



Semantic Aspect of Methodical Training of Faculty Members (Recursive Model)

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ABSTRACT

Components of methodical training of faculty members at higher education institutions, determining efficiency of using pedagogical technologies, are investigated in this paper. The author studies semantic aspect of methodical training of faculty members at higher educational institutions - the competency to organize student work on making sense of studied conceptions and texts. We substantiate from psychological and pedagogical perspective that semantic analysis is basic for faculty members to carry out different kinds of professional activity. Based on methodological analysis, learning actions composing the essence of semantic analysis are revealed: Establishing relations in studied material like juxtaposing scope and content of conceptions, reflecting the sense (conception) and the meaning (denotation) of names of conceptions. Combination of those actions represents the essence of understanding process while working with educational text. Examples from mathematics course, demonstrating the distinguishing features of semantic analysis, are given. The author offers the technology of training in shaping skills in making semantic text analysis in recursive model of methodical training, built in accordance with cyclic principle. Every cycle of the technology includes methodologic, information and training stage of shaping skills in making semantic text analysis. Recursive technology use in shaping methodical competency of faculty member will make possible to boost solving topical problems of Russian higher education system.

Keywords: Making Sense in Educational Cognition, Hermeneutic Trend in Education, Educational Text, Semantics of Educational Text

JEL Classifications: I230, J820, B410

1. INTRODUCTION

1.1. Some Aspects of the Current Situation in the Russian System of Higher Education

Methodical competency has not been paid proper attention while training faculty members in Russia for a long time. The knowledge of discipline was considered to be sufficient for teaching it. Practice has demonstrated that it is not quite true. Existing teaching techniques used by faculty members in Russia do not ensure graduates' readiness for rapid advance of new equipment and technologies. Approaches to teaching need to be changed. Only faculty member having certain knowledge of teaching techniques is able to solve this problem. Therefore, some new characteristics of Russian system of higher education emerged:

- Competency-oriented format of federal educational standards of the third generation,

- Postgraduate education was attributed to the level of higher education,
- Flexibility of normative acts in terms of using educational technologies (e-learning and distance-learning, dual education and so on).

All the characteristics suggest the development of methodical competency in faculty members enabling them to solve vital problems of improving the quality of university education.

The system of pedagogical technologies have been developed in theory and practice of higher professional education; the use of these technologies ensures achieving acceptable learning outcomes. At the same time, educational studies do not deny the impact of subjective factor on faculty members' efforts to organize the teaching process: The same pedagogical technology used by different faculty members sometimes means providing

educational quality at different levels. Therefore, it is important to determine the core of faculty members' methodical competency, whose presence will make it possible to accelerate the application of educational technologies.

1.2. Making Sense as the Basic Characteristic of the Quality of Absorbing Material in Educational Cognition

As a rule, the degree to which students make sense of learning material determines the quality of absorbing it for any discipline (the body of concepts of a particular subject). That's why, didactics considers the process of making sense to be a main component of knowledge absorption process (Zagvyazinsky, 2001). Higher educational studies recognize that methodology of students' cognitive-learning activity in knowledge absorption process is akin to the methodology of studied discipline. That is why, if one focuses teaching on learning method connected with the type of studied science, the model of education has an emphasis on transmission of accumulated information, meanwhile, it focuses on methods of particular branch of science in its cognitive aspect. Some scholars consider this model of education rational. If one sees education as the form of culture, the model of education is different – culture-creative one (Valitskaya, 1998). Modern education is in “transit state” from rational to culture-creative model, in which “education not only consumes and transmits knowledge, but also generates human ability to its reproduce it in forms of cultural practice” (Valitskaya 1998, 22). In other words, the modern process of learning at higher educational institutions is necessary to organize so that learning is based not only on methods of rational model, but on methods of culture-creative model as well. The necessity to combine methods of cognition, firstly, creates new disciplines in the system of education integrating two above-mentioned methods of cognition. The second consequence of combined methodology of cognition is referred to as hermeneutic trend in education which involves the view of perceiving text as the part of “it belonging to some complete whole, as a document for cognizing wider historic-cultural interconnection” (Zapesotsky, 2002, 67). According to it, mastering the basics of understanding is regarded as the primary condition for development of holistic worldview integrating nature, man, and culture. Consequently, methodical training of modern faculty member must involve aspects making it possible to learn material with emphasis on making sense of it. Here, making sense is worth being regarded as the process (organisation of learning activity) and the outcome (the quality of material absorption).

