models but also to create a model with their own hands as well as independently simulate the processes studied.

Thus, students using the gnomon model determine the direction of the major side of the horizon (north – south, east – west). When measuring the lengths of the equator on the globe and the great circle (two opposite meridians); the students are convinced that the globe is the most correct model of the Earth. Working with the

model “Earth – Moon – Sun” allows a fifth grader visualising, i.e. making clear the process of the earth's motion on the near-solar orbit. When studying the internal structure of the “solid” earth the students are asked to create a model of the world using plasticine.

Introduction of the observation method (subject geography outcome) at the geography class may serve as an example of the gradual formation of the subject, metasubject and personal educational outcomes. In the future the students will learn other methods (mapping, expedition, remote sensing of the earth etc.), form intersubject notion “method” (metasubject outcome) and regulatory UEA. They will be able to “define the purpose of the observation”, “make the plan of the observation”, “determine the degree of the achievement as a result of the observation” (metasubject result). The schoolchildren gradually form and develop a personal quality – “observation” (personal outcome), i.e. used by the man in everyday life and in professional activities.

Methodical guidelines in the basic geography course are constructed in such a way that after each stage or phase of the lesson there is an option allowing short reflection on the learning outcome or the learning process itself (Letyagin, 2015c).

At two classes on the theme “What is the earth’s crust” fifth-grade students study the material composition of the upper shell of “solid earth” – minerals and rocks. Later when studying geosphere the students expand their notion of geosphere (atmosphere consists of a mixture of gases – air, hydrosphere is composed of water, biosphere consists of living substance) and deepen (substances have states of aggregation and specific properties) it. Formed general concept of “material composition of geospheres” (subject outcome) can be the basis for the development of interdisciplinary concept of “substance” (metasubject outcome) and a group of oversubject concepts of “scientific picture of the world” (personal outcome).

It is obvious that interdisciplinary and oversubject concepts’ formation occurs within educational process and with the help of subject skills and universal educational actions.

Open classes in geography conducted by the author in many Russian regions and presence at colleagues’ geography classes showed that inclusion of reflection phases into the class content allows students perceiving geographic information more consciously and assures in the practical significance of geographical education for everyone.

Conclusion

Experience in compiling content and conducting classes at school based on the combination of subject and reflexive components shows that on this basis it is possible to form not only subject educational outcomes but also cognitive experience of the individual students represented in the form of interdisciplinary and oversubject concepts. The main feature of the proposed approach is in constant alternation of the stages of subject teaching and reflection of the outcomes being carried out on the basis of the activity approach and visualization of the studied academic content.

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