

Fundamentals of Design of the Occupational Retraining Programs on the Basis of Interdisciplinary Integration

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Abstract: The study is dedicated to the effective method of occupational staff retraining interdisciplinary integration promoting to formation in the future specialists of knowledge, skills and qualities that allow solving different professional tasks under rapidly changing conditions in an integrated manner. The study specifies the fundamentals of design of the occupational retraining programs on the basis of interdisciplinary integration.

Key words: Professional retraining, integrated solution of professional task, interdisciplinary integration, educational program, training process, methods of implementation, interdisciplinary course, pedagogical conditions

INTRODUCTION

One of the main requirements imposed by the society to the system of basis vocational education is the necessity of formation in the future specialists of knowledge, skills and qualities that allow solving different professional tasks under rapidly changing conditions in an integrated manner. The studies (by the example of the degree program 'Tourism') show that currently only 20% of graduates of higher and secondary vocational education institutions are able to meet these requirements (Dzhamalova, 2009).

Among the most effective methods of formation of professional competences in specialists of any industry the researchers mention the supplementary vocational education performed by means of implementation of educational staff retraining programs (Pankina, 2005; Feiling, 2010; Khomutov and Tyunyaev, 2007).

Rationale: Today the theory and practice of supplementary vocational education recognize the necessity of rethinking of the traditional approaches to the forms of vocational retraining and improvement of professional skills, changes in the content of educational programs and improvement of pedagogical technologies ensuring the continuous process of formation of professional competences that are adequate to the modern economy.

Among the effective methods of formation of the content of supplementary vocational education programs one more and more frequently mentions the interdisciplinary integration that allows to successfully solve the issues of integrity of the professional activity.

Investigation of the fundamentals of interdisciplinary integration is dictated by the need to identify the most essential components of it that are required for effective design of the professional retraining programs on the interdisciplinary basis.

Analysis of the theory and practice of implementation of interdisciplinary integration in the basic and supplementary education programs: The issues of investigation of interdisciplinary integration were considered in the studies of famous national researchers: Verbizky (2004), Zverev (1977), Maksimova (1988), Makhmutov (1972), Makhmutov and Shakirzyanov (1985) and Fedorets (1989). Thus for example, Verbizky (2004) believes that the professional activity is integral and is ensured not by the explicit subject-related knowledge but by the system of it which necessitates the integration of academic disciplines. Makimova (1988) writes that the interdisciplinary knowledge in the vocational education have an important role to play in the increase in the level of scientific-theoretical and practical training of students.

Analysis of the theory and practice of implementation of interdisciplinary integration within the frameworks of the basic and supplementary vocational education programs shows that such integration allows solving the problem that that on the one part is related to the limited time allowed by the curriculum for the classes on the other part to introduction of the great volume of information required by a modern specialist. 'The essence of changes is the increasing role of the human knowledge in the area of related sciences and the ability to use it by solving the professional tasks in an integrated manner which will allow reduction the term of vocational education (due to

excluding the duplication of the material studied, laying emphasis on the most essential aspects thereof) and achieving 25-30% of saving the scope of educational services' (Bekrenev and Mikhelkevich, 1996).

The concept of interdisciplinary integration in the professional staff retraining: Today there is no single definition of the term 'interdisciplinary integration' within the pedagogical science. Thus, Shoshtayeva (2003) defines that this is 'the process of coordination of the community of academic disciplines in terms of representation of the integral, continuous and consistent phenomena of professional activity'; Chapayev (2005) believes that these are 'the processes of consolidation of academic disciplines with regard to the cognitive and technological issues'; according to Chebyshev and Kagan (1998), the essence of interdisciplinary integration consists in the fact that each cognitive problem features poly-disciplinary nature, it requires analysis and solution by means of the related disciplines and further integration of disciplinary solutions in the holistic view.

By designing of retraining educational programs on the basis of the previously published studies, we consider the interdisciplinary integration primarily as the process and result of interpenetration of content of different academic disciplines and formation of the single educational core that externalizes in the academic, practical and scientific-research activity of students. Following Smirnova (2015) that presented the interdisciplinary knowledge graphically with the use of the Euler-Venn diagrams, we believe that the interdisciplinary area features both the attributes and peculiarities of the scientific knowledge of the intersecting fields and its own specific features.

In the professional staff retraining interdisciplinary integration is expressed in interdisciplinary bonds that may act both as the method and condition of education or as the method of the training-cognitive activity and principle of the program design.

MATERIALS AND METHODS

Conditions of designing the professional training programs on the basis of interdisciplinary integration:

The methodological framework of application of interdisciplinary integration in professional staff retraining is the integrative method of vocational education the essence of which was described in the studies by Belyaeva (2002).

By designing of the retraining educational programs on the interdisciplinary basis it is primarily needed to specify the conditions of formation of the general scientific concepts. The main pedagogical, general

didactic and psychological conditions of formation of such concepts were distinguished by Chebyshev and Kagan (2000), among which there are:

- The time-matched study of separate academic disciplines by which each of them relies on the prior conceptual framework and prepares the students for successful adoption of concepts of the next discipline
- The necessity of ensuring succession and continuity in the evolution of concepts. The concepts that are common to a number of disciplines shall develop continuously shall be filled with the new content, enhanced with new correlations
- Consistent interpretation of general scientific concepts
- Excluding repetition of the same concepts by studying different disciplines
- Implementation of the single approach to description of the same categories of concepts

By designing of the retraining educational programs on the interdisciplinary integration may be implemented provided that:

- The subjects of the research match or are quite similar
- The same or similar research methods are used
- The disciplines are based on the common regularities, common theoretical concepts

We also distinguish from among the other pedagogical conditions:

- Design of the layered model of staff retraining
- Development of the research-methodological support of educational programs on the interdisciplinary basis
- Reflexive control of the training process
- Implementation of the comprehensive assessment of the efficiency of formation of professional competences

The designed programs shall feature an integrated didactic objective and the problem-modular content structure.

