

Cognitive Space of Professional Training of Students

Natal'ya D. Koletvinova^a and Seimbika U. Bichurina^a

^aKazan (Volga region) Federal University, Kazan, RUSSIAN

ABSTRACT

Relevance of this problem is caused by the fact that the question of definition of cognitive space and its role in professional training of students is insufficiently developed. In this regard this article is directed to reveal the cognitive components promoting updating of subject matter of education and bringing out its priority parties. The leading technologies of research of this problem are technologies of cognitive activity, research technologies, technologies of creative development, technology of mastering of speech activity types with adequate speech making, self-activization, personification, etc. Results of the done work during which students have mastered the main functions of cognitive activity, the professional and communicative importance of cognitive components in aspect of expediency and relevance of their use are reflected in the article. Materials of article can be used in practical professional activity of higher educational institution teachers and comprehensive school teachers.

KEYWORDS

Cognition, associative support, a cognitive integrity, conceptual definiteness, functionality, speech activity, cognitive components, perception, memory, understanding, a categorization

ARTICLE HISTORY

Received 16 March 2016
Revised 10 June 2016
Accepted 22 June 2016

Introduction

Urgency of the problem

Modernization of modern higher education demand need for its considerable updating. Social need for improvement of the teacher's pedagogical skill is directed to essential change of the parties of important substantial and procedural resources, optimization of the technologies, methods, forms and tutorials providing increase of the teacher's professional skill. The modern educational space in general causes backbone development of all its components, including information space, cognitive, multicultural, axiological, etc. Tendencies and rates of development of modern

CORRESPONDENCE Natal'ya D. Koletvinova ✉ bichurina@yandex.ru

© 2016 Koletvinova and Bichurina. Open Access terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>) apply. The license permits unrestricted use, distribution, and reproduction in any medium, on the condition that users give exact credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if they made any changes.

society demand deepening of a fundamentalization process of the expert's professional training, meeting requirements of modern society, understanding of priority of the personality's intellectual level growth.

The modern scientific community actively considers now various approaches to a problem of improvement of the teacher's professional training quality (Kolesnikov & Lebedeva, 2012; Elina et al, 2015). However, there is no unambiguous solution of this problem. An innovative orientation of training with development of student's research and the self-activation abilities can be considered here as the uniting origin. This demands a new view on a problem of informative abilities development, finding of the new parties in professional technologies, forms and methods of training of the modern teacher. Therefore consideration of cognitive space topic is directed to identification of the necessary and sufficient cognitive training components allowing to build together a holistic picture of the key moments of development of the intellectual personality capable independently to build innovative bases of pupils training on the basis of research achievements.

It is expedient to carry out mastering of cognitive and communicative competences by students on the basis of specially developed backbone complex of cognitive units of the multifunctional professional importance.

Inclusion of students into the practice-oriented process of professional training of cognitive components allows to aim students from the very beginning at understanding of the importance of cognitive reasonable substantial and procedural resources in professional activity of the teacher.

Literature Review

Now the problem of training of the modern teacher, meeting basic public needs, is in the center of a versatile profile scientists' attention (Minayev et al., 2008; Krasinskaya, 2015). The requirement for updating of subject matter of education has caused a number of questions among which priority place is taken by a question what is a fundamental link in transfer of vocational communicative training of students to qualitatively new level (Starodubtsev et al., 2015). Scientific views on a topic of professional training quality improvement are notable for a wide variety of a training material in aspect of cognitive educational space. Now intensive development of the cognitive science directed to research features of perception in all areas of its existence is noted (Zimnaya, 2001). In this regard increase of interest in a problem of professional communicative competence development in the context of the expert's cognitive activity is natural. This problem has multilateral nature and relies on use of fundamental educational technologies in terms of finding of their new parties promoting increase of cognitive activity and training quality of students. The big place is given to innovative interpretations of pedagogical technologies, methods, techniques, principles and approaches: cognitive technology, research technology, design technology, realization of integration connections methods, activization of the personality, reproductive-creative method, etc. Definition of priority components of the teacher's cognitive activity, the choice of the corresponding forms and methods of the presentation of a training material is carried out on the basis of all technologies and methods. It will allow the future teacher to carry out the creation of educational process on the basis of self-organization, self-education and self-development (Andreyev, 2013), to form student's qualities of intellectual self-knowledge and self-research. If to take into account that professional communicative competence in the context of cognitive

