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Integrative approach to designing the content of secondary specialized vocational education

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Abstract

The article discusses the issues of integrated approaches to the design of software content for vocational education. The study was conducted using the method of abstraction, ascent from the abstract to the concrete; logical analysis of scientific literature on the topic of the article; descriptive and diachronic. As a result, the integration of the learning process contributes to comprehensive learning, allows us to develop logical and figurative thinking in equal parts, supports rational and emotional areas of activity and ensures their unity. In conclusion, the need for integration is to bridge the boundaries between fields of science.

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Enfoque integrador para diseñar el contenido de la educación profesional secundaria especializada

Resumen

El artículo analiza los problemas de los enfoques integrados para el diseño de contenido de software para la educación profesional. El estudio se realizó utilizando el método de abstracción, ascenso de lo abstracto a lo concreto; análisis lógico de literatura científica sobre el tema del artículo; descriptivo y diacrónico. Como resultado, la integración del proceso de aprendizaje contribuye al aprendizaje integral, nos permite desarrollar el pensamiento lógico y figurado en partes iguales, apoya áreas de actividades racionales y emocionales y asegura su unidad. En conclusión, la necesidad de integración es cerrar los límites entre los campos de la ciencia.

Palabras clave: Integrativa, Enfoque, Basada en competencias, Pedagógica, Integración.

1. INTRODUCTION

Today, in the context of the continuous development of all spheres of life, the need for improvement in the field of education is simply obvious. And this, therefore, poses new challenges for pedagogical science, for example, changing the content of secondary specialized and vocational education. The integration of various fields of activity and the development of the informatization process is accelerating, and the number of information flows and innovations in the field of production and education is increasing. These processes make it necessary to constantly update the knowledge of college

graduates and improve the quality of their professional training to improve the qualifications of future personnel.

However, it is important to consider that the process of professional education is continuous; the graduate must constantly improve his professional competence (FOMINA, MAKAROV, ROSTOVSKAYA, KNYAZKOVA & BEREZA, 2018). Based on this, one of the main tasks of the training of future specialists in secondary specialized and professional educational institutions is the formation and development of modern professional competence (FOMINA, SIZIKOVA, SHIMANOVSKAYA, KOZLOVSKAYA & KARPUNINA, 2019). All this further confirms the need to improve the content of education and improve the quality of education through the integration of education, science and industry.

The competency-based approach is one of the 21st-century updates in the field of vocational education, the application of which will lead to a new approach in filling curricula, teaching methods and technologies (DAUPHINEE, BOULET & NORCINI, 2019). One of the key elements of renewal in education is the concept of competency. It reflects the integrative nature of the person, that is, the personal qualities of the future professional - knowledge, skills, practical experience, abilities and values. Competence provides and increases a person's readiness for professional activity. Now it is widely used in the implementation of Software Engineering and IT programs, medical and technical education (PUZANKOVA & BOCHKOVA, 2009).

In our opinion, integral education is important not only for the already mentioned areas of education, but first of all it is necessary for the future process of professional development and future professional activity. The essence of pedagogical integration is to combine the elements (content, forms, methods) of the educational process (MEDVEDOV, 2000). This is expressed in the expansion of educational functions (integrative function), innovative learning (integrative learning), modernization of education (integrative technologies) and learning outcomes (personal development) (OROZCO, GIJBELS & TIMMERMAN, 2019).

2. METHODOLOGY

Based on the analysis of the important characteristics of the concepts pedagogical integration, integration of educational content, integration in education, we have interpreted the integration of educational content.

A comprehensive analysis of the educational process was carried out taking into account the functions of pedagogical integration: methodological, developmental, technological. In turn, the methodological function of pedagogical integration is characterized by three dimensions:

- Heuristic (the ability of pedagogical integration to serve as the main support for the development of new pedagogical concepts);

- Axiological (integration as a tool for enriching participants in the pedagogical process intellectually and spiritually);

- Media (integration of pedagogy as a means of cognition and change in pedagogical science and educational practice, as well as a means of ensuring the consistency of old and new knowledge, theoretical knowledge and practical experience).

The content of the technological function of pedagogical integration includes compact information and time; identification of continuity in eliminating duplication, the development of knowledge and skills; integration of knowledge and skills acquired in a subject with knowledge and skills acquired in other subjects; systematization of concepts, arguments, skills, and competencies, as well as the rejection of certain knowledge and skills acquired in the formation of generalized integrative features.

The developing function of pedagogical integration extends to all areas of the theory and practice of education.

The study used several domestic and foreign scientific materials, educational programs, performance reports of college students and technical schools.

The study was conducted based on the following methods:

- Method of abstracting and ascending from the abstract to the concrete;

- Logical analysis of scientific literature on the topic of the article;

- Synthesis of generalized philosophical and scientific ideas, the ideas of integrating the educational content of programs and their impact on the learning process;

- Descriptive method;

- The diachronic method helped to consider the above concepts in their formation and development.

