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INTEGRATIVE APPROACH TO THE TRAINING OF FUTURE PROFESSIONAL TEACHERS

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Abstract.

Relevance: the need to substantiate an integrative approach in the training of teachers of vocational training is determined by the integration processes of modern Ukrainian education, aimed at openness, the formation of a holistic picture of the world, integration into the national history, traditions, the Ukrainian culture.

Purpose: to determine the essence of integrated learning and to outline the specifics of the combination in the educational program of subjects of engineering and psychological-pedagogical cycles in the training of future teachers of vocational training.

Methods: theoretical (induction, deduction, generalization) for streamlining of scientific facts, establishing the relationship between different concepts; empirical (research, substantiation of pedagogical experience) for studying of educational programs of preparation of applicants of professional (vocational and technical) education and the account of their results in educational process.

Results: certain contradictions in the preparation of educational professional programs have been ascertained, the possibility of ensuring a parity of engineering and psychological and pedagogical disciplines in order to form future teachers of professional education engineering and psychological and pedagogical base has been identified; the implementation of integrated approach in the development and implementation of educational and professional training programs for bachelors in the specialty 015 "Vocational Education (Transport)" at the National Transport University has been substantiated.

Conclusions: It has been ascertained that integrated learning is one of the effective mechanisms to increase the level of professional training of future engineers-teachers through consistent and interconnected actions of a teacher and a student, which are aimed at forming a holistic picture of the world based on combining engineering and psychological-pedagogical disciplines; has been found that the specifics of the combination of engineering and psychological-pedagogical cycles in the training of future teachers of vocational training in educational programs consists of establishing interdisciplinary links, cross-cutting educational, technological and pedagogical practices, of creating integrated educational courses, of developing new forms of education, of implementing educational projects.

Keywords: integration, integrated professional training, future engineers-teachers, integration of professional-technical and psychological-pedagogical knowledge. institutions of professional (vocational) education.
**Introduction.** Reforming of the educational system of Ukraine, its integration into the European educational space has drastically affected the development of the entire education system, which has been lately aiming at providing proper conditions for quality training of competitive professionals in the global labor market. The transformation of these changes is determined by such factors as globalization, European integration and informatization of society. Currently, the domestic higher education gets renovated taking into account the provisions of a number of international agreements, according to which professional training of students from the degree of junior bachelor to doctor of sciences is incorporated into the system of higher education of Ukraine.

First of all, these provisions apply to the system of teacher training, which today form the intellectual potential of society and in which creative decision-making is a mandatory feature of their professional activity. It should be noted that among pedagogical workers, future engineers-teachers form a special category, whose professional activity is determined primarily by the state of the labor market whereto graduates of vocational education and professional higher education in certain specializations are about to introduce.

This system for vocational instructors’ training provides for the objective interdependence of professional training as a pedagogical component and account of the societal problems of science, technology and production; for the relationship of the formation of a developed personality with professional engineering training; for interaction of educational and production processes; for unity of integration and differentiation within professional training.

As far as the integration processes in the system of vocational education are concerned, leading specialists of the Institute of Vocational Education of the National Academy of Pedagogical Sciences of Ukraine emphasize that the main characteristics of this system are a combination of psychological and pedagogical and professional orientation at the first level "bachelor" along with continuation of in-depth study of psychological, pedagogical and professional disciplines at the master's levels (Radkevich, Romanova, and Borodiyenko, 2018, p. 8).

However, a distinction should be made between integration and integrated learning. The first generic concept (from the Latin. Integration – restoration, memory. Integer – whole) implies an adequate combination and joint action of individual parts of a holistic system, while integrated learning – a process based on a comprehensive approach to learning, when there is an integration of forms of training organization and teaching methods; combination of goals of training and education; knowledge of general education and purely professional sphere; integration of the national system of vocational education into the European educational space.

World practices demonstrate that engineering and pedagogical education is created at the edge of a natural combination of engineering and psychological and pedagogical education, which is why it features interpenetration, mutual enrichment of one field of knowledge into another, resulting in reasonable integration of psychological and pedagogical components in the training of teachers of engineering and technical disciplines.

**Sources.** The issue of integration in scientific research of scientists is revealed in various aspects, namely: the integration of psychological and didactic principles in the educational process (G. Ball, I. Bekh, L. Vygotsky, V. Zagvyazinsky, I. Zyazyun, O. Leontiev, S. Polyakov, V. Rybalka, E. Stones, N. Talizina, L. Friedman, etc.); integration of professions (Yu. Kravets, G. Lukyanenko, V. Melnyk, etc.); pedagogical aspect of integration of methods, forms, content of education (I. Kozlovskaya, P. Luzan, I. Yakovlev, etc.).