The layered model of the staff retraining on the basis of interdisciplinary integration may be presented as in Table 1.

Implementation of the professional retraining programs on the interdisciplinary basis is not possible without integration of the reflexive control technology. In our study, the structure of interaction between a pedagogue and student in the course of reflexive control is represented by such components as:

Table 1: Layered model of the staff retraining on the basis of interdisciplinary integration

Layer	Content of the layer components	Low	Average	High
Motivational-value	Features of motivation of activity	The teacher's motivation prevails	Pedagogue's motivation is necessary for self-motivation	Self-motivates prevails
Reflexive	Reflexive actions of a student	A student performs some reflexive operations	Pedagogue assists in the reflexive actions	Independent reflexive action prevails
Content-operational	Kind of activity	Reproductive	Searching	Subject-related
Effective	Nature of the pedagogue's actions	Simulated	Self-organizing	Self-motivating

motivational-value, reflexive, content-operational, effective characterized by indicators and levels of manifestation thereof.

RESULTS AND DISCUSSION

Methods of implementation of interdisciplinary integration in the professional staff retraining:

Experimental data show that any form of academic activity based on interdisciplinary integration provides positive educational results if it is implemented within the creative developing paradigm (integration according to the method) with the use of the unified technology of education (for example, modern information technologies) and unified communication methods (hermeneutics) (Smirnova, 2015).

The study performed shows that within the professional staff retraining interdisciplinary integration as a rule is implemented in Table 2.

Today, there are three main trends in establishment of interdisciplinary integration. Among them: consolidation of educational content of separate disciplines in the integrated courses; creation of the new disciplines of synthetic nature and creation of meta-disciplines (Timiryasova and Kramin, 2013; Gavrilova and Odarich, 2014; Kvasnykh, 2013; Kuchay, 2013; Zemlyansky and Sergeev, 2014; Bakharev and Bakhareva, 2014; Rodionov, 2014). Among the forms of implementation of interdisciplinary integration in the professional retraining we particularly distinguish the interdisciplinary courses.

In all above-mentioned cases, a new educational product is designed the implementation of which allows solving the following tasks in practice:

- Establishing the structure of the integrated scientific knowledge and creation of the unified system of sciences
- Formation of generalized, comprehensive skills
- Enhancement of the worldview orientation of cognitive interests of students, focusing attention on the interscientific issues
- Saving of academic time

For the purposes of successful design of the interdisciplinary course within the frameworks of professional staff retraining, we determine the following algorithm of actions:

- Specifying the purpose of integration
- Identification of the integration subject and components (knowledge, concepts, methods)
- Separation of the integrative core
- Establishing new relations between the integration subjects and components
- Testing of the newly formed system

Design of the structure of professional retraining program requires particular accuracy, orderliness and logical inter-dependence of the material studied in terms of different disciplines which is achieved due to the compacted, concentrated use of the educational material this is why as a rule, interdisciplinary courses are formed:

- From the content of disciplines of the same educational cycle where content of one discipline does not exceed that of another one
- From the content of disciplines of the same educational cycle when content of one discipline prevails over that of the others
- From the content of disciplines included in different educational cycles when content of one discipline does not exceed that of another one
- From the content of disciplines of different educational cycles when one discipline retains its specifics and the others act as the supporting basis

The interdisciplinary course shall ensure the continuous and comprehensive mastering of theoretical knowledge and practical skills; represent the unified system of knowledge; represent the great variety of interrelations within professional training, gradually increase the complexity of professional tasks with achievement of the creative level of fulfillment thereof; provide for different forms of organization of the learning activity; focus on the topical issues; feature the forward-looking nature.

The procedure of design of interdisciplinary courses within the frameworks of the professional retraining programs shall be determined by the specifics of the objectives and tasks of a particular program in the specific conditions of education where the learning objectives determine the selection of the professional competences of learners being formed, the subject areas for integration as well as training forms and methods. The methods of design of interdisciplinary courses depend on the goal-setting, the degree of involvement of the integrated

Table 2: Methods of implementation of interdisciplinary integration in the professional staff retraining

Organizational-activity-related integration	Content-related integration
Teaching by one pedagogue of two or three disciplines according to the integrated original programs. Introduction of specialty disciplines	Associative-conceptual and structural-content-related integration
Joint holding of separate classes in the same discipline by two or a few pedagogues representing different specialties	Applied orientation of education representing the diversity of options of using the knowledge acquired
Training interdisciplinary modules	Applied orientation of education representing the diversity of options of using the knowledge acquired
Academic-research work (term papers and graduation thesis), comprehensive academic-research works	Ensuring succession and continuity of the basic and supplementary education
Research work. Entering the schools of sciences	Integration of science and education
Practical training	Applied orientation of education representing the diversity of options of using the knowledge obtained in the practical activity
Systems of routine and summative assessment of the level of the student training quality	Formation of the system of knowledge of different disciplines

disciplines in the common topical field, nature interdisciplinary relations as well as on the developers' position.

By designing the interdisciplinary courses within the frameworks of the professional retraining programs one shall also take into account that the efficiency of education is achieved by means of forming the learners' competences relating to independent solution of professional tasks in the specially created pedagogical conditions (for example in conditions of a business game or within the frameworks of practical training).

Summary: The study performed allows estimating the role of interdisciplinary integration in the comprehensive solution of educational tasks and reduction of the term of the professional staff retraining.

CONCLUSION

It can therefore be concluded that in the new modern conditions of educational process the interdisciplinary integration may be used as the effective method of professional staff retraining by design of interdisciplinary courses.

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