activity is not auxiliary function, but fundamental in the training communication, then it becomes clear that any incomplete work in the course of training of students in terms of professional competence development causes poor quality of knowledge of pupils. Productivity of future teachers' professional training is based not on mastering of the separate professional-oriented kinds of activity with cognition elements, but on backbone integrity of the interconnected and interacting components of cognitive space of the professional focused educational process.

The analysis of priority components opens opportunities for development of pedagogical material with inclusion of the necessary and sufficient valuable focus directed to "formation of student's aim for learning during all life".

Results

Definition problems of the leading cognitive space components of development of students' professional communicative competence

Expediency of priority cognitive components inclusion in process of students' professional training is caused by a number of problems. Solution of this problems helps to find a new strategic line of communicative competence development in the context of professional activity of the specialist that demands from students' good knowledge and understanding of expediency of cognitive aspect use in work.

Deduction of cognitive space is defined by the following conditions: finding of the cognitive parties which are responsible for receiving the professional focused knowledge, definition of creative use of the cognitive components technologies aimed at the development of intellectual potential of students, a personal factor in judgment of surrounding reality, and also detailed consideration of a certain intellectually actioning verbal forms of influence on development of memory, attention of students taking into account ability of the person to perceive the experience and all data "at the entrance" in categorical sense bearing way (Thomas, 2012). Need for introduction of cognitive components to vocational training of students is connected with inability to build professional intellectual communication taking into account development of cognitive activity of pupils and their creative independence; misunderstanding by students of essence of the cognitive components directed to a purpose of concrete content of activity, to development of integrity, systemacity and durability of knowledge. Here not selection of cognitive elements of a lesson, but profound knowledge of all components of cognitive activity and their role in multifunctional professional activity of the teacher is necessary.

The backbone complex of cognitive blocks with the corresponding components has been developed for this purpose. This set of cognitive blocks with components of a multifunctional professional orientation makes cognitive educational space of professional training of students.

According to this the solution of the problem of development of future teacher's professional communicative competence demands new approaches, new resources in mastering by students' professional communicative competence.

Mastering cognitive- competency components is an important condition for increase of productive competency preparation. Special cognitive and communicative tasks and materials with prevalence of intellectual and research types of work have been developed for the solution of objectives. Work has poly-phased

Structural and substantial bases of cognitive educational space in aspect of professional activity of the teacher

At the first stage of the practice-oriented training of students bases of cognitive educational space with definition of their components and the importance for professional communicative activity were analyzed. At the beginning of work diagnostics of determination of psychological readiness level of students for perception of the professional focused information material with various manifestation of a cognition was carried out. Level of cognitive abilities in the context of development of professional communicative competence, the level of understanding, receiving and using of knowledge, level of understanding of the importance of cognitive aspect for professional speech activity was defined. Diagnostics showed the insufficient level of psychological readiness of students for perception of a cognitive factor of professional communicative activity.

At this stage, students are offered backbone blocks with cognitive components: block of professional cognitive validity, block of associative support, block of a cognitive integrity, block of cognitive modeling, block of conceptual definiteness, metablock, etc. Students had to choose those components which would cause in them the greatest interest. The choice had to be reasonable, inclusion in cognitive space of these blocks is caused by their close interaction with various types of professional speech activity in a context "speech thought". On this basis strictly certain cognitive space providing the detailed mastering by students cognitive and communicative competence was thought over and deduced.