The analysis of scientific studies gives grounds to consider integration in education as a general scientific methodology. However, a single approach to defining the concept of "integration" has not yet developed. In our opinion, the definition of this concept proposed by L. Masol (2006, p.8) is relevant and valid: "Integration is a state of internal integrity, interconnectedness of differentiated parts and functions of the system, as well as the process leading to such a state. Integration is the formation or restoration of integrity, the highest form of interaction, because it involves not only interaction but also the interpenetration of elements ".

This concept is shared by the authors of the Encyclopedia of Education (2010, p.1040) who believe that "Integrative approach is implemented in the study of integrated courses or individual subjects in education, when the integrity of knowledge is formed by integrating them on the basis of common concepts, application of methods and forms of learning, control and correction of students' achievements thus directing the educational process to combine knowledge".

**Purpose:** to determine the essence of integrated learning and to outline the specifics of the combination in the educational program of subjects of engineering and psychological-pedagogical
cycles in the training of future teachers of vocational training.

**Methods:** theoretical (induction, deduction, generalization) for streamlining of scientific facts, establishing the relationship between different concepts; empirical (research, substantiation of pedagogical experience) for studying of educational programs of preparation of applicants of professional (vocational and technical) education and the account of their results in educational process.

**Results and discussion.** Evidently, integration processes in higher education are a priority in the overall development of education and aimed at achieving and implementing many principles of education: from forming a holistic picture of the world to implementing the principle of national orientation of education, integrating education with national history, traditions, Ukrainian culture, openness of education and in some way integration into the world educational space.

Indeed, vocational education is the center of science and culture, which transmits knowledge, skills and abilities (competence) to the younger generation, forms the worldview, culture, morals of each graduate – the future society. That is why it is so important not only to "equip" students with thorough professional knowledge, to form practical skills, abilities, relevant engineering and professional-pedagogical competencies, but also to implement a consistent model of training new generation teachers with personal worldview, developed culture, morals, humanities, values, ideals).

Recently, these problems have attracted the attention of both domestic and foreign educators, thanks to which partnerships are established and international cooperation programs are developed for vocational (vocational and technical) and professional higher education institutions. In particular, the National Transport University is involved in the Erasmus + project "New governance mechanisms based on partnership and standardization of vocational education in Ukraine" (PAGOSTE), the main purpose of which is the training of teachers working in vocational education and harmonization of vocational and technical expectations by educational institutions, motivation and competencies of future teachers, which are reflected in the content of an integrated combination of engineering and psychological and pedagogical disciplines.

Strategic tasks of integrated professional training of competent specialists in vocational (technical) education institutions are defined by Presidential Decrees, in particular: by the National Strategy for Education Development of Ukraine for the period up to 2021 (2013, s. 5); in the implementation of the goal of the Strategy of Sustainable Development "Ukraine – 2020" (2015, c.6), and by the Enactment of the Cabinet of Ministers of Ukraine "On approval of the National Qualifications Framework" (2011, с.7).

The Law of Ukraine "On Higher Education" (2014) regulates the implementation of the principle of international integration and integration of higher education in Ukraine in the European Higher Education Area and the development of scientific, scientific, technical and innovative activities of higher education institutions and their integration with industry. The Law of Ukraine "On Vocational Education" (1998) define the main task of meeting the needs of the country's economy in skilled and competitive workers in the labor market which nowadays requires integrated professional training of teachers and is supposed to provide a combination of professional and psychological-pedagogical components.

These components can be best combined in the preparation of didactic projects, "because they provide an opportunity to simultaneously develop both engineering skills and psychological and pedagogical" (Bakhtiyarova and Romanova, 2020, p. 8). Many opportunities for the implementation of integrated learning are provided by the dual form of education, which has recently become more widely used.

However, the ideas of integration face some difficulties at compiling educational programs, when it is necessary to maintain a parity of engineering and psychological-pedagogical disciplines, because the sui generis of drafting programs of professional technical and pedagogical training for engineering and pedagogical staff places general training at the beginning, then knowledge gets split through advanced study of elements of professional activity, which are organically combined in the content of educational programs to be founded on the principle of "cyclical regularity".