3. RESULTS AND DISCUSSION

The results of the analysis of scientific materials show that there are different views on the context of the integration of educational content. But, in our opinion, they do not contradict each other, but a compliment. It is worth noting that in some areas the views of scientists are close. All of them argue that there should be a significant proximity to the integrated components (EICHHORST, RODRÍGUEZ-PLANAS, SCHMIDL & ZIMMERMANN, 2015).

Now we should consider the methods of organizing and implementing the integrated learning process. One of them is the centralization method, the essence of which is that the development of knowledge systems occurs along the radius from the center to the surface. As the radius increases, the number of common ground between the subject grows due to various interdisciplinary knowledge. Thus, the subject under study becomes the center of integration of diverse knowledge (KHAIRULLINA, VALEYEV, VALEYEVA, VALEYEVA, LEIFA, BURDUKOVSKAYA & SHAIDULLINA, 2015).

The method by which the content of education can be formed is the spiral method. It is based on students' interest in learning, and more specifically on the integration of knowledge in the interests of students. Readers' interest in a particular subject causes a chain reaction of their interest in other topics. At the same time, there is a spiraling movement towards ignorance. Centralized and spiral approaches to the creation of integrated educational content show rather high efficiency (HUSSIN, 2017). However, it is much more likely to generate fragmented knowledge than systematic, but not fragmented knowledge in specific areas of scientific knowledge.

The logic of studying materials in modern colleges and technical schools moves from a simple to a more advanced linear action. This approach allows you to systematically acquire subject knowledge, but its main drawback is the weakness of interdisciplinary relations. In our study, we relied on the linear method of constructing

the integrative content of education. However, to ensure the integration of various subject knowledge in the design of the course content, in our opinion, it is necessary to follow the principle of parallel learning. This principle can be supported by a unified approach to the development of educational content.

The content of secondary specialized and vocational education is determined by state educational standards. The educational standards of the new generation are based on the practical orientation of vocational education, creative and pedagogical technologies, which increase the share of students' independent work, the principle of adaptation and the constant change in the curriculum and content of vocational education (FEDOROV & TRETYAKOVA, 2016).

One of the reasons for the need for integration in the context of education is not to establish boundaries between the fields of knowledge, including basic sciences. Among the reasons can also be identified as the requirements of state educational standards. This is because the state educational standard defines professional and general competencies, that is, knowledge, skills, and abilities that graduates should master. They can be achieved through an integrated approach to the development of basic training programs. The variational part of the program makes it possible to reflect the specifics of the educational institution, the specifics of the region and the needs of employers in this area who have specific professional competencies.

Besides, professional activity unites all other types of activity and therefore is called integrative activity. Progressive qualitative changes in the field of material production determine a specific strategy for preparing future competitive specialists for new integration activities. The integrated professional activity of specialists in these categories requires updating the content and the training process. The task of integrating the content of vocational education and mastering approaches to it allowed us to determine the levels of integration and clarify their functions aimed at creating an integrated picture of the world (Table 1).

Table 1: Integration levels

Level	**Level function**
Significant level	Deepening and improving theoretical knowledge, determining the relationship with practical professional activity, increasing the professional and personal motivation of students, interest in the profession and knowledge, the formation of critical, dialectical and alternative thinking, system knowledge and metadata.
Value level	Understanding the personal significance of the cognitive process, a rational approach to work and professional activity, a creative approach to professional activity, the possibility of development, manifestation, and activation of self-education and professional activity.

The main areas of integration of the content of vocational education are general and interdisciplinary, topics, sections, chapters, interdisciplinary integration. In the general direction, integrative horizontal connections are observed in all cycles of vocational education: general education, general professional and vocational (MINIAKHMETOVA, 2015). Defining and maintaining

interdisciplinary and interdisciplinary relationships is the main tool for introducing horizontal components of integration.

An interdisciplinary approach to the integration of the content of vocational education presumes integrity and a systematic understanding of the subject. This will help identify interdisciplinary relationships in the development of unified training programs and programs for the professional group and the wider special group. The interdisciplinary course of integration of the content of secondary specialized and vocational education is characterized by a systematic transition from the general laws of integration processes to private, methodological laws in the learning process (SHAIDULLINA, KRYLOV, SADOVAYA, YUNUSOVA, GLEBOV, MASALIMOVA & KORSHUNOVA, 2015).

The main issue here is compliance with the principle of structuring educational material. The emphasis is on the logical, scientific and professional definition of the content of vocational education; the relationship between theoretical and vocational education; coordination of skills and knowledge; transfer of general, professional and professional knowledge; unity of education and training, etc. Today, interdisciplinary research in pedagogical science is divided into three types corresponding to groups of scientific interactions.