2. MATERIALS AND METHODS

2.1. Making Sense in Educational Cognition

In respect of any discipline taught at institutions of higher education, one can speak of two kinds of making sense: Rational (understanding-explanation) and hermeneutic (making sense - interpretation). Rational understanding is prioritized in traditional approach to teaching. However, in current systems of education we “work with the text” (there are texts in textbooks, lecture notes, lectures delivered orally, online resources and so on). Consequently, it is important in terms of methodology of cognition in learning activity to make sense of text (even within the block

of natural science disciplines where “explanatory” methodology is prioritized).

According to methodology, there are three levels of understanding text (Brudny, 1998):

- Building-up level corresponding to the parameter of establishing relation, transition from one complete element of text to another, located after it;
- Recent ring level corresponding to the parameter of determining of important relation, transition of ideal centre of the situation from one element to another, which allows intermittent motion;
- Shaping general sense level corresponding to the parameter of constructing whole.

The constructed wholeness (holistic knowledge) is a property of the highest level of understanding. The way to holistic knowledge goes through building-up and recentring. Consequently, the following sequence of actions is necessary for making sense: To establish relation - to assess its importance - to construct holistic knowledge on its basis. That is why; training techniques must take into consideration hermeneutic aspects of cognition process. One of such aspects implies the process of understanding in its psychological sense, which means finding relations within the studied object. Here, not all the relations are meant, but rather those, which help make sense of studied material. Thus, one of key concepts defining the interpretation of understanding in learning is that of sense with regard to linguistic expressions.

2.2. Semantic Interpretation of Sense Concept

Frege who investigated relations between linguistic expressions, defined that proper names have two meanings: Referent and sense (Frege, 1997). The referent (denotation or just “meaning”) - is a definite object which is designated by this name. The name also has another meaning - indirect one, involving its objective content, designated as sense (conception). Church had analogous opinion: “Sense (conception) is a postulated abstract object with certain postulated properties” (Church, 1960, 343).

As students learn fundamentals of branches of sciences at higher education institutions, it is rational to consider semantic interpretations of the sense concept in connection with abstract objects. In this respect the following provisions explaining Mader's “name conception” are important (Mader, 1994):

1. The sense of a name of abstract object amounts to understanding the role of this object as an element of general system; In other words, the meanings of conceptions are hidden in their relations with other conceptions of a certain whole. For instance, the concept of “complex number” is defined by describing the system of complex numbers, implying feasibility of algebraic operations with given properties, properties of categoricity and inconsistency of complex numbers theory and others.
2. The sense of a name ensures the potential to use it correctly; For instance, in mathematics it occurs in theoretical computations of deductive nature (Mader's opinion). From our point of view, the precision of mathematic language ensures it. For instance, one uses expression “the smallest subgroup containing set” to define H subgroup generated by set M in

natural language. From mathematical point of view, it means not “the smallest number of elements in subgroup,” but rather “any subgroup containing set M, contains set H as well,” what is unambiguously written using mathematical symbols, for instance, in this way: $(\forall T \prec G) (M \subseteq T \Rightarrow H \prec T)$.

3. The sense of a name of abstract object contains the potential of presentation permitting to connect this name with the visual image.

However, one cannot visualize the sense of all conceptions studied at higher education institutions. With regard to learning process it is more accurate to say that the sense of objects’ names contains the potential to connect them with already assimilated knowledge (sometimes the latter is referred to as background knowledge), fixed with students’ personal experience. We call it intuitive arsenal.

