Western European Journal of Linguistics and Education
Volume 2, Issue 11, November 2024
https://westerneuropeanstudies.com/index.php/2
ISSN (E): 2942-190X Open Access| Peer Reviewed

TASKS WITH AN INTEGRATIVE CONTENT AIMED AT DEVELOPING STUDENTS' PROFESSIONAL COMPETENCES AND REQUIREMENTS FOR THEM

Ismoilov Elmurod Olloberdi o‘g‘li

Associate Professor, PhD, Tashkent State Pedagogical University

named after Nizami

Abstract. This article details the concepts of science integration and integrated education, as well as the importance of an integrative approach to the educational process. The content of materials on the development of professional competence of students and the principles of their selection are given. The analysis fully justifies the need to use the integration of disciplines in the education system to develop students' professional competencies.

Keywords: competence, professional competence, integration, integration of disciplines, integrative approach, level of integration, curriculum, interactive method, professional adaptation, professional formation.

An analysis of educational, methodological, didactic, and scientific literature on the content of materials for the development of students' professional competence based on an integrative approach and the principles of their selection revealed that the use of these selected materials in the educational process creates ample opportunities for improving the content and quality of educational work, as well as for the formation of theoretical knowledge, practical skills, and qualifications in students. Based on an integrative approach, selected materials for the development of students' professional competence should address the following issues:

1. It is necessary to clarify what traditional and non-traditional methods and forms should be used in lectures and practical sessions to increase the effectiveness of teaching selected materials for the development of students' professional competence.

2. The content of the selected materials for the development of students' professional competence should be expressed in simple, short, concise, and most importantly, complete text.

3. The content of the selected materials and the facts contained therein must be truthful.

4. The content of the selected materials and test questions must be clear and understandable.

Since ancient times, there have been slowdowns in the development of knowledge in independent (for example, nature, society, human thinking) and diverse areas. By the end of the 20th century, the beginning of the process of integration of sciences allowed to prevail in relation to differentiation. If earlier new sciences appeared due to the separation of knowledge, now they began to emerge again due to interactions, integration of knowledge (biogeochemistry, biophysics, microelectronics, plasma chemistry, etc.). They emerged with the deeper penetration of basic sciences (mathematics, physics, biology, philosophy, etc.) into

Western European Journal of Linguistics and Education
Volume 2, Issue 11, November 2024
https://westerneuropeanstudies.com/index.php/2
ISSN (E): 2942-190X Open Access| Peer Reviewed

the field of applied research. To date, 70% of countries in the world use curricula and textbooks of an integrative nature in their education systems. In the UK education system, mainly integrative sciences have been introduced. In the Netherlands, separate subjects are taught, in Ireland, all disciplines are integrated in science and technology blocks. In Australia, integrated sciences are taught, and in Japan, Northern Ireland, Wales, Hong Kong, and Germany, integration is taught as a separate subject. In Korea and Switzerland, integrated subjects or subjects are taught separately. In Uzbekistan, initial steps are currently being taken in this area. As a result of the use of educational integration, favorable conditions are created for the implementation of educational goals in pedagogical and psychological terms; general didactic requirements are fulfilled in a coherent manner; the student's time and energy are saved; excessive mental and physical stress is prevented, and educational efficiency increases. Students have the opportunity to comprehensively master the necessary skills and competencies, concepts and knowledge as a result of harmonizing the content of educational subjects. Integration of the content of the educational process is the process of establishing connections between the structural components of the content within a certain system of education in order to form holistic concepts of the world, aimed at the development of the student's personality and self-development. According to J.B. Ergashev, integration is a process that implies the interconnection of separate parts of a system, a whole organism that differ from each other and leads to the same state. According to the description of N.M. Ahmedova, integration is emphasized as developing in an interconnected manner, uniting into a whole, making it whole. Integration is the process of combining different parts and elements into a single whole. Integration processes can occur in organized systems - in this case, they increase the level of integrity and organizedness of the system. According to A.I. Avazboyev and Ya.U. Ismadiyarov, integration is a process of unified worldview, logical-methodological interaction of the components of a particular science, leading to their unification and integration. At the current stage of scientific and technical development, the integration process prevails over the differentiation process. The differentiation of scientific knowledge is of certain importance in the development of science and technology, but it does not have a decisive role. This task is performed by the process of integration of scientific knowledge.

