LOOK ACADEMIC PUBLISHERS
OPEN ACCESS

INTERNATIONAL JOURNAL OF ENVIRONMENTAL & SCIENCE EDUCATION
2016, VOL. 11, NO. 10, 3651-3660

Development Mechanism of an Integrated Model for Training of a Specialist and Conceptual-Theoretical Activity of a Teacher

Akhmat Marasulov[a], Amangeldi Saipov[b], Kulimkhan Arymbayeva[b], Begaim Zhiyentayeva[c], Akhan Demeuov[b], Ulzhamal Konakbaeva[d] and Akbota Bekbolatova[e]

[a]University "Miras", Shymkent, KAZAKHSTAN; [b]M. O. Auezov South Kazakhstan State University, Shymkent, KAZAKHSTAN; [c]L. N. Gumilyov Eurasian National University, Astana, KAZAKHSTAN; [d]South Kazakhstan State Pedagogical Institute, Shymkent, KAZAKHSTAN; [e]H. A. Yassawe International Kazakh-Turkish University, Turkistan, KAZAKHSTAN

ABSTRACT

The aim of the study is to examine the methodological-theoretical construction bases for development mechanism of an integrated model for a specialist's training and teacher's conceptual-theoretical activity. Using the methods of generalization of teaching experience, pedagogical modeling and forecasting, the authors determine the urgent problems in specialist's preparing for current educational process. Furthermore, the research defines the requirements made to the development process of the future specialist's training model and the main determinants of functional maps of the pedagogical activity. The practical value is that the submissions may be used as a basis for future investigations on creating an optimal model of educational staff development.

KEYWORDS
Educational process, teacher's conceptual-theoretical activity, specialist's training, pedagogical modeling and prediction, professional development of pedagogical personnel

ARTICLE HISTORY
Received 24 May 2016
Revised 27 June 2016
Accepted 14 July 2016

Introduction

Development trend of the current society, its strongly marked informatization explains necessity of increasingly wide use of information technologies in the sphere of education. Training of a specialist is a complex many-sided process (Saipov & Trigwell, 2015; Passey & Samways, 2016; Klarin, 1995; Radchenko, 1990). One of the universal research methods of such processes is modeling (Poshayev, 2012).

Basic materials in development of the specialist's model are the state compulsory standard of education (SCSE) (State compulsory standard of education of the Republic of Kazakhstan. The higher education. Bachelor degree. Basic provisions, 2008); priority directions of fundamental researches; concepts of scientific, scientific-technical and innovative policy in the sphere of

CORRESPONDENCE Amangeldi Saipov ✉ 7281190@mail.ru

education; scientific-technical programs; efficiency of carrying out of research and development in HEIs, etc. (Marasulov, 2008).

It is pertinent to point out that development of the future specialist's training model forms the basis of practical modeling realization as an instrument of study of certain objects or phenomena (Bowen, 2016). This development provides selection of all components of the activity, determination of significance of these components for the educational and production process and establishment of their interrelations (Marasulov, 2010).

Consideration of the specialist's training and activity model as the open, nonlinear and dynamic system provides need in the search of its adequate presentation (Shalayev & Sazonova, 2004). Considering this fact, we propose a variant of the logical-conceptual training and activity model of "Radiotechnics, electronics and telecommunication" (RET) specialist.

Literature review

Modern scientific-pedagogical researches give much prominence to the current specialist's training effective process modeling problems (Entonado & Díaz, 2006; Saipov & Trigwell, 2015).

Terms "model" and "modeling" are considered by scholars as an imply creation of the training quality criteria, which should have the specialist, establishment of correlation between them and pedagogical conditions focused on their formation (Smirnova, 1977; Marasulov, 2014; Popescu & Stefan, 2014; Carpenter & H. Dickinson, 2016). At that, not all authors put in equal concepts to the term "specialist's model".

The most acceptable term for us is given in P. Postnikova's (2004) research. Where under the specialist's model we understand "analogue of its activity expressed in representative characteristics, marked in a research on functioning of conditions and occurrence of specialists' union of interest to us".

Scholars agree that conditions for the model development consists of the following:

– Elements of the model structure (objects of understanding in the training process; requirements to the future specialist's personal qualities; requirements to the specialist's activity skills, habits and ways) (Markova, 1996).

