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DEVELOPMENT OF PROFESSIONAL-PEDAGOGICAL COMPETENCE IN FUTURE IT TEACHERS IN THE INTEGRATION OF HUMANITARIAN AND NATURAL-SCIENTIFIC, GENERAL PROFESSIONAL COURSES

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Abstract:

The article discusses the purpose of integration, vertical integration, horizontal integration, ways of developing the professional and pedagogical competence of future computer science teachers, the application of SIAM2P education with the transfer of STEAM principles to professional pedagogical activities, the advantages of SIAM2P education, as well as the humanities and natural sciences. A table is provided with course titles and related topics selected for the integrative approach.

Keywords: integration, goal of integration, vertical integration, horizontal integration, STEAM education, SIAM2P education, professional and pedagogical competence.

We demonstrate integrated teaching of humanitarian, natural-scientific, general professional courses during the teaching of the "Methodology of Informatics" course. The purpose of teaching the course "Informatics Teaching Methodology" is to prepare future teachers to teach informatics and information technologies, to use modern pedagogic and information technologies in their professional activities, to organize and conduct various forms of classroom and extracurricular activities in informatics, ways of informatization of the field of education and It consists of developing and deepening their ideas about their perspectives, forming and developing the knowledge, skills and qualifications for practical application that an informatics teacher should acquire in the professional field.

In order to achieve this goal, science students, as future informatics teachers, should be taught the importance of informatics and information technologies taught in general secondary schools, academic lyceums and professional education, its content, principles, as well as the tasks of forming theoretical knowledge, practical skills and qualifications related to the relationship of science with other disciplines. performs [3,5].

The computer science teaching methodology course is related to computer science, algorithms, mathematics, general pedagogy, and general psychology. Therefore, we will show the methodology of teaching laboratory training with the help of computer science teaching methodology, integration with computer science, algorithms, mathematics, general pedagogy, general psychology courses.

The purpose of integration - in the implementation of the principle of integration in the process of teaching the course of computer science teaching methodology, its purpose is not only to show the points of contact of educational courses, but also to give ideas about the unity of the environment through their organic connection.

The following types of integration in education are distinguished:

The essence of vertical integration is the integration of material on the same subject in different semesters at different levels of complexity.

Horizontal integration is the integration of educational materials for various humanitarian and natural-scientific, general-professional courses taught in parallel [2].

Methods of developing the professional and pedagogical competence of future informatics teachers We offer SIAM2P education, transferring the principles of STEAM education to professional and pedagogical activities.

SIAM2P education offered by us is also an alternative approach to traditional education. SIAM2P is an abbreviation that stands for S -(science) Informatics teaching methodology, I-Informatics, A-Algorithms, M-mathematics, 2P-Pedagogy and Psychology. They learn based on interdisciplinary connections and a practical approach. SIAM2P allows students to carry out project and research activities in higher education institutions and outside higher education institutions.

SIAM2P is a new educational technology that integrates several disciplines as a means of developing critical thinking, research skills and teamwork skills.

The SIAM2P curriculum is based on the idea of educating students using an interdisciplinary and practical approach. Instead of studying each of the six

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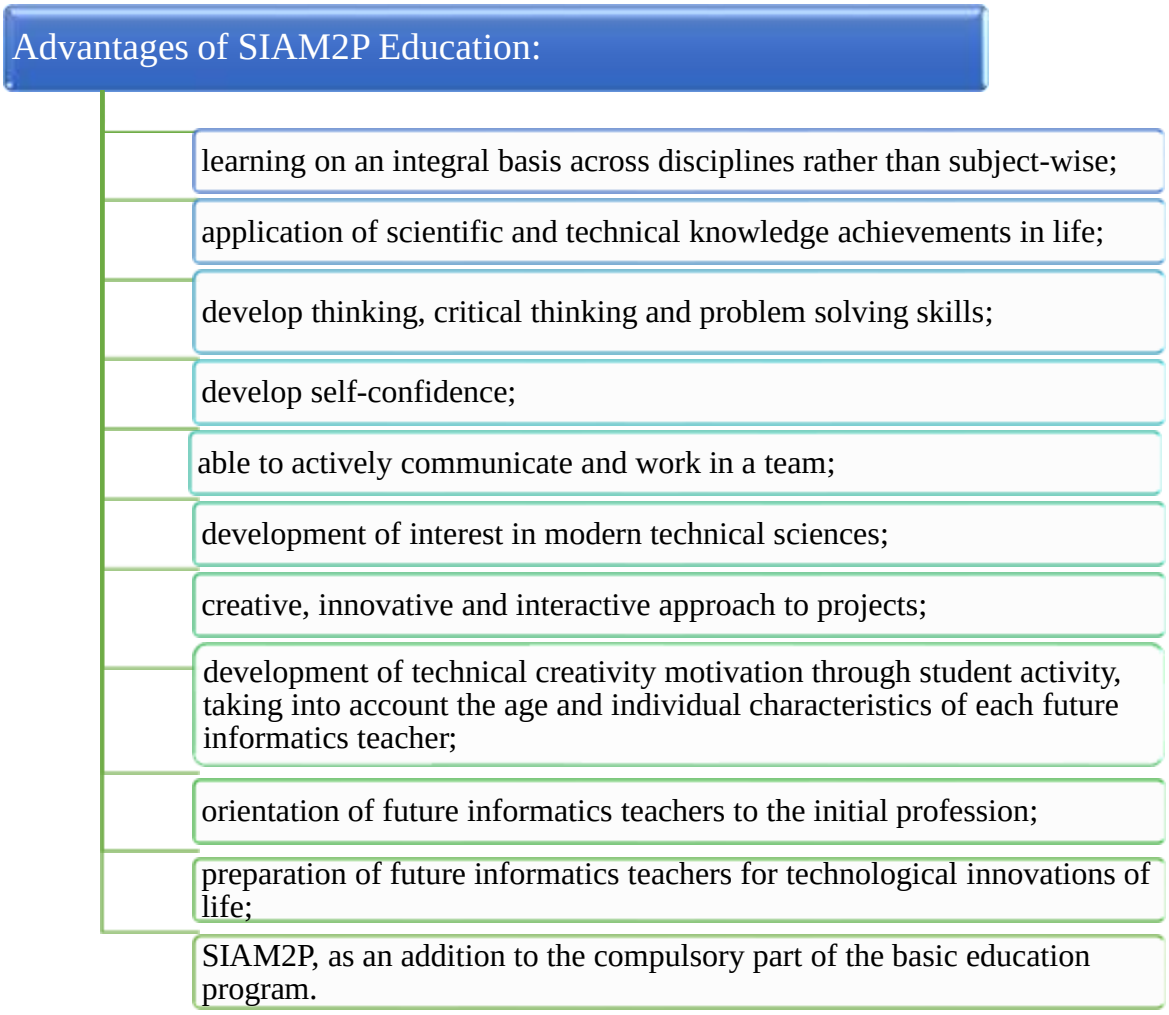
courses separately, SIAM2P integrates them into one educational pathway.