From the presented cognitive blocks students have chosen the block of professional and cognitive validity with the following cognitive components: producing of speech, semantic networks, reference, and relevance. The provision about low, in their opinion, rate of their use and ignorance by students of cognitive potential of these components has been put forward as justification. The cognitive space of a professional orientation is based on interaction of speech and cognitive activity that demands from students' adequacy of speech making of all types of professional activity.

According to this the special professional focused tasks have been developed in the context of the specialist's cognitive activity in which the priority role belongs to types of intellectual communication with adequate speech making.

Tasks include the professional-directed thematic situational-caused texts. Each text comprises the cognitive-caused elements aimed to develop cognitive independence of students. Work with texts demands development of the necessary and sufficient competences directed to interpretation of the scientific text into the educational text, pedagogically adapted text, the heuristic text, etc. The form of the interconnected training with types of cognitive speech activity acts as the main form of education here. At this stage the priority place is given to cognitive technology, communicative technology, technology of aspect and complex training, research technology, technology of motivational justification, focus on the addressee. The intellectual and communicative method and a search method have been assumed as a basis.

At the first stage of mastering bases of cognitive space students pay attention to structural and substantial components of professional activity of a cognitive orientation. They define components of cognitive activity from a position of their

importance/insignificance for development of professional communicative competence.

Students work on substantial and procedural character of a training material with inclusion in it cognitive components with various substantial, target and motivational goals. Cognitive blocks are considered in the context of their backbone character. Students define that systemacity of each block is reached by correlativity of its components. Correlativity, in turn, is provided by strictly certain interaction and interference of cognitive components in the course of multifunctional speech activity of the teacher.

Such activity causes satisfaction of students as it is directed to acquisition of professional experience and works for prospect (McKenzie, 2001). It demands the active help of the teacher who at each stage realizes feedback with the subsequent discussion (Race, 1993). At the first stage students' knowledge about types of professional activity of the teacher in the conditions of cognitive space is solidified.

Professional specifics of the cognitive block of professional communicative validity

The second stage of cognitive-competency training of students is devoted to the analysis of the cognitive block of professional communicative validity and to those its components which were chosen by students. This block includes main types of multifunctional activity of future teacher. The special place in this block is given to a speech producing, because creation of speech educational work, speech activity according to requirements of realization of cognitive potential of a training material allows students to seize necessary competences of intellectual dialogue communication, to find things in common in difficult relations of the speech and thought. Professional speech activity of the teacher is not a flow of thematically integrated words, but an art of the choice of the necessary and sufficient semantic phrases-indicators opening a way to those thought processes which can turn speech units into a complete cognitive form of manifestation for mind and heart. Such approach becomes a reference point for all types of professional speech communicative activity of the teacher.

Proceeding from the analysis of professional specifics of a producing, students independently deduce necessary substantial and procedural development bases of competence in the context of cognitive activity. At this stage the problem of speech activity in the context of its split-level cognitive modeling is regarded: consideration of the mental conditions of the speakers and listeners, consideration of their language and not language knowledge, cognitive prerequisites of speech behavior, different forms of its manifestation.

Students independently analyze such aspects of the speech producing as planning, an intentionality which dictate the choice of speech making of professional activity types with various strategy of their realization, because the same information can be given differently in different circumstances. Purposefulness, interactivity, intentionality, communicativeness, a sociality, compliance to constitutional factors and a cultural environment are noted as fundamental signs of the speech generation.

The purpose of the speech producing for motivation to action appears as an indispensable condition, because a basis of intellectual communication is activation of students and their familiarizing with creative understanding of the received information. The producing is considered as difficult and important cognitive

process in aspect of information receiving and processing. Students have paid special attention to such factor as linearization of the speech, its connection with methodical sequence of material studying. Performance and the analysis of such tasks promote development of students' aspiration to self-mastering the professional competences meeting requirements of modern society (Implementation of "Education and training 2010" work programme, 2010).