– Components of the activity elements (production-technological activity, service-exploitation activity, organization-management activity, installation and checkout activity, estimation-design activity, experimental-research activity) (Kalimullin & Masalimova, 2016).

– Operational-practical component of the specialist's future activity (revelation of typical professional tasks; development of training and production tasks complexly covering all the educational and production activity; determination of place of these tasks in the content of education; selection of optimal training forms and methods of the considered tasks).

– Formation components of a conceptually commuting model (production sphere; scientific sphere; training sphere).

– Basic requirement components to the specialist (requirements to the professionally significant parameters of the specialist; requirements to the specialist's education) (Marasulov, 2014).

S. Zholdasbekova et al. (2016) and A. Marasulov (2008) argue that the specialist's model is not only opportunity to determine and forecast requirements to the specialist. At the same time, studies show that it is also the most important element in the general training of specialists to their future educational and operational activity, methodological basis for planning of educational and scientific processes (Klarin, 1995).

Aim of the study

The aim of the study is to determine the methodological-theoretical construction bases for development mechanism of an integrated model for a specialist's training and conceptual-theoretical activity of a teacher.

Research questions

What are the main problems in specialist's preparing for current educational process? What is the optimum concept of an integrated model for training of a specialist and conceptual-theoretical activity of a teacher?

Method

Research methodology is largely based on the theoretical pedagogical methods, namely on the method of generalization of teaching experience and analysis of pedagogical literature. Moreover, we used the methods of pedagogical modeling and forecasting based on monitoring of the main problems in specialist's training and conceptual-theoretical teacher's activity.

Data, Analyses, and Results

According to the existing experience, the following should be referred to the requirements made to the development process of the future specialist's training model in his educational and production activity:

– completeness of the developed model, i.e. content of the future professional activity should correspond to the solution level of basic professional tasks;

– connection with theoretical training material that will informationally provide opportunity for solution of pedagogical problems;

– period of study of theoretical material defines place of specific solutions' review;

– generality of the tasks allowing represent the most essential sides of the professional activity and the most meaningful parameters;

– typing of the tasks and consideration of opportunity to apply skills from one activity sphere to another (from the educational to the production and vice versa);

– consideration of typical difficulties and mistakes of the specialist in the professional activity process allowing train the future specialist to overcoming of the difficulties and liquidation of possible problems;

– selection of reasonable training forms, methods and ways for solution of educational and production tasks providing activation of the future specialist's cognitive activity in the training process, etc.

Depending on orientation on the model's leading components we specify the following:

– production sphere of the professional activity – objects of the professional activity, subjects of the professional activity, types of the professional activity, functions of the professional activity, typical tasks of the professional activity, direction of the professional activity;

– scientific sphere of the professional activity – technical innovations, fundamental researches, discoveries, environmental aspects;

– training sphere of the professional activity – objects of understanding in the training process, fundamental general and engineering-pedagogical and professional preparation, development of the professional activity taking into account problems of the educational and production processes;

– content of the professional activity – production-technological activity, service-exploitation activity, organization-management activity, installation and checkout activity, estimation-design activity, experimental-research activity;

– requirements to the personal qualities – presentation on spiritual values and their meanings, presentations and consequences of their activity, presentations on organizational liquidation measures of accidents, catastrophes, natural disasters and emergency situations;

– requirements made to the specialist's education – general education, socio-personal competence, economic-organization competence, skills, habits to the activity ways, special competences, preparedness to change social, economic, professional roles, education by basic cycles of educational disciplines, education by separate disciplines;

– requirements forming professional-significant parameters of the specialist – professional competence, communication preparedness, developed ability to creative approaches, stable, conscious, positive relation to the profession, possession by methods of technical-economic analysis, understanding of development trend of science and technics.

Taking into account all mentioned above, it is possible to compose the following structural-functional scheme for formation of the teacher's conceptual-theoretical activity mechanism (see Figure 1).