As you know, the basis for developing an educational program is the State Standard of Higher Education, according to which any educational and professional program determines the prerequisites for access to education, ECTS credits, list of general and special (professional) competencies, content of training formulated in terms of learning outcomes, and quality control requirements for higher education. Thus, specialty 015 "Vocational Education" at the National Transport University (NTU) takes into account the scope of educational and professional...
program on the basis of complete general secondary education 240 ECTS credits. On the basis of the degree of "junior bachelor" (educational qualification level "junior specialist") whereby an institution of higher education has the right to recognize and offset:

- at most 120 ECTS credits received within the framework of the previous educational program for the preparation of a junior bachelor (junior specialist) in the specialties of the field 01 Education/Pedagogy and specialties corresponding to the specialization for which the training is carried out;
- at most 60 ECTS credits received within the previous educational program of bachelor's degree in other specialties. At the same time, according to the Standard of Higher Education, 50% of the educational program is directed to the acquisition of general and special (professional) competencies in the specialty.

The implementation of integrative approach during the educational process is based on the systematic application of interactive technologies, in particular, level differentiation, development of critical and professional thinking, module-block learning, project learning technology, distance learning. Practical training is end-to-end, involves students of educational, technological and pedagogical practices.

A common practice within the integrative approach is the interdisciplinary approach, which is organized on the principle of creating extended educational programs; preparation of integrated educational courses; development of new forms of learning organization (classes with interdisciplinary links, integrated webinar, web quest, business game, binary training); implementation of educational projects. Interdisciplinary integration links strengthen the interaction of all didactic principles in the real learning process. In any didactic system, built on the principle of interdisciplinary, all stages (links) of interaction between a teacher and a student are rebuilt, so the technology for holding of integrated classes may vary. It depends on the goals, objectives and content of the lesson, methods of activity, situations that arise in the process of its implementation and in most cases have a procedural structure (purpose – motive – content – means – result – control).

It should be noted that the main trends in the use of integration processes are the desire to reduce the amount of educational and program documentation; use of a differentiated approach to determining the levels of qualification, licensing of new professions; creating attractive learning conditions through the expansion of laboratories equipped with the up-front technical aids; expanding opportunities for the formation of creative, physically and morally healthy, educated personality, the disclosure of its abilities; meeting the growing educational and cultural needs.

In terms of content, thematic integration is implemented as the selection and integration of cross-cutting components of the content of education: general, polytechnic and special, which form the basis for mastering professional disciplines, cross-cutting components of which form the basis of any subject. In the training of future specialists in the specialty 015 "Professional education (Transport), this is manifested, for example, in the simultaneous conduct of practical classes in technical disciplines with multimedia support of didactic provisions of the organization of training, justification of didactic principles used; checking the formation of both professional and pedagogical competencies or pedagogical justification of appropriate forms of control of knowledge, skills and abilities.

For the record, during the pedagogical practice on the basis of the Educational and Scientific Center of Vocational Education of the National Academy of Pedagogical Sciences of Ukraine, students of vocational education of NTU profited from conducting classes under the guidance of leading teachers of the institution. While preparing summaries of classes on road transport industry, students in addition to presentation of new material, focused on the didactic conditions of structuring educational material and the development of business communication skills, paid attention to technical analysis of certain provisions using methods of scientific and pedagogical research. In doing so a multimedia projector, an interactive whiteboard, a laptop, car equipment, fragments of educational films, etc. were widely used. With regard to technological practice, the heads of professional engineering departments often focus their efforts only on the acquisition of research and production experience, on the formation of practical skills and skills in working environment and, unfortunately, in most cases do not use integrative approach to goals, objectives and content of practice.

Such a state of integrated professional training of future engineers-teachers is exacerbated by the shortcomings of pedagogical theory and practice, among which there are certain contradictions between:

- the requirements set by the international community, one the one hand, and the domestic requirements applicable to the qualification level of future specialists at professional colleges and institutions of vocational education;
the current need to create an effective innovative system of integrated professional training of future professionals with due regard for modern innovations, technical and technological changes, structural and semantic production transformations, on the one side, and insufficient development of pedagogical technologies and methods of professionally integrated learning on the other side;

the need to increase the level of pedagogical skills of teachers of vocational education for the implementation of integrated professional training and discussion of these issues in advanced training courses for teachers and masters of industrial training;

the existing need to provide students with knowledge on different trajectories of training, on future activities based on openness, continuity of education and, on the other hand, absence of this important point in the regulations applicable to the training of future teachers.

Based on the multifaceted analysis of the category "integrative approach in education" it can be stated that it is a multifaceted, multidimensional, multifunctional category, that is why the implementation of an integrated approach requires the definition of such concepts as: integrated learning; integration of professions; integration components of content, forms, methods; integrated technologies, etc. In addition, we consider it necessary to create a methodological system that would indeed combine all the requirements and principles of integrated training, create pedagogical conditions for the formation and development of "integrated competence" (generalized description of qualification level, consisting of general and special competencies and conforming to expected program based training outputs “On approval of the action plan for the implementation of the National Qualifications Framework for 2016–2020." ) This already requires urgent and painstaking work on further improvement and development of vocational education.

Conclusions. Theoretical analysis of educational regulations, curricula for training of students studying at NTU in the specialty 015 "Vocational Education (Transport)" and generalization of their own pedagogical experience gave grounds to recognize that integrated learning is a set of consistent and interconnected actions between teachers and students, aimed at forming with future professionals a holistic picture of the world by combining in the curriculum a list of disciplines that provide both general education (cycle of humanities, socio-economic and fundamental disciplines), polytechnic (professionally-oriented disciplines) and special (professional-practical disciplines) training. And this, in turn, requires pedagogical skills and a sufficient professional level of work in higher education, preferably with some experience in the relevant industry.

Pedagogical practices demonstrate that the use of integrated learning opportunities in the educational process not only helps students to fully and deeply master the material, but it allows teachers to "go" beyond a particular subject (a particular educational field) and thus helps future professionals to expand the understanding of different areas of human activity, promotes the development of analytical, synthetic and thinking skills and abilities.

Since the processes of integration in technical (vocational) education are a pattern based on a combination of vocational and psychological and pedagogical knowledge, we consider it appropriate to train a contemporary engineer-teacher for integrated training in certain specializations. At the same time, the implementation of the provisions of integrated professional training for future specialists requires a special methodological and technological basis that will ensure the effective functioning of such a system.

Thus, there exists an urgent need to develop methods and technologies for integrated learning; to elaborate distance learning courses to improve the professional skills of teachers and masters of industrial training, to put in place professional standards of integrated professions by qualifications, in accordance with the National Qualifications Framework and, on their basis, to draw up educational and professional programs for integrated training of future professionals.

List of references


Translated & Transliterated


IHТЕГРАТИВНИЙ ПІДХІД У ПІДГОТОВЦІ МАЙБУТНІХ ПЕДА-ГОГІВ ПРОФЕСІЙНОГО НАВЧАННЯ

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Реферат:
Актуальність застосування інтегративного підходу у підготовці педагогів професійного навчання зумовлена інтеграційними процесами сучасної української освіти, спрямованими на відкритість, формування цілісної картини світу, інтеграцію з національною історією, традиціями, українською культурою.

Мета: визначити сутність інтегрованого навчання у підготовці майбутніх педагогів професійного навчання та окреслити специфіку поєднання в освітній програмі предметів інженерного та психолого-педагогічних циклів.
Методи: теоретичні (індукція, дедукція, узагальнення) – для систематизації наукових фактів, встановленні взаємозв’язку між різними поняттями; емпіричні (дослідження, обґрунтування педагогічного досвіду) – для вивчення освітніх програм підготовки здобувачів професійної (професійно-технічної) освіти та врахування їх результатів в освітньому процесі.

Результати: визначено суперечності при складанні освітніх професійних програм, можливості забезпечення паритетного співвідношення інженерних та психолого-педагогічних дисциплін з метою формування у майбутніх викладачів професійної освіти інженерної та психолого-педагогічної бази; обґрунтовано інтегрований підхід при розробленні та реалізації освітньо-професійної програми підготовки бакалаврів зі спеціальності 015 «Професійна освіта (Транспорт)» в Національному транспортному університеті.

Висновки: визначено, що інтегроване навчання є одним із дієвих механізмів підвищення рівня професійної підготовки майбутніх інженерів-педагогів за рахунок послідовних та взаємопов’язаних дій викладача й здобувача освіти, спрямованих на формування цілісної картини світу на основі об’єднання змісту інженерних і психолого-педагогічних дисциплін; з’ясовано, що специфіка поєднання в освітній програмі предметів інженерного та психолого-педагогічних циклів у підготовці майбутніх педагогів професійного навчання полягає у встановленні міжпредметних зв’язків, наскрізності навчальної, технологічної і педагогічної практик, створенні інтегрованих освітніх курсів, розробленні нових форм організації навчання, впровадженні навчальних проєктів.

Ключові слова: інтеграція, інтегрована професійна підготовка, майбутні інженери-педагоги, інтеграція професійно-технічних та психолого-педагогічних знань, заклади професійної (професійно-технічної) освіти.

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