Such cognitive component as semantic networks cause sufficient interest of students. Students note that semantic networks promote increase of knowledge acquisition, storing of necessary information efficiency. Application of the "semantic networks" component in the course of professional activity develops competence of use not all the words united on sense, but only the most significant, bearing the main meaning; therefore, there is an accumulation of information around fundamental concepts which serve as conductors to other concept interconnected with them. This in many respects provides integrity and systematization of knowledge. On the basis of knowledge of semantic networks students try to distribute a studying material on the corresponding concepts. As associations in long-term memory of the person are connected with every semantic network, based on certain concepts, students note that an associative interrelation between already available concepts and receiving concepts takes place. This work allows to deduce the certain supports for the presentation of knowledge giving the chance to define methodical techniques and the principles of a consecutive and available statement of material through a prism of cognitive activity. Mastering this cognitive component is carried out by system of special communicative tasks and exercises. The cognitive technologies, a research method of activation, an immersion method, a method of projects belong to priority technologies.

The reference is among important cognitive components. This cognitive component is considered by students as a basis for a reasoning, the gradual compelling coming to the correct answer to the problem put in the course of intellectual communication according to the difficult relation "speaking - the word-world". Communication will be successful if it is carried out on the basis of objective judgment of the world phenomena, that develops cogitative activity of students and their outlook, and also promotes the atmosphere of friendly interaction on the basis of joint search of truth. The reference is considered in close connection with purposes of the speech and the relation "truth - not truth".

Students note that the reference is directed to establishment of the relations between words and surrounding reality, professional actions and processes. The reference in development of the professional focused communication plays strictly definite role of relation and correlation of professional activity types and their speech making. Students carry out analytical work, finding methods of the expressions use possessing a reference in concrete types of speech activity. The attention is paid to the fact, that development of communicative competence convincing-intentional situationally caused character is connected with a reference.

In the course of work students perform assignments on design of activity with goal to search a convincing form of intellectual communication, create fragments of lessons with use of a reference as the leading factor. The cognitive technology, research technology, technology of design, a search method, an analytical imitation method, reproductive and creative method are among priority technologies of use.

Development of professional cognitive and communicative competence will be incomplete without analysis of the cognitive "relevance" component. It is explained

by insufficient level of proficiency in bases of work with the text and the discourse that is very important for speech activity of the teacher. This cognitive component is used in the course of the presentation of a training material in aspect of a cognitive orientation, because it is based on the choice of the necessary scientific statement meeting the requirements of the scientific and educational text. Ability to consciously find the most essential information taking into account target, motivational and substantial goals and bring it to the fore meets the requirements of cognitive selection procedure of the most significant in this context and for these communicative situations information. During work on this cognitive component, students develop competence of definition of the pragmatically highest point in information material of this or that discipline, management of intellectual communication process, work with presentation material taking into account the readiness level of address audience, to orient in a contextualization of statements with the terminological situational caused saturation. In the course of work the attention is also paid to social aspect of relevance as it includes the requirement to know features of address audience, the atmosphere in which an intellectual communication takes place.

Relevance is directly connected with target and motivational goal of cognitive professional activity. Acquaintance and understanding of features of cognitive components is aimed at the development of such competences as cognitive and information, cognitive and regulatory, cognitive stimulating, cognitive self-activizational, etc.

In the course of work students performed tasks of the problem and situationally caused character, directed to mastering necessary and sufficient forms of the work with the text. Here research, cognitive technologies of the differentiated training, communicative technology, an immersion method, a search method, a conscious and comparative method of project can be referred to number of priority technologies of use.

At the end of the second stage students perform tasks of the generalized character, considering together cognitive components analyzed here. Work has comparative character. Students independently design fragments of lessons with use of semantic networks, reference and relevance on the basis of the training intellectual communication. They define a role of the cognitive significant parties of professional communicative activity, perform specially developed tasks with use of cognitive components, concepts of logical character, improve competences of transfer from scientific contents to educational contents with wide use of cognitive components. Work is based on development in students' vision of necessary and sufficient components of cognitive educational space of a professional orientation, vision of professional opportunities of cognitive components. Students model and project the professional focused situations with various cognitive components. The attention of students is fixed on relevance and expediency of inclusion of cognitive components in a speech outline of various types of professional cognitive and communicative activity and their availability. The principle of stimulation and support of internal motivation in this process of training takes the leading place (Conner, 2006).