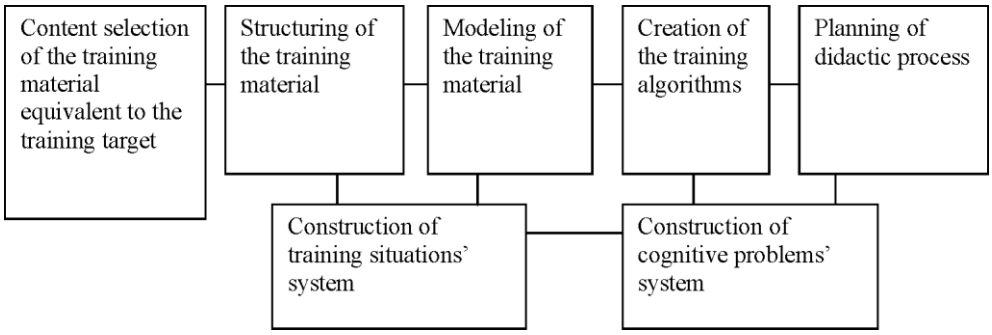


Figure 1. Structural-functional scheme for formation of the teacher's conceptual-theoretical activity mechanism

Can note that the functional map to a profession (specialty) is determined by the main key purpose and list of basic functions. In this connection, and as presented for us, in formation of the training content for preparing of the specialist, the following normative sequence should be observed:

(1) – determination of the main key purpose of the profession (specialty) by the state compulsory standard of education (SCSE) [11];

(2) – determination of the list of basic functions by the state compulsory standard of education (SCSE) based on (1) [11];

(3) – determination of the modules (actions) repertoire by each of the functions based on (2);

(4) – determination of the skills repertoire by each of the modules based on (3);

(5) – determination of the knowledge repertoire by each of the skills based on (4);

(6) – determination of the subject field repertoire by each of the knowledge based on (5).

Considering all this, the education content on the specialist training is formed.

For example, for functions of "Repair and rebuild" specialist, the following repertoire of modules – actions can be determined:

– types of conditions (situations) of educational and production processes which turned away from the norms;

– grounds (reasons) of data of the types of conditions (situations) of educational and production processes which turned away from the norms;

– complications caused by the data of the types of conditions (situations) of educational and production processes (health status of personnel, production, economic, environmental, social, etc.) which turned away from the norms;

– technical, technological diagnostics of the data of the types of conditions (situations) of educational and production processes which turned away from the norms;

– recovery (adequate choice of the recovery methods) of the data of the types of conditions (situations) of educational and production processes which turned away from the norms;

– carrying out of the recovery process of the data of the types of conditions (situations) of educational and production processes which turned away from the norms (adequate choice of the recovery methods carrying out);

– estimation of the obtained results;

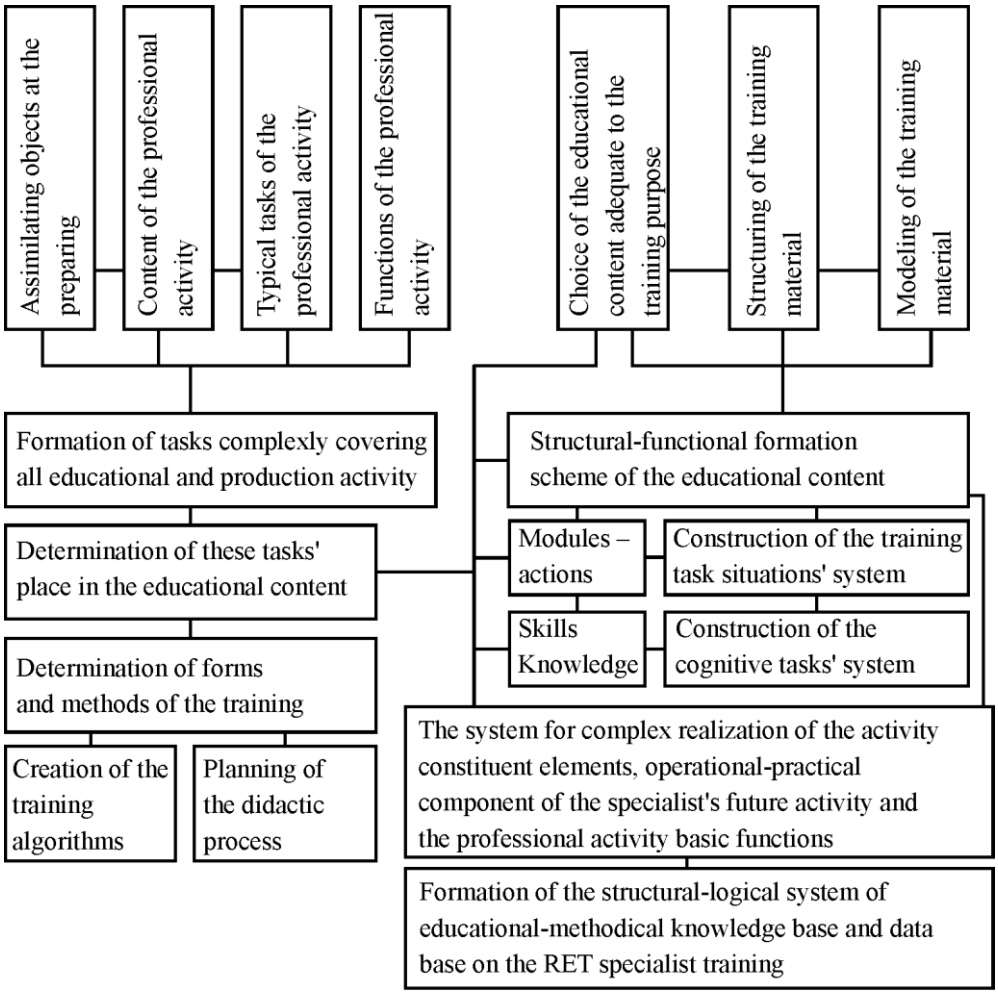
– adequate determination and carrying out of prophylactic actions to prevent repetition of the data of the types of conditions (situations) of educational and production processes which turned away from the norms.