SIAM2P training allows the use of scientific methods, technical manuals, mathematical modeling. This leads to the development of professional and pedagogical competence of future informatics teachers. According to teachers, integration allows for success in most professions. Almost all researchers claim that advanced technologies increase the motivation to learn and expand basic knowledge in the field of algorithms and programming.

SIAM2P training is an innovative methodology that allows us to improve the skills of future informatics teachers and reach a new stage of professional-pedagogical competence development. With its help, we can form an advanced personnel base that will allow us to become an economically independent and competitive country



In the laboratory exercise in the "Planning of an hour lesson" course of the "Informatics teaching methodology" course (on the example of the topic "Programming of branching algorithms. if...else operator" of the 9th grade of general secondary schools "Informatics and information technologies" subject) horizontal and vertical SIAM2P method Table 1 selected topics for integration review[4].

Selected course titles and related topics for an integrative approach

Table 1

SIAM2P method	Course Names	Course topics

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S	Informatics teaching methodology	Plan a one-hour lesson
I	Informatics	Logical operations and logical elements
A	Алгоритмлар	Linear, branching and iterative programs
M	Mathematics	Concept of collection. The function and its delivery methods
P	General pedagogy	Educational content, Educational methods and tools, Educational organization and types, and STEAM education
P	General psychology	Intelligence and creativity

Although these training courses are located in different semesters in the curriculum of the 5110700-Informatics Teaching Methodology course, they are connected by the basic theoretical concepts and knowledge provided by the "Informatics Teaching Methodology" course. Now, with the teaching of the "Methodology of Informatics" course, the material of the same subject at different levels of complexity is taught in different semesters. Let's consider the horizontal integration of disciplines.

In order to ensure the horizontal and vertical integration of the SIAM2P method, the curriculum of the selected courses should be taught in different semesters. In our example, the "Informatics" training course is in the 1st-2nd semester, the "Algorithms" training course is in the 1st-2nd semester, the "Mathematics" training course is in the 1st-2nd semester, the "General Pedagogy" training course is in the 3rd-5th semester, and the "General "psychology" training course is taught in the 2.5 semester. Vertical integration of "Informatics", "Algorithms" and "Mathematics" courses and horizontal integration of "General Pedagogy" and "General Psychology" courses can be considered. The course "Methodology of teaching informatics" is taught on the basis of an integrative approach with the help of the courses listed above[6].

Selected "Programming of branching algorithms. We will form the content of the topic "if...else operator" based on an integrative approach.

In the laboratory exercise in the "Planning of an hour lesson" course of the "Informatics teaching methodology" course (on the example of the topic "Programming of branching algorithms. if...else operator" of the 9th grade of general secondary schools "Informatics and information technologies" subject) horizontal and vertical SIAM2P method Let's consider the integration

Informatics teaching methodology	**Informatics**	Algorithms	Algorithms	**Pedagogy**	**Psychology**
"Programming branching algorithms. lesson activity on the topic "if...else operator".	Logical: variables, expressions, operations (and, or, not) and elements	Branching algorithms and block diagram elements representing them graphically	Concept of collection. The function and its delivery methods	Educational content, methods, tools and forms and types of its organization. STEAM education.	Intelligence and creativity

1) In the course "Methodology of teaching informatics" there is a laboratory exercise in the lesson "Planning a one-hour lesson", and as part of our research, we will teach "Programming of network algorithms" in the subject "Informatics and information technologies" of the 9th grade of general secondary schools. "if...else operator" subject, transferring the principles of STEAM education to professional-pedagogical activity, improved lesson development based on SIAM2P education (Integration of Informatics, Algorithms, Mathematics, Pedagogy and Psychology).

2) 5110700 – Informatics course, which is included in the block of general professional subjects included in the curriculum of Informatics teaching methodology, