

Innovative technologies for solving the problem of mastering the content of vocational education by future specialists in mining mechanical engineering

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Abstract. The article addresses the solution to the problem of assimilation of professional education content by future specialists of mining mechanical engineering. The efficiency of mastering the content of professional education of future specialists of mining mechanical engineering can be ensured on the basis of a contextual-modular approach: ideological and conceptual structuring of educational material; sufficient creation of a value orientation framework, which directly affects the educational material, the process of professional development and self-development of future specialists of mining mechanical engineering; establishment of subject-subjects in the process of professional training.

1 Introduction

For our study, the most significant one is that in realization of tendencies of development of professional education of future specialists of mining mechanical engineering a significant role is given to improvement of its content.

In our study, we have followed the approach to defining the content of education, which is offered by A.A. Verbitsky, N.N. Nechaev, G.N. Serikov. The duality of content manifestation in vocational education has been taken into account on the basis of this approach: first, as the content support of the educational process and, second, as the content of this process.

Considering the content of education of future specialists in mining mechanical engineering, we have also analyzed the requirements of the State Standard of Higher Training (SES) relating to the actual technical training of prospective mining mechanical engineering professionals, irrespective of their specialty. It clearly describes that the educational process should be built by all higher education institutions, taking into account the need to train students for the functions needed by the profession. A potential specialist in mining mechanical engineering, regardless of his or her other particular specialty, should be a professional with an understanding of the entire scope of the discipline in the widest sense of the term.

2 Materials and methods

The methodological basis of the study is as follows: the theory of professional education (S.Ya. Batyshev, A.N. Belyaeva, E.A. Klimov, etc.); axiological approach (E.V. Bondarevskaya, A.V. Kiryakova, O.V. Leshner, E.G., etc.); reflexive-activity approach (L.S. Vygotsky, V.T. Zinchenko, A.S. Vygotsky, A.V. Kiryakova, O.V. Leshner, E.G., etc.); and the reflexive-activity approach (L.S. Vygotsky, V.T. Zinchenko, A.S. Vygotsky, A.S. Vygotsky). N. Leontiev, et al.); a system approach (V.P. Bespalko, I.V. Blauberg, E.G. Yudin, et al.); a technological approach (V.P. Bespalko, P.Y. Galperin, M.V. Bespalko, M.V. Blauberg, E.G. Yudin, et al. Clarin); the theory of modular learning (T.V. Vasilyeva, N.B. Lavrent'eva, P.A. Yutsyavichiene, etc.); the theory of context learning (A.A. Verbitsky, N.N. Nechayev, etc.) [1,2,3,4,5,6,7,8,9].

The main methods of research were: theoretical analysis, study and generalization of the advanced pedagogical experience, pedagogical observation, sociometric methods, modeling, pedagogical experiment, modeling, synthesis, mathematical and statistical methods of processing the received data.

3 Results and Discussion

We understand assimilation as a psychological and pedagogical definition which implies a dynamic cognitive mechanism that occurs in the course of educational practices and reflects a deliberate mastery of the knowledge of past generations of people by students.

The solution of the problem of effective assimilation of educational content by future specialists of mining mechanical engineering involves the choice of theoretical and methodological strategy, methodical and technical tactics, as different approaches to addressing the issue can be used. Axiological, structural, technical and personal, reflexive and active, contextual, modular and contextual-modular are these, in our view. These methods, which involve scientific research apparatus and ideas for carrying out a particular research task based on a context-based module, complement each other and combine the best aspects in order to achieve our research objective. The approaches we choose are not just closely related; they reveal a certain unity among themselves. However, given our research focus, we have identified the context-module approach as the dominant one.

The implementation of modular organisation of the educational process enables time and means of training to be saved, the training process to be streamlined, the quality of educational outcomes to be increased, the study element of educational work to be enhanced allows introducing into practice the elements of individual "finishing" of a trainee to the necessary result of training [10,11,12,13].

Efficiency can be increased by growing of mastering the content of professional education of future specialists in mining mechanical engineering on the basis of complementarity of complementary approaches, learning technologies.

The context-module approach maintains the complex essence of the transition from educational to professional activities for students. (Fig. 1).

These requirements of the context-module approach are the basis for effective mastering of the content of vocational education by future specialists in mining mechanical engineering.

With this in mind, we offer a model of methodology for learning the content of vocational education of future mining mechanical engineering specialists based on the context-module approach, which includes four substructures: target, subjective, organizational, level-resulting.

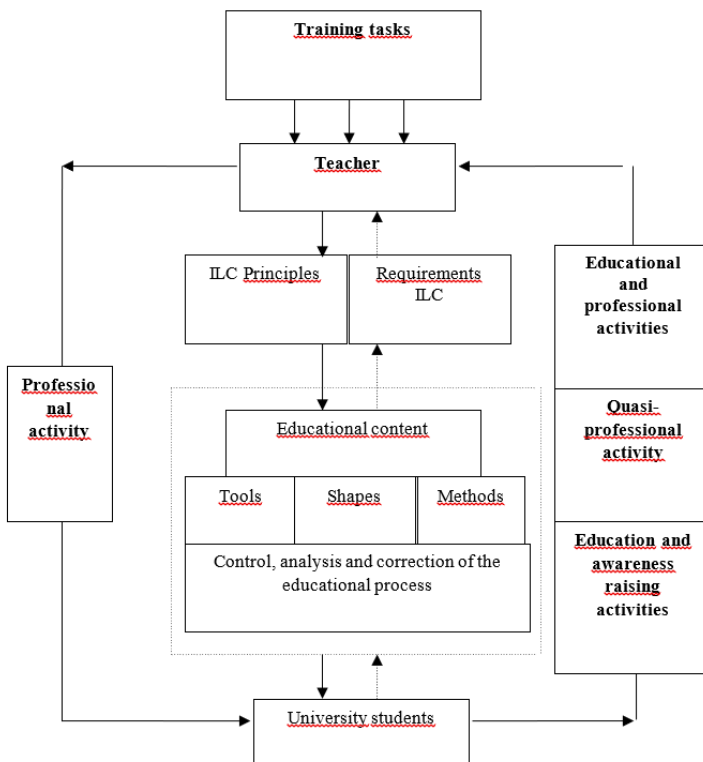


Fig.1. Scheme of educational process organization on the basis of context-module approach (IMP)

When constructing the model of the method of learning the content of professional education of future mining mechanical engineering specialists on the basis of context-module approach, we proceeded from the assumption that the model should reflect:

- the requirements set by the society to the quality the prospect of technical training mining mechanical engineering specialists;
- the main ideas of research on the problem of effective learning of professional education content for future mining mechanical engineering specialists on the basis of context-module approach;
- organization of the process of effective learning of professional education content for future mining mechanical engineering specialists, taking into account the educational conditions.

Justification of the model methodology of professional education content assimilation by future specialists of mining mechanical engineering on the basis of context-module approach.

Reasons for setting the goal: the requirements of the context-module approach are the basis for effective mastering of the professional education content by future specialists of mining mechanical engineering [14,15,16].

Objective: effective learning of professional education content by future mining mechanical engineering specialists based on context-module approach.

Pedagogical conditions for effective mastering of professional education content by future mining mechanical engineering specialists based on context-module approach:

- 1) ideological and conceptual structuring of the educational material;
- 2) formation of a system of value orientations that directly affect the professional development and self-development of future mining mechanical engineering specialists;

3) establishment of subject-to-subject relations between students and teachers, as well as among students in the process of professional training.

Principles of context-modular approach in mastering the content of professional education of future specialists in mining mechanical engineering:

1. The principle of completeness and comprehensiveness of educational material implies that the subject and social content of pedagogical activity is modeled using the whole system of didactic forms, methods and means.

2. The principle of designing a model for optimal transfer of information and methodical material. In accordance with this principle, professional learning is organized into separate functional blocks - modules designed to achieve specific didactic goals.

3. The principle of joint activities on the basis of parity presupposes a joint choice by teachers and trainees of optimal ways of cooperation in the educational process. The teacher and the student are not in subject-object interaction, but in subject-object interaction. Learning the content of professional education by future specialists in mining mechanical engineering is more effective when the student is as active as possible, and the teacher acts as a consultant-coordinator.

4. The principle of personality activity based on variation. The implementation of this principle means didactic and psychological conditions for the development of the comprehension of the doctrine and the inclusion of the student into it at the level of not only intellectual, but also personal and social activity.

5. The principle of problemness reflects a psychological and pedagogical pattern, according to which the efficiency of learning of educational material by future specialists of mining mechanical engineering is increased if such stimulating links as problem situation and practical orientation are introduced.

According to our proposed model of the method of learning the content of professional education for future specialists of mining mechanical engineering on the basis of context-modular approach.

4 Conclusions

So, our developed model of methodology of assimilation of the content of professional education of future specialists of mining mechanical engineering on the basis of context-modular approach has a structural organization and is presented in four substructures: subjective, target, organizational, level-resulting. The efficiency of mastering the content of professional education of future specialists of mining mechanical engineering the following collection of pedagogical requirements can be assured on the basis of a contextual-modular approach: ideological and conceptual structuring of educational material; effective creation of a value orientation framework, directly affecting the educational material; process of professional development and self-development of future specialists of mining mechanical engineering; establishment of subject-subjects in the process of professional training.

The result of the implementation of the model of the method of assimilation of the professional education content of future mining mechanical engineering specialists on the basis of the context-module approach was to promote the personality of the future specialist from low to medium, and from a high degree of assimilation of vocational education material.

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