The mentioned above modules – actions can be considered as the system of training situations and further, by skills and knowledge, determination of the cognitive problems related system for them.

Considering all mentioned above, a system for complex realization of the activity constituent elements, operational-practical component of the specialist's future activity and the professional activity basic functions is composed.

A structural-logical system of educational-methodical knowledge base and data base on the RET specialist training is formed on the ground of this system.

On the ground of all mentioned above, scheme 2 gives offered by us structural-functional scheme for the computer-informative development mechanism of the integrated model for the specialist's training and the teacher's conceptual-theoretical activity.



Scheme 2. Structural-functional scheme for the computer-informative development mechanism of the integrated model for the specialist's training and the teacher's conceptual-theoretical activity

Discussion

A. Saipov (2006) observes that the specialist's model and model of required knowledge should be necessarily developed for the personnel training. At that, G. Bowen (2016) confirms our thesis that there should be revealed content and structure of the teacher's methodical knowledge and examples of its demand in solution of partial methodical problems related to the development of trainee's cognitive activity.

International experience also proves our assumption that the development of the specialist's training model should be proceed from the following: firstly, incorporation of requirements to the development process of this model; secondly, consideration of conditions of its development; thirdly, necessity to form the specialist's logical-conceptual model; fourthly, the teacher's conceptual-theoretical activity mechanism development; fifthly, creation of computer-information development mechanism of the integrated model for training of the specialist and conceptual-theoretical activity of the teacher, etc. (Poshayev, 2012; Saipov, 2006).

Can note that in development of a methodical provision, the teacher solves three coordinated didactic problems: why teach (determination of a horizon of the professional knowledge and skills); what to teach (selection of the content and its planning); how to teach (ways and means for formation of the knowledge and skills) (Popescu & Stefan, 2014). All these aspects were taken into account during the creation of our integrated model for the specialist's training and the teacher's conceptual-theoretical activity.

Conclusion

In summary, the specialist's integrated model can be determined as an methodological basis for planning of educational process.

The scheme proposed in this paper reflects multidimensionality and transparency of the specialist's training and activity model as an integrated education.

As presented, application of offered by us development mechanism of the integrated model for the specialist's training and the teacher's conceptual-theoretical activity realized in the form of departmental computer-informative management technology for the specialist's training may compose a basis for technologization and informatiozation of the educational process and creation of real system of open education in a HEI.

Implications and Recommendations

Future specialist's training model is developed in order to sort out the major problems in teaching stuff preparation. Thus, research findings can be used as a basis for future investigations on creating an optimal model of educational staff development.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Akhmat Marasulov is a Doctor of Engineering, Professor at University "Miras", Shymkent, Kazakhstan.

Amangeldi Saipov is a Doctor of Education, Professor at M. O. Auezov South Kazakhstan State University, Shymkent, Kazakhstan.