The first type of interaction is the study of the same topic in different subjects of study. In this case, we are talking about adapting

the study of issues common to different subjects, eliminating the contradictions between the timing and logic of their study, a comprehensive study of objects and events and their relationship. The second type of interaction is the use of the same scientific method in different subjects. This approach provides a better understanding of cognitive and teaching methods. The third type of interaction is the use of the same theory in different subjects. General subjects are the basis for the study of specialized bloc disciplines and contribute to improving the quality of professional training (MINIAKHMETOVA, 2015). The study of disciplines in the professional unit strengthens, complements and deepens the knowledge gained by students in general subjects while navigating technology, production economics, and structure.

The point here is not to supplement courses in general subjects with professional material or vice versa, but to integrate the content, skills, and structure of various academic disciplines into the curriculum and synthesize subjective new knowledge. The synthesis of new subjective knowledge, in our opinion, should become the basis for the integration of academic disciplines. This can be considered as a criterion for successful integration. For example, various forms of integration in didactics offer the integration of educational materials of different disciplines into one course. However, the pedagogical experience shows that this method is ineffective. We strive to preserve the historically established system of studying disciplines.

The subjects should be relatively independent since each of them represents a certain field of science under its concepts, methodology, and subject of research. At the same time, they should be studied in unity and interconnection. This opportunity provides a learning approach in terms of multidisciplinary approaches. And this method can be considered as a form of integration of educational disciplines, a method of synthesis of subjective knowledge.

As a result of the transfer of knowledge from one subject to another to improve the student's mental activity, his or her personality changes. As a result of the transformation of the interconnectedness of scientific knowledge in the educational process, interdisciplinary knowledge and skills create students' creative abilities and their professional orientation.

Based on the experience of institutions of secondary specialized and vocational education, theoretical directions of integration of general education and professional training of future specialists, we have identified the main directions of integration of general education and professional education. This is a specialization in the content of general education, close to a certain group of professions (KHENNER, 2018). This aspect of general education allows students to determine the importance of the subject of study for them and creates a positive motivation for learning.

Batyshev mentioned the following areas of interaction in general education and vocational training: the cognitive aspect of

professional orientation related to the formation of professional skills; a worldview that allows students to form a system of views on nature, society, human relations; as well as the identification of leading ideas that influence the formation of personality, the moral and ethical aspect associated with the formation of a future employee or specialist. We agree with the need to work on these areas in the learning process.

The general criteria for choosing integrative content are the relevance of knowledge, skills and practical activities acquired in the course of training and production practice, their relevance to the level of professional motivation; the scientific and systemic nature of the training material; the logic of utterance; readability for students; taking into account age and individual characteristics of students.

One of the important principles of the content of vocational education is the integration of anthropocentric nature (SADOVNIKOVA & ZANNONI, 2018). Pupils act as subjects of integration, combining old and new knowledge and skills, practical experience, ideas, teacher's opinion, personal, subjective experience and problem situations. Only through active learning can knowledge be fully mastered. Therefore, when developing the holistic content of academic disciplines, it is advisable to take into account conditions that positively affect the synthesis of new knowledge.

Based on the analysis of various options for designing integrative content in academic disciplines, we found that there is no single algorithm for creating an integrated course and no single

approach to its construction. Problems and apply their professional competence not only in the narrow professional sphere but also in other types of activities.

The introduction of interdisciplinary levels of integration into the educational process, as well as interdisciplinary knowledge, gives students the motivation to learn and work, as well as integrate, compare, compare and develop skills. This, in turn, has a direct impact on the formation of future specialists' professional skills, knowledge, practical experience, and professional qualities, and also contributes to the development of professional interest. Thus, the following systemic effects of integrated vocational education:

- The ability of students to integrate knowledge and thinking skills into one or two disciplines;

- Integration of ideas that are far from each other in the process of creative professional activity and the ability to look at problems from an interdisciplinary point of view;

- The ability to solve complex problems and apply their professional competencies not only in narrow professional fields but also in other areas of activity.

4. CONCLUSIONS

The problem of the interdependence of various elements of vocational education is one of the important theoretical and practical

issues of modern didactics. As a result of the integrative organization of the educational process, students gain an understanding of the basics of directed activity, as a result of which they learn to think logically and figuratively. The knowledge that students acquire when studying the general form of training varies over time because they are studied at different times. In an integrated learning environment, they can navigate through various systems of knowledge and action. Thus, the integration of the learning process allows the simultaneous development of logical and figurative thinking, maintaining a rational and emotional sphere of activity and ensuring their unity. The need for integration is to bridge the boundaries between fields of science.

In our opinion, the interdisciplinary approach of pedagogical science at the modern level of development is the most optimal in the context of the integration of general educational, professional and professional disciplines in institutions of secondary specialized and vocational education.

The general criteria for choosing integrative content are the relevance of knowledge, skills and practical activities acquired in the course of educational and production practice in the study of subjects, disciplines, interdisciplinary courses, their relevance to the level of professional motivation; the scientific and systemic nature of the training material; the logic of utterance; readability for students; taking into account the age and individual characteristics of students. Since there is no general algorithm for constructing programs, the author's version is proposed in the article. This work contributes to pedagogical

science, the results we obtained are useful for developing training programs based on an integrative approach.

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