Thus, interrelation between denotation and conception of a notion in “Fregean triangle” is bilateral (Figure 1): The conception characterizes the denotation (using properties of an object, its relations, intuitive representations etc.); denotate, in its turn, is embodiment of sense, objectified sense. From psychological point of view, the bilateral nature of this procedure is an important peculiarity of making sense (Zinchenko, 2002). Movement only in one direction deprives understanding of such property as wholeness. Philosophical hermeneutics pays attention to it: The process of making sense, in its essence, is movement, from whole to parts and from parts to whole (Gadamer, 1998).

The following conclusions, useful for instruction techniques, arise from semantic interpretations of sense:

1. Conceptual meaning of objects’ names (sense, conception) is more important for using notions than their object’s meanings (denotation). Let’s refer to this conclusion as to the principle of conception’s (sense) domination
2. The sense of concepts is in interrelations of this concept within the system of objective as well as subjective knowledge (intuitive arsenal)
3. The process of thinking as a component of making sense has double directional character.

That is why, from semantical perspective, the process of making sense while working with a text, implies distinguishing relations between sense and denotation of concepts.

2.3. Interpretation of the Concept of a Sense in Educational Cognition

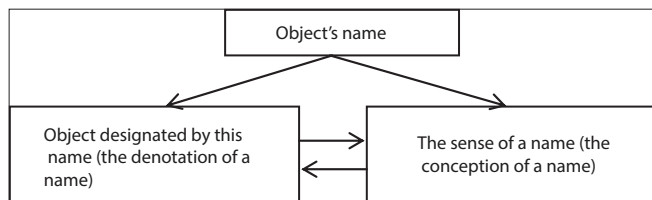
One can distinguish content and scope in any conception as the form of thinking. Many substantial attributes of given conception are included in its content, many objects to which this conception

is applied - constitute its scope. The term being linguistic expression of conception semantically characterizes the “name of an object.” Then, the scope of a concept reflects the denotation of a name (term), the content of conception does the same with the concept of a name (term). Therefore, one can say, the denotation of a concept “reflects its scope,” the meaning of concept - its content. It is important to use exactly the verb “to reflect” (not “to be”) here. For instance, the scope of the concept “permutation symbol” involves two numbers: 1 and -1. The denotation of a name (term) means an object which is designated. Not set {1, -1} is designated by the name “permutation symbol,” but rather the relation (functional in this case) between permutations and this set. The content of concept “permutation symbol” involves its substantial properties fixed by definition and theorems. They include the method of calculating permutation symbol (using formulae, graphs, permutation decrement, etc.), multiplicative property, and so on. The concept of “permutation symbol” as an element of system, involves not only properties, but also relations between these properties. Therefore, it answers the questions: “Why it is this way,” “how it can be done another way,” “what underlies the property,” etc. In other words, the scope of a conception and its content fix (materialize) conception’s relation between objects to which it is applied, between its distinctive attributes. Denotation and concept reflect the process of this fixation and its outcome.

Thus, semantic aspect in organization of learning process for student of higher education institution requires preparing such text, which could direct students at establishing relations between scopes of conceptions and their content. As conceptions are introduced by means of giving their definitions, the type of relations will be determined by the kind of definition. To study conceptions determined by genus-species definition one can make such relation specific in the following way:

1. Relation conditioned by genus concept. For instance, “permutation symbol - is a number calculated by the rule...” Genus concept is the concept of number from set {1, -1}. Having established this, we derive questions connected with this set. For instance, is there relation (dependence) between addition of numbers in given set and operations over permutations? Is there relation between multiplication and operations over permutations?
2. Relation conditioned by generic difference of definition. Not only logical aspect of generic difference, but its nature as well, are meant here. In other words, relation of dependence between the nature of studied conception and the nature of generic difference matter
3. Relation conditioned by the term. These can be different relations concerning the essence of the term as the linguistic expression of a conception. It is possible to regard conditionality in terms of etymological side of several terms. For instance, one can regard two algebraic conceptions “minor of element” and “minor of order k”. Both terms contain the common word “minor.” Does partial similarity of terms mean common semantic content? Asking similar questions and finding out answers to them reveal relations conditioned by the term. Finding out relations conditioned by the term is accompanied by the emergence of questions about why this

Figure 1: The semantic components of names (Frege)



very term is used, what part of concept sense is reflected by etymology of the term, etc.