As applied to the education system, “integration” as a concept has two meanings: firstly, it creates a holistic view of the world around students (here integration is considered the goal of education), and secondly, it finds a common platform for the convergence of subject knowledge (here integration is a learning tool). In practice, the integration of knowledge is used more often without a goal. Long-term observations show that students studying general vocational subjects have difficulties in learning mathematics, computer science and physics, in applying knowledge, skills and competencies. They do not have the ability to think independently, apply the acquired knowledge to similar problems or transfer it to other situations.

There is no sequence or consistency in the teaching of subjects in higher education institutions, and the working programs of general and specialized subjects are not coordinated during the study period. Therefore, a number of misunderstandings arise, such as duplication of educational materials, violation of the logical sequence of studying relevant sections, and imbalance of conditions.

Western European Journal of Linguistics and Education
Volume 2, Issue 11, November 2024
https://westerneuropeanstudies.com/index.php/2
ISSN (E): 2942-190X Open Access| Peer Reviewed

R.V.Salomova believes that integrated teaching of subjects creates the opportunity to study their related topics simultaneously and in a way that is interconnected. Integration is a new approach to teaching subjects. Such lessons allow saving time due to the fact that the educational materials of different subjects complement each other. The main methods of integration are:

- classes are held in connection with topics in other subjects;
- lessons are conducted in the form of creative laboratory work;
- lessons are supplemented with electronic information educational resources.

We emphasize that integration in the educational process is both within a specific subject and interdisciplinary, and its implementation in classroom activities serves as a process of integrative approach (Figure 1 shows integration in the educational process and its types).

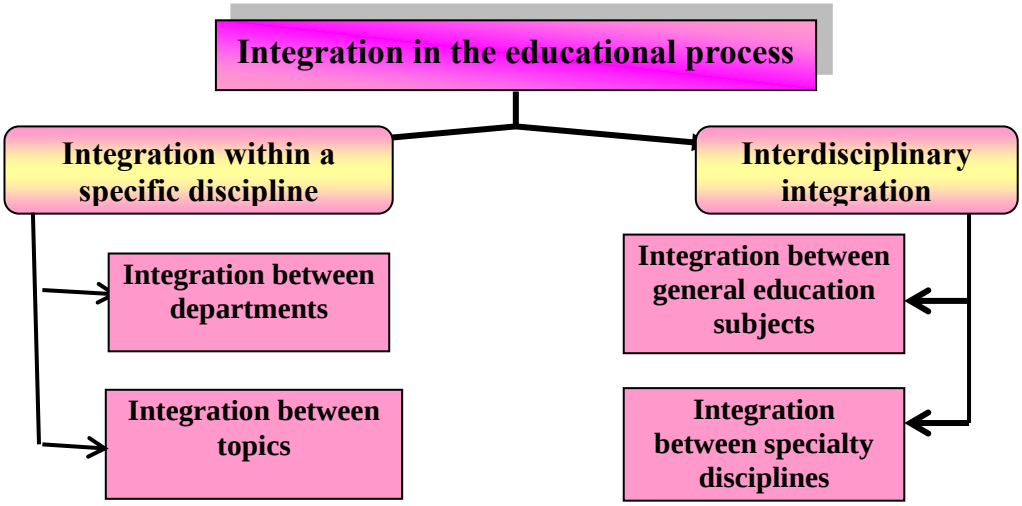

Figure 1. **Integration in the educational process and its types**

The integrative approach is used to integrate academic disciplines that are coherent in content, related, logically interdependent, and interpenetrating, deepening, and expanding, to form a holistic, logically complete body of knowledge, methods of action, and personal qualities.

Summarizing various approaches, we can consider integration as a process of interaction of structural elements of individual disciplines with the growth of their unity and complexity on a single ideological and logical-methodological basis. From this point of view, the integration of disciplines should be considered as a system with an appropriate structure and as an objective process with different stages of development. The integrative approach, on the other hand, is based on the consideration, reliance, integration of knowledge, skills, qualifications and experience obtained from the mastery of various disciplines, communication in foreign languages, professional formation, professional adaptation, professional communicativeness, and the simultaneous development of professional competence. There are two directions for implementing controlled knowledge integration. The first has a traditional description, in which the teacher considers the connections that naturally arise from the content of educational materials in two or more scientific disciplines over a certain period of time. The second direction, as the basis for the integration process, consists in selecting a specific set of

Western European Journal of Linguistics and Education
Volume 2, Issue 11, November 2024
https://westerneuropeanstudies.com/index.php/2
ISSN (E): 2942-190X Open Access| Peer Reviewed

knowledge and skills that does not strictly correspond to the boundaries of the disciplines of the institutes of any technical direction.