Performance of such tasks develops students' aspiration to self-knowledge, self-determination and self-mastering professional cognitive components. All tasks correspond the purpose for development of interest in knowledge, self-knowledge, self-research leading to realization of creative aspiration to be a self-discoverer that

meets the requirements of modern society (Implementation of “Education and training 2010” work programme, 2010). Priority place is given to cognitive technology, communicative technology, research technology, the principle of active communication, the principle of the conceptual presentation, the principle of systematicity, sequence, availability, individualization, differentiation of language means, interpretation of the text, a method of a contextual guess, a reflexive method, a integration communications realization method. After making special tasks examination is carried out on the basis of use of the corresponding quality indicators and deducing of productivity of mastering the specified cognitive components. Quality of work is estimated in the course of collective analytical discussion.

Associative supports in development of professional cognitive and communicative competence

At the third stage students investigated the block of associative support. In cognitive educational space this block is considered as set of the specific professional speech actions answering the purposes of a cognitive and communicative orientation.

Students consider the cognitive “activation” component in system of cognitive components as an important factor of development of personal qualities, the personified qualities. At this stage use of an activation component in the training intellectual communication is analyzed in detail, activation factors are deduced: availability, clarity, interest, understanding, practical need, further prospect of knowledge acquisition, etc. Students analyze external incentives of activation, accent features of verbal and nonverbal means, note their role in professional activity of the teacher, analyze three levels of incentives processing: representational, referential, associative. Students consider in what kinds of activity and under what conditions these levels are used, they define their productivity in professional activity, analyze them as the factors promoting training quality improvement. In the course of practical activities students consider what sections of the presentation of a training material, what means of professional communication are capable to make active these or those types of knowledge, what structures of consciousness they involve. During work students carry out various kinds of activity, performed tasks for modeling and design of lessons with goal for activation of pupils’ activity in the course of intellectual dialogue communication. Students perform tasks of the problem and situational caused character with the subsequent collective discussion. The priority place in the specified types of works is allocated to the principle of stimulation and support of internal motivation (Conner, 2006). On the basis of the done work support activators with the adequate speech making which activates cognitive independence of pupils have been allocated (use of elements of entertaining character, an address orientation of a question, training differentiation, rhetorical receptions, etc.). The cognitive technology, communicative technology, research technology; activation method, problem searching, conscious-active, emotional - semantic, etc. were among priority technologies of research.

A specific place among cognitive components is held by association. The association is a component of many professional activity types and acts as an important factor of improvement of figurative thinking. In the course of research activity students independently deduce personal, variable character of associations. During performance of special tasks, preparation of fragments of a lesson, students

consider association as an important factor of cogitative activity. In the course of practical activities students design the lessons aimed at the development of long-term memory on the basis of the associative opportunities realization allowing to take from memory and to apply the knowledge gained earlier. Students note that the association as a cognitive component is realized in all types of a training material. In the context of associative support and design of dialogue communication with goal on development of informative independence of students the intellectual communication is carried out on the basis of which informative abilities as important personal quality develop. Cognitive capacity of associations allows to use the various situationally caused types of activity on the basis of application of analogy, associates that increases quality of training, develops cognitive abilities. Performance of the practice-oriented tasks, modeling of activity has allowed students to understand conditions for using associations in many types of professional cognitive activity, to develop associative and communicative competence.

In completion of work on this cognitive component the game "Travel in the World of Associations" is held. All game participants prepare multidirectional fragments of a professional picture, to describe essence of which is possible only leaning on associative supports. During game students use the cognitive potential of concept "association", switch on long-term memory, support, rely on richness of the speech, synonymic variants. Game comes to an end with collective discussion of performances and counting of points by the following indicators: appeal to long-term memory, use of associates, analogies, richness of a lexicon, split-level sinonimization, etc.

In the course of work on association students performed assignments for design of the situations demanding wide use of associative potential, analyzed a training material, held test, answered questions for reflection. Performance of such tasks promoted development of cognitive competence in the context of management of associative opportunities of the audience, increasing the informative level of intellectual communication. The cognitive technology, technology of the differentiated training, reflexive technology, communicative technology, an analytical imitation method, a comparative method, a conscious and active method, an emotional and semantic method, an immersion method are among priority technologies of research.

Development of such cognitive component as attention in professional activity of the teacher takes a specific place (Thomas, 2012). Proceeding from it, students have independently collected and systematized material on the cognitive concept "attention". Students have deduced main types of professional activity, have deduced the factors providing attention, have specified formula of interaction and interrelation between all components. On the basis of the done work students determined conditions for receiving feedback, dependence of concentration of attention on various factors: motivation, interest, features of speech making of material statement, condition for creative self-development and self-knowledge, etc. In the course of the practice-oriented activity students analyzed an attention role in development of personal qualities of pupils, in intellectual education on the basis of which any control of attention, ability to concentrate, observation is carried out. Connection of attention with logical development of pupils was considered in detail. Students analyzed how on the basis of attention ability to draw conclusions, to make judgments, to find ways of the solution of tasks was developed. The attention is

considered as the prerequisite for activation of knowledge, self-education, self-development, self-knowledge, as the prerequisite for improvement of preparation for professional activity in aspect of strengthening of function of availability and an intellectual saturation. The attention, considered in aspect of development of cognitive and communicative competence, can take the form of active search and promotes more exact identification of objects, their reflection from other objects.

During performance of specially developed tasks students regarded ambiguity of function of attention which is differently realized in different types of professional activity. Various concentration level of attention requires from the teacher a solution of the problem of development of regulatory and orientation quality of pupils. Students actively perform on topical issues of pupils' attention development, development of professional competence of the intellectual communication organization (Sleeman, 1992).

In the course of the practice-oriented work students made different tasks regarding the main indicators of attention taking into account professional specifics. Students prepared the lesson fragments aimed at the development of pupils' attention, defined specific features of his development, analyzed means of his concentration. They performed problem tasks, focusing attention on productivity of the work. When performing each task students emphasize the cognitive orientation of attention providing development of informative, creative independence and mental abilities of students.

In completion of work of this stage students have the examination including questions for reflection and the analysis of own research activity in the context of requirements of modern education. Here research technology, reflexive technology, communicative cognitive technology, an activation method, a search method, conscious and active, emotional and semantic, comparative method can be referred to priority technologies.

Completion of work on this cognitive block included performance of generalizing examination, on the basis of consideration of set of cognitive components in aspect of their specifics and importance for professional activity. Work was constructed on the basis of mastering the defining cognitive components of the associative support block. Students noted that its components were realized in all types of professional activity. Their introduction to cognitive educational space is connected with the motivational-target and substantial-procedural parties of professional activity. Students made tasks for definition cognitive significant indicators of the studied components, conditions of optimum use of their intellectual potential, and also expediency and relevance of their application in certain types of professional cognitive and communicative activity. Besides, the big place was given to tasks for development of informative independence of the students, mental abilities, creative solution of objectives, design and modeling of lessons assignments with use of cognitive components of professional activity in the context of training quality improvement.

During this work, students analyze features of professional use of cognitive components. The situational caused exercises with further justification of methods of expediency and motivational validity of these components application and the used creative and research means in professional activity were considered. At this stage students' cognitive competence and competences of cognitive and creative interaction with address audience develops. Students showed that they understood the importance of the analysis of activation, association and attention features in

the cognitive terms that it is connected with increase of efficiency of intellectual training of pupils, with their further demand in society.