Determining relation, it is important to use different constructions, which are symbolic and visualize images; their role in educational process is recognized (see review of this problem in: Dvoretckaia et al. 2015).

Considering above-mentioned facts, one can conclude that the core of methodical training of faculty member is to form the ability to organize student activity on determining sense in studied conceptions. This sense can be revealed, when the relations are established within learning material. We mean exactly those connections, which describe relations between the concept and denotation of studied concepts (substantial connections). The use of any pedagogical technology must be based on semantic analysis of educational text.

The semantic analysis of educational text is directed at implementation of two professional actions:

- Revealing methodical idea underlying prepared educational text;
- Preparation of educational text whose meaning structure encourages its productive perception.

Elements of perception efficiency involve pedagogical situations provoking questions directed at understanding of a text (Znakov, 1991; Dobraev, 1982). At the same time, understanding is interpreted as “consequential change of situation structure reconstructed by conscience and shift of situation mental focus from one its element to another. In these conditions the significance of relation between elements of the situation is being changed. The main stage of understanding process implies not only and not so much establishing relations, but rather, in the first place, determining their significance” (Brudny 1998,138).

For instance, one should take into consideration the following directions of structuring educational material in order to organize “understanding instruction” in mathematics:

1. In mathematics significant relations, whose establishment contributes to shaping integral knowledge, are abstract connections, that is why, material aimed at being understood must be focused on creating such situation which would have a center capable of abstract movement;
2. Focus shift is conditioned by filling with meaning (according to concept domination principle) in two directions: To distinguish between general and specific;
3. Teaching process should look like situations with “shifting focus” - components of mathematic structure.

While teaching matrices one can mark out several situations:

- The situation of defining a concept (table, rows and columns - from them to image);
- The situation of giving an example (denotation, attaching significance);
- The situation of initial understanding of a concept (what it represents, why it is regarded, where one can face it, etc.);
- The situation of exploring essence (reflection of plurality thought as something unified);

- The situation of object analysis (rows and columns are regarded as arithmetical vectors, etc.);
- The situation of operationalizing concept (algebraic operations etc.).

The situation of objective essence of matrix concept in its initial form can exist on intuitive level. Let us put it that way: An array of elements is contrasted to a certain table - matrix. Later the situation is changed as the array of elements is specially ordered (which leads to Cartesian product). Similarly, in the situation of initial understanding, the structure of which is changed from “ordinary” beliefs about tables at the beginning to linear operator defined by matrix in the end.

Initial understanding of matrix is connected with its visual image, further with generalization (as an element of a certain set), then focus shifts to the component of algebraic structure (for instance, ring), and so on. Simultaneously, the significance of relations is changed. If at the beginning, the relations were visual, afterwards they gradually transform from being ordinary towards being more abstract beliefs.

Gradual assessment of the relations of matrix conception (relationship of belonging to algebraic structures, the use in different theories and so on) leads to understanding the concept of set of matrices as the model of algebraic structures.

2.4. Semantic Aspect in Methodical Training of Faculty Members in its Recursive Model

Recursive model of methodical training of faculty members at higher education institutions implies circulation in forming pedagogical competencies. This circulation in its development leads to role shifting within the array: Curriculum developer may focus on pedagogical technologies, expert assessment, management, teacher training (Melekhina, 2015). Semantic aspect in methodical training of faculty members is connected with subject domain, to considerable degree, that is why, it is included in every role in specific form. Considering that faculty member acquires certain components of her competency in every role of recursive model of methodical training, semantic aspect has different expression in each role. Curriculum developer focused on pedagogical technologies selects the most efficient pedagogical technology enabling students to achieve maximum understanding of material. Naturally, special features of knowledge domain determine the choice of technology. Associating these special features with pedagogical technology, faculty member uses the first manifestation of semantic aspect of her methodical competency. It is connected with semantic analysis of educational text prepared for students. Faculty member composes the educational text using different sources (textbooks, manuals, e-resources, etc). The selection is based on faculty member’s assessment of the degree of understandability of ready text. The mechanism of figuring out concept and denotation of studied conceptions works here. Every ready educational text needs adaptation to be used in teaching (according to didactic principle of taking into consideration students’ individual properties). Faculty member prepares her own teaching material. The second mechanism of semantic aspect in methodical training