The main tool for the integration of mathematics, computer science, and physics - professionally oriented tasks that reflect knowledge from different areas in an interconnected manner - was noted by P.G. Kulagin, N.A. Loshkareva, and G.F. Fedorets.

According to V.A. Dalinger, inter-sectoral communication is necessary to create professionally oriented tasks. If the definition of "inter-sectoral communication" is studied, then it can be seen that there is no interpretation of the definition, role and significance of intra-sectoral communications in the pedagogy of vocational education. Students of higher educational institutions must have systematic knowledge, skills and qualifications in studying various disciplines. The connections between the components of mathematics, computer science and physics are diverse and depend on the composition of the elements between them. Through the facts, phenomena, concepts, categories, rules, formulas, schemes identified between various components of the education system, it is possible to identify many connections established between disciplines. These connections arise between the "informative" or informative sides of a scientific subject. At the same time, each discipline has different components: the language of science, research methods, theory, applied part, exercises and tasks that form a certain structure of the discipline. The process of integration of connections occurs as a result of the formation of general and theoretical concepts or methods of solving practical problems in independent fields of knowledge. Thus, the integration of knowledge contributes to the realization of new theoretical and practical results and an increase in the level of training of specialists. Inter-disciplinary connections allow us to determine the logical and semantic levels of integration of general and specialized disciplines in higher educational institutions (see Table 1).

Table 1.

Integration of general and specialized disciplines

№	Block of sciences	Block sciences	Integration levels
1.	General professional subjects	Drawing geometry and engineering graphics. Theoretical mechanics. Metrology, standardization and interchangeability. Materials science and construction materials technology. Electrical engineering and electronics. Thermodynamics and thermal engineering.	Logical

Western European Journal of Linguistics and Education
Volume 2, Issue 11, November 2024
https://westerneuropeanstudies.com/index.php/2
ISSN (E): 2942-190X Open Access| Peer Reviewed

2.	Specialty subjects	Construction of automobiles and tractors. Fundamentals of the theory of internal combustion engines. Fundamentals of testing, operation and service of automobiles and tractors.	Semantic

According to M.J. Turdiyeva, since the educational process is supposed to be organized on the basis of integrative programs and textbooks, it is advisable to use different levels of integration. Including:

1. Integration based on the sequential presentation of topics, in which the principle of concentricity is followed in presenting educational materials. That is, the previous educational material complements the next. But it never repeats each other. As a result of such an integrative approach, students' knowledge, skills and abilities, as well as creative activities, are systematically developed and enriched.

2. Integration based on creating points of mutual harmony in the curricula; in this case, it is also important to ensure inter-thematic harmony in the curricula to avoid repetitive tautological teaching materials. The advantage of this is that the student's time and effort are saved, the volume of textbooks is compacted, and the cost is reduced.

3. Modular integration: within the framework of such integration, knowledge and concepts related to related academic subjects are integrated into a single system and presented to students in an integrated manner.

4. Integrative programs: These types of programs involve the integrated presentation of several subjects or topics related to academic disciplines. Given the fact that the number of subjects in the curriculum has increased to the maximum, there is a strong need to create such programs.

5. Cross-curricular integration: in which learning materials provided within the same course are integrated with similar learning materials within another course.

According to M.P. Imomov, the integrated study of specialized subjects in the training of junior specialists in mechanical engineering vocational colleges has the following advantages:

- to optimize the content of education, to comprehensively and thoroughly study issues that are important in the activities of future junior specialists;
- to ensure the consistency and harmony of the educational, educational and developmental goals of the training;
- to "transfer" the acquired knowledge and professional methods of action to previously unknown situations and circumstances, that is, to form logical thinking, independence and creative abilities in students, and in general, to improve the quality of training junior specialists.

In the process of teaching mathematics and natural sciences, it is possible to develop such intellectual abilities of future specialists as general analysis, synthesis, establishing logical relationships, and determining functional relationships in processes. In educational activities, students have a clear attitude to various topics based on general motivation. The orientation of

Western European Journal of Linguistics and Education
Volume 2, Issue 11, November 2024
https://westerneuropeanstudies.com/index.php/2
ISSN (E): 2942-190X Open Access| Peer Reviewed

the topic to professional education is determined by the interest in a particular field of knowledge and the importance of such abilities as adaptation to the quality of education, mastering the object, etc. Methods of teaching mathematics and natural sciences should include the following:

- professional and practical relevance;

- integration of mathematical and natural sciences with general and specialized disciplines;

- cognitive performance of students using mathematical programs;

- stimulation.