The priority part at this stage is assigned to cognitive technology, the competence-forming technologies, research technologies, a method of activation, a contextual guess, communicative intension, criteria methods, the principle of situational and thematic conditionality, a method of realization of integration communications, the principle of individualization.

Mastering cognitive components promotes development of such professional and communicative competences as cognitive competence, competence of the regulatory and cognitive organization, cognitive and information competence, meta-language competence, cognitive and associative competence, cognitive and activation competence. Possession of these competences provides experts with sufficient success in an educational field of activity and meets the modern requirements.

Discussions

Researches on the topic of estimation of productivity and quality of the specialist's competence training in cognitive aspect reflect variety of scientific views and unexplored questions, each of which requires the optimal solution. This topic is actual, that is confirmed by the scientific works of many scientists reflecting variety of approaches and the points of view on its decision. The problem of theoretical knowledge and theoretical thinking in the context of information transfer reveals interestingly, the problem of research activity, development of creativity of students in a professional context is analyzed (Maslova & Abashina, 2009), the problem of memory, thinking, imagination in unity of human consciousness and evolution is developed in detail (Feldstein, 2009). In concepts of foreign scientists the cognitive aspect of professional training of the specialist is considered in the course of the solution of the practice-oriented tasks (Vebter & Safyannikov, 2010; Oxford, 2011); application of cognitive approach in ethical and reflexive factors of professional activity is analyzed (Rbodes, 2001); continuous improvement of diagnostic tutorials is considered in cognitive aspect (Castro et al., 2009).

However, there is no comprehensive solution of the problem of students' professional readiness development on the basis of wide use of a cognition. The number of questions remains unexplored. Bases of cognitive fullness of various types of professional communicative activity aren't defined. There is no unambiguous approach to formation of cognitive competence at higher education institution. Specifics of application of cognitive components in each separate case of professional pedagogical activity aren't investigated, technologies of inclusion of cognitive components in process of professional training of students, aren't discovered. This article is devoted to the aspect of the practice-oriented development of professional communicative competence on the basis of cognitive approach with forecasting and perspective vision of the carried-out activity results.

According to it the special backbone complex of cognitive blocks with adequate components of a professional orientation has been developed. The priority part in this research is assigned to the cognitive blocks including motivational caused substantial and procedural resources of carrying out professional activity. Research has shown efficiency of the choice of the technologies, methods and approaches promoting development of professional cognitive training of future teacher capable to achieve the high intellectual level of training. Most of students have high level of

mastering cognitive components of professional multifunctional communicative activity. Thus, results of the done work on development of professional cognitive and communicative competence in the process of the practice-oriented training have found reflection in the article.

Materials of article can be used in the course of practical professional activity of teachers of higher educational institutions and teachers of comprehensive schools.

Conclusion

The results received during systematic and purposeful work have shown that the formation level of bases of students' cognitive and communicative competence meets the modern requirements of education. Students have seized necessary and sufficient cognitive components of professional communicative speech activity, have acquired methods and techniques of their use in the context of a goal-setting and motivation of all types of professional communicative activity of an informative orientation. Students have learned to orientate in cognitive space of the applied professional components, defining expediency and relevance of their use in various types of multifunctional professional activity with forecasting of productivity and perspectiveness.

The choice of priority technologies, methods and forms of professional activity decided by their correlation to cognitive components in aspect of their coherence and interaction with various types of professional communicative and speech activity. Students defined cognitive components, important for the teacher's profession, defined their functions and value for formation of qualities of self-activation, self-development and self-knowledge. Students showed possession of cognitive activity taking into account requirements of intellectual dialogue communication and features of multifunctional activity of the teacher. Pedagogical working conditions were considered by students in the context of their professional, cognitive, axiological, ethical, esthetic potential, and also research and creative opportunities and the importance for professional activity of the teacher.