starts working during these preparations: Establishing significant relations. Faculty member selects optimal pedagogic technology based on distinguishing features of these relations. Curriculum developer focused on research associates organization of students' learning activity with learning outcomes i.e. with students' degree of material understanding: Reproduction, recognition, reformulation, constructing (Sotnikova, et al. 2008). In the course of search for associations the faculty member analyses students' responses i.e., makes semantic analysis of given texts. The work of curriculum developer focused on expert evaluation contains, in particular, examination of methodological recommendations. She analyses the fullness of semantic load of methodical projects, demonstrating skills in carrying out semantic analysis. Curriculum developer focused on management, exercises control over association of her own pedagogical practice with strategic educational guidelines (higher education institution's organisational culture, educational standards, etc.), works with the framework of organization of learning process (Shornikova, 2011). Semantic aspect combines two parallels of educational space in its activity: The parallel of learning activity concerning certain subjects and organizational line of learning process. Curriculum developer as "playing coach" makes scientific research in her field, which is directly associated with establishing semantic relations and, therefore, involves mechanisms of semantic analysis.

So, semantic aspect of methodical training of faculty members is manifested in all her roles within the recursive model.

3. RESULTS

Recognizing recursive model of methodic training of faculty members as being efficient in modern system of Russian higher education, one must recognize that its basic aspect is associated with faculty member's competency to carry out semantic text analysis. Semantic analysis of educational text in general terms includes figuring out sense (conception) and referent (denotation) of studied concepts, establishing relations between them. Actions associated with carrying out semantic analysis are defined by special features of the subject. For instance, these actions concerning mathematics may involve the following operations:

- Grasping the structure of content components (mathematical sentences): Definitions, theorems, algorithms and so on;
- Figuring out the type of mathematical sentence (for instance, implicative theorem, axiomatic definition and others);
- Establishing logical relations between properties of concepts (for instance, conjunction of generic differences in defining mathematical concept);
- Constructing interpretations of concepts and their interrelations (giving examples and contra-examples);
- Writing with the use of symbols (schemes, tables, mathematical symbols).

Taking this into account, the principle of correspondence between teaching techniques' and methods of studied science, the choice of pedagogical technology must be defined by involving students in activity associated with making the mentioned actions.

A characteristic feature of actions directed at establishing semantic relations is their bidirectionality. For instance, from concept content to the scope of concept and vice versa. That is why, the completeness of teaching tasks for assimilating material at necessary level of understanding is defined by the presence of actions from abstract to concrete and vice versa.

Teaching semantic analysis in recursive model of methodical training of faculty members amounts to helical motion across the cycles consisting of three following stages:

Stage 1 (methodological). Introduction to theory of semantic analysis. At this stage the issues of general approaches to teaching techniques are studied: Structure of components of material content, their kinds, significant relations in the text are characterized, etc.

Stage 2 (informational). At this stage certain facts of subject field are articulated and associated with semantic analysis. This stage has dual significance: On the one hand, the fundamentals of discipline are taught, on the other hand, the semantic aspect of studied educational text is illustrated.

Stage 3 (practical). It dedicated to the practice of constructing educational text through the system of specially selected learning tasks. Performing these tasks solves not only methodical problems but also encourages deepening and expanding subject knowledge which is important.

Every single cycle of methodical training consists of three mentioned stages on its level. Shaping methodic competency is performed indirectly.

Suggested recursive model of methodic training of faculty members can be applied in teaching of any discipline at any level of higher education. Semantic aspect of methodic training of current faculty members can be used within the framework of programmes of continuing education (for instance, "Faculty member at higher education institution" programme) or via the system of tutorial seminars held at the departments.