Kulimkhan Arymbayeva is a Doctor of Education, Professor at M. O. Auezov South Kazakhstan State University, Shymkent, Kazakhstan.

Begaim Zhiyentayeva is a PhD, Associate Professor at L. N. Gumilyov Eurasian National University, Astana, Kazakhstan.

Akhan Demeuov is a PhD, Associate Professor at M. O. Auezov South Kazakhstan State University, Shymkent, Kazakhstan.

Ulzhamal Konakbaeva is a PhD, Associate Professor at South Kazakhstan State Pedagogical Institute, Shymkent, Kazakhstan.

Akbota Bekbolatova is a PhD Student at H. A. Yassawe International Kazakh-Turkish University, Turkistan, Kazakhstan.

References

Bowen, G. M. (2016). *Response to Section II: Practicing, Modeling, and Influencing Approaches to Teaching*. New York: Springer International Publishing, 174 p.

Carpenter, J., & Dickinson, H. (2016). *Interprofessional education and training*. New York: Policy press, 245 p.

Entonado, F. B., & Díaz, L. A. (2006). A training proposal for e-learning teachers. *European Journal of Open, Distance and E-learning, 9(2),* 155-167.

Kalimullin, A. M., & Masalimova, A. R. (2016). Editorial: Actual issues of national education: Theory and practice. *IEJME-Mathematics Education, 5,* 242 -253.

Klarin, M. V. (1995). *Innovations in the world pedagogics: training of the ground of research, games and discussions: Analysis of foreign experience.* Riga: Experiment, 263 p.

Marasulov, A. F. (2008). Model of educational process and training of specialists. *Journal of professional education, 3,* 14-15.

Marasulov, A. F. (2010). Structural-logic generalized model of a specialist's training and activity. In *Priority tasks of directions of technical and scoeial-economic sciences. Republican interuniversity collection of scientific papers*, 125-126.

Marasulov, A. F. (2014). Training model of future specialist in educational and production activity. *Materials of Republican scientific-practical conference "Priority directions of educational process improvement in training of engineering-pedagogical personnel in a higher educational institution".* Shymkent: Kazakhstan engineering-pedagogical peoples' friendship university, 4-5.

Markova, A. K. (1996). *Psychology of professionalism.* Moscow: Science, 352 p.

Passey, D., & Samways, B. (2016). *Information Technology: supporting change through teacher education.* New York: Springer

Popescu, A. M., & Stefan, M. A. (2014). Training the educator for methodological alternatives and paradigm changes in education. *Revista de Stiinte Politice, 43,* 171-183.

Poshayev, D. K. (2012). Teaching methodic of special disciplines. Astana: Nurbeine, 157 p.

Postnikova, P. G. (2004). Professional behavior of a teacher: psychological-pedagogical analysis. *Journal of Pedagogics, 5,* 61-63.

Radchenko, A. K. (1990). *Teaching methodic of machine-building disciplines and industrial training*. Training program for students of engineering-pedagogical specialty. Sverdlovsk: Education, 212 p.

Saipov, A. (2006). *Theoretical-methodological fundamentals of pedagogical integration in the system of artistic-occupational training of a future teacher*. Moscow: Institute of content and methods of education of Russian Academy of Education, 252 p.

Saipov, A., & Trigwell, K. (2015). Higher education teachers' professional learning: Process and outcome. *Studies in Educational Evaluation, 46*, 92-101.

State compulsory standard of education of the Republic of Kazakhstan. The higher education. Bachelor degree. (2008). *Basic provisions", approved by the order of the Minister of Education and Science of the Republic of Kazakhstan*, 26-27.

Shalayev, I. K., Sazonova, L. I. (2004). Motivational program-objective management as a methodological knowledge in pedagogical processes. *Journal of World of education – education in the world, 2,* 16-23.

Smirnova, Ye. E. (1977). *Formation ways of model of a specialist with higher education.* Leningrad: LSU.

Zholdasbekova, S., Nurzhanbayeva, Z., Karatayev, G., Akhmet, L. S., & Anarmetov, B. (2016). The Conceptual Model of Future Teachers Training to Dual Education in Vet (Vocational Education & Training). *International Journal of Environmental & Science Education, 11(7)*, 55-62.