The main educational methods used in the implementation of the competency-based approach include problem-based teaching, raising problematic issues related to the involvement of knowledge from other disciplines; working with software, and performing complex tasks using textbooks and additional literature from various disciplines. These methods are coordinated with the process of interdisciplinary integration, and almost all disciplines have a unique integration potential, but their unification depends on many conditions. Therefore, before proceeding with the implementation of the integration of mathematical and natural sciences with general and specialized disciplines, it is necessary to take into account the conditions under which it is possible to conclude that integration is necessary and possible: firstly, it is necessary to analyze the level of preparation of the student groups, to know their psychological characteristics, to assess their interests, and secondly, it is necessary to explain that the successful study of one subject by students depends on their knowledge and skills in another subject.

There are countless connections in the world, and each connection should not harm the others. Practice shows that in the programs of many disciplines, there are several “points” where topics and problems devoted to the study of the same phenomena are similar. In order to develop the professional competence of future specialists, it is necessary to develop appropriate educational technologies based on the integration of mathematical and natural sciences with general and specialized disciplines, taking into account the organization of the activities of teachers and students. In the study of P.V. Kiyko, the use of computer programs in mathematics lessons was proposed as one of the forms of training. When performing tasks in the classroom, students are able to conduct independent research, plan, forecast, create analytical models, and process experimental results. With the help of computer programs, students see the interaction of mathematics with computer science and physics, and evaluate the important advantages of using information and computer technologies in solving professional problems. As a result of such teaching of higher mathematics, future specialists realize its importance and their interest in mathematics increases. The dependence of higher mathematics on computer science and physics and the possibility of using modern programs to solve technical problems encourage them to research.

In conclusion, the combination of teaching forms, which implement the integration of mathematics and natural sciences with general and specialized disciplines, the use of integration at different levels and directions, helps to develop the professional competence of future specialists. The specific features of the organization of the educational process, the

Western European Journal of Linguistics and Education
Volume 2, Issue 11, November 2024
https://westerneuropeanstudies.com/index.php/2
ISSN (E): 2942-190X Open Access| Peer Reviewed

integration of mathematics and natural sciences with general and specialized disciplines serve as the basis for the development of professional competencies that contribute to the formation of professional knowledge.

References:

1. Ismoilov E.O. Use of information technologies and computer mathematics systems in the process of teaching the subject of differential equations // Eurasian Journal of Physics, Chemistry and Mathematics (EJPCM) (ISSN 2795-7667) (Journal impact factor 7.825). – Belgium, volume 17, № 4, April 2023. – p. 63-68.

2. Turgunbaev R.M., Kushmurotov U.I. Thesaurus approach: on the formation of mathematical competence and competence of future engineers // Current research journal of pedagogics. February 2021. – p. 26-33.

3. Ismoilov E.O. Development of students' professional competence on the basis of career-oriented tasks formed on the basis of an integrative approach // World Conference on e-Education, e-Business and e-Commerce. – Coimbatore, India. 19th March 2022. – p. 38-41.

4. Тургунбаев Р.М. Принцип преемственности в обучении математическому анализу с помощью специально подобранных задач // Физико-математическое образование. Февраль 2021. – с. 77-82.

5. Ismoilov E.O., Tangirov A.E. Opportunities to develop students' professional competencies based on the integration of disciplines // International Journal on Integrated Education (ISSN 2620-3502) (Journal impact factor 7.242). – Indonesia, volume 5, Issue 3, March 2022. – p. 36-44.

6. Жаров В.К., Тургунбаев Р.М. Проблема преемственности в методике преподавания математики и ее интерпретации в современных образовательных школах // Вестник РГГУ. Серия: Информатика. Информационная безопасность. Математика. Июнь 2019. – с. 52-74.

7. Ismoilov E.O. The content and methodological features of an integrated approach to the formation of professional competencies in students // Eurasian Scientific Herald (ISSN 2795-7365) (Journal impact factor 8.225). – Belgium, volume 7, April 2022. – p. 109-114.

8. Bakirov T.Y., Turgunbaev R.M. Improving the teaching of scientific concepts about the line in interdisciplinary communication in the process of preparing future mathematics teachers // Scientific Bulletin of Namangan State University. October 2019. – p. 278-287.

9. Ismoilov E.O. Tools aimed at developing students' professional competence on the basis of an integrative approach // European Journal of Humanities and Educational Advancements (EJHEA) (ISSN 2660-5589) (Journal impact factor 7.223). – Spain, volume 3, № 4, April 2022. – p. 34-42.