4. DISCUSSION

Issues concerning methodic training of Russian faculty members are intensively researched in respect of professional development programmes; the review of this research is given in monographs (Shornikova, 2011) and manuals on pedagogics of higher education institutions (Gromkova, 2012; Zagvyazinsky, 2001; Popkov and Korzhuev 2010; Reznik, 2015; Tatur, 2005; Fokin, 2005; Chernikova, 2011). As a rule, books on professional development programmes and the practice of their implementation concern only general issues of methodic training. The system of indirect methodic training in the system of Russian higher education works only in respect of education specialists. Future graduates planning to carry out their professional activity as faculty members, form methodical competencies while studying teaching techniques. However, methodical training is not properly spread in theory and practice of training other professionals. Following

the idea of innovative training (Shadrikov, 2004) actually realized in the system of Russian higher education, it is necessary to build the system of methodical training in higher education institutions. One has to take into consideration several circumstances while developing general conception of teaching techniques and its implementation at modern stage of higher education advance in Russia:

- Current faculty members were not included in the system of shaping methodical competency; individual positive facts are not of systemic nature;
- The practice of applying competency-oriented format in the system of higher education has not achieved proper development;
- Current trends in higher education are directed at work with text (oral, written, digital).

First and foremost, one should take into account that logical and psychological problems of constructing academic subjects direct towards hermeneutic components: The very semantic structure of educational text has considerable impact on the process of its understanding (Davydov, 2000; Doblaev, 1982).

Faculty members should pay particular attention to special questions of teaching techniques of certain subjects as teaching only general techniques does not always lead to faculty member's productive activity in arranging learning activity of students. Semantic aspect is of fundamental nature in these subject issues, because student educational activity in higher education institutions is based on work with the text.

5. CONCLUSION

Semantic aspect of methodical training of faculty members at higher educational institutions is the core of their exclusively professional activity, because it is the basis for all main roles of faculty members (ones of curriculum developers focused on pedagogical technologies, expert assessment, management, teacher training. Using recursive model of methodical training, suggested pedagogic technology of shaping skills in making semantic text analysis can be implemented in accordance with the cycles each containing methodologic, information and training stages. Faculty members are expected to teach students to carry out semantic text analysis at every stage of each cycle. The system of cycles must develop (expand and extend) competencies in the field of semantic text analysis. This aspect of methodical training is developed theoretically. Its technological part still requires further development. Further advancements must be unconditionally connected with taught subject, as special features of semantic content of educational text on each subject have their distinguishing properties.

Shaping skills in carrying out semantic analysis is practically used in the course of implementation of professional development programmes. We are not familiar with the practice of using semantic analysis within basic educational programmes (designed for any but pedagogical professions). The suggested technology seems productive for using in postgraduate education at current stage of development of Russian higher education. However,

further scientific pedagogical research is needed for its actual use; this research should take into consideration theories of andragogy, distinguishing properties of certain subject, which were not covered in this paper.