The conducted research allows to draw the following conclusions: system approach to development of professional cognitive competence training of students on the basis of increase of its quality and productivity is carried out. Cognitive blocks of development of cognitive competences in the context of their functional belonging are developed. Their substantial and procedural saturation and specifics of the professional focused application is defined. Pedagogical conditions of cognitive components use at the level of different types of professional communicative activity with adequate speech making are defined. Ensuring means of interrelation and interaction of all elements of the teacher's professional activity on the basis of cognitive and competence-based approach are revealed. Professional reference points and supports for the choice of the corresponding cognitive components depending on a motivational purpose of different types of activity are presented. Specially developed tasks promote development of the independent intellectual qualities of future teachers in the context of modern requirements of training and education. Use of the cognitive, reflexive, communicative and activity, person-centered, differentiated and creative approaches in professional training of students as significant in achievement of efficiency and productivity of application of the corresponding cognitive components in professional activity of the teacher is analyzed.

Acknowledgements

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Natal'ya D. Koletvinova, is PhD, Professor of Kazan Federal University, Kazan, Russia.

Seimbika U. Bichurina is PhD, Professor of Kazan Federal University, Kazan, Russia.

References

- Andreyev, V. I. (2013). Systematization of the pedagogical and didactic laws integrative focused on the guaranteed quality of education. *Education and self-development*, 3(37), 3-10.
- Castro, M. E., Niño, A. & Muñoz-Caro, C. (2009) GMAT. A software tool for the computation of the rovibrational g matrix. *Computer Physics Communications*, 180(7), 1183-1187.
- Conner, M. (2006). Andragogy and Pedagogy. Direct access: <http://agelesslearner.com/intros/andragogy.html>.
- Elina, E.G., Kovtun, E.N. & Rodionova, S.E. (2015). Competences and results of training: logic of representation in educational programs. *The higher education in Russia*, 1, 10-20.
- Feldstein, D. I. (2009). Psychology of the person's development as personality. Voronezh: MODEK. 454p.
- Implementation of "Education and training 2010" work programme. (2010, November 17). Key Competences for Lifelong Learning. A European Reference Framework. Direct access: <http://europa.eu.int/comm/education/policies/2010/doc/basicframe.pdf>.
- Kolesnikov, A. K. & Lebedeva, I. P. (2012). Modelling of satisfaction of consumers with educational services of the higher school. *The higher education in Russia*, 12, 37-45.
- Krasinskaya, L. F. (2015). Teacher of the higher school: what kind should he be? *The higher education in Russia*, 1, 37-46.
- Maslova, N. F. & Abashina, A. D. (2009). Professional training of students during design studies. *The higher education in Russia*, 1, 170-173.
- McKenzie, J. (2001). How Teachers Learn Technology Best. *The Educational Technology Journal*. Direct access: <http://fno.org/mar01/howlearn.html>.
- Minayev, I., Vostrukhin, A., Vakhtina, E. & Ushkur, D. (2008). Creation of laboratory base of the advancing training. *The higher education in Russia*, 9, 10-14.
- Oxford, R. L. (2011). *Teaching and Researching: Language Learning Strategies*. Harlow: Pearson Longman. 116p.
- Race, Ph. (1993). *Never mind the teaching – feel the learning*. Birmingham: SEDA. 80p.
- Rhodes, F. T. (2001). *The creation of the future*. Ithaca. 34p.
- Sleeman, D. (1992). *Intelligent Tutoring Systems*. New York: Academic Press. 345p.
- Starodubtsev, V. A., Solovyov, M. A. & Valitova E. U. (2015). Pedagogical support of professional self-determination of students in higher education institution. *The higher education in Russia*, 1, 47-56.
- Thomas, G. P. (2012). *Metacognition in Science Education*. Springer, Dordrecht. 425p.
- Vebter, E. V. & Safyanikov, I. A. (2010). *Project-Organized Learning Method in the System of Engineering Education of Russia by the Example of National Research Tomsk Polytechnic University*. Barcelona: Creating Meaningful Learning Environments. 178p.
- Zimnaya, I. A. (2001). *Pedagogical psychology*. Moscow: Logos. 384p.