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REFERENCES

- Brudny, A.A. (1998), *Psihologicheskaya Germeneytika*. [Psychological Hermeneutics]. Moscow: Labirint.
- Chernikova, T.V. (2011), *Gumanitarnye Tekhnologii Prepodavaniya v Vyshey Shkole*. [Humanities' Technologies of Teaching at Higher Education Institutions]. Moscow: Planeta.
- Church, A. (1960), *Vvedenie v matematicheskuyu logiku*. [Church, A. Introduction to Mathematical Logic]. Moscow: Foreign Literature.
- Davydov, V.V. (2000), *Vidy Obobshcheniya v Obuchenii: Logiko-Psihologicheskie Problemy Postroeniya Uchebnyh Predmetov*. [Types of Generalization in Teaching: Logical-Psychological Problems of Constructing School Subjects]. Moscow: Russian Pedagogical Community.
- Doblaev, L.P. (1982), *Smyslovaya Struktura Uchebnogo Teksta i Problema Ego Ponimaniya*. [Semantic Structure of Educational Text and the Problem of its Understanding]. Moscow: Pedagogica.
- Dvoretckaya, E., Melekhina, V., Sotnikova, O. (2015), Symbolic approach to education in ethics. *Procedia - Social and Behavioral Sciences*, 174, 3228-3235.
- Fokin, Y.G., editor. (2005), *Tekhnologiya Obucheniya v Vyshey Shkole: Ot Teorii k Tekhnologicheskim Protseduram*. [Technology of Teaching at Higher Education Institutions: From Theory to Techniques]. Moscow: Bauman Moscow State Technical University Publishing House.
- Frege, G., editor. (1997), *Smysl i Znachenie. Izbrannye Raboty*. [Sense and Denotation. Selected Works]. Moscow: Dom Intellektual'noy Knigi. p25-50.
- Gadamer, H.G. (1998), *Istina i Metod: Osnovy Filosofskoy Germeneytiki*. [Truth and Method: The Basics of Philosophical Hermeneutics]. Moscow: Progress.
- Gromkova, M.T. (2012), *Pedagogika Vyshey Shkoly*, [Pedagogics of Higher Education Institutions]. Moscow: Yunity-Dana.
- Mader, V.V., editor. (1994), *Vvedenie v Metodologiyu Matematiki*. [Introduction to Mathematical Methodology]. Moscow: Interpraks.
- Melekhina, M. (2015), Recursive model of a methodical formation of a high school teacher in the context of competency-based education. *International Education Studies*, 8(2), 143-150.
- Popkov, V.A., Korzhuev, A.V., editors. (2010), *Teoriya i Praktika Vyshego Professional'nogo Obrazovaniya*. [Theory and Practice of Higher Professional Education]. Moscow: Akademichesky Proekt.
- Reznik, S.D., editor. (2015), *Prepodavatel' Vuza: Tekhnologii i Organizatsiya Deyatel'nosti*. [Faculty Member at Higher Education Institution: Technologies and Organization of Activity]. Moscow: Infra-M.
- Shadrikov, V.D. (2004), *Novaya model' spetsialista: Innovatsionnaya podgotovka i kompetentnostnyy podhod*. [New model of professional: Innovation-based training and competency-oriented

- approach]. *Vysshee Obrazovanie Segodnya*, 8, 26-31.
- Shornikova, N.Y., editor. (2011), *Povyshenie Kvalifikatsii Prepodavateley Vysshey Shkoly*. [Advanced Training of University Faculty Members]. Moscow: Yunity-Dana.
- Sotnikova, O.A., Fefilova, E.F., Goza, N.I., editors. (2008), *Germenevticheskiy Podhod k Obucheniyu Matematike (Teoreticheskiy Aspekt): Monografiya*. [Hermeneutic Approach to Teaching Mathematics (Theoretical Aspect): Monography]. Syktyvkar: Komi Republican Academy of State Service and Administration.
- Tatur, Y.G., editor. (2005), *Obrazovatel'ny Protsess v Vuze. Metodologiya i Opyt Proektirovaniya*. [Educational Process in Higher Education Institution. Methodology and Planning Experience]. Moscow: Bauman Moscow State Technical University Publishing House.
- Valitskaya, A.P. (1998), *Obrazovanie v Rossii: Strategiya Vyбора*. [Education in Russia: Choice of Strategy]. Saint-Petersburg: Herzen State Pedagogical University Publishing House.
- Zagvyazinsky, V.I. (2001), *Teoriya Obucheniya: Sovremennaya Interpretatsiya*. [Theory of Teaching: Modern Interpretation]. Moscow: Akademiya. p192.
- Zapesotsky, A.S., editor. (2002), *Obrazovanie: Filosofiya, Kul'turologiya, Politika*. [Education: Philosophy, Culturology, Politics]. Moscow: Nauka.
- Zinchenko, V.P., editor. (2002), *Psihologicheskie Osnovy Pedagogiki*. [Psychological Grounds of Pedagogics]. Moscow: Gardariki.
- Znakov, V.V., editor. (1991), *Ponimanie kak problema psihologii myshleniya. Voprosy Psihologii*, [Understanding as a problem of psychology of thinking. Problems of Psychology], 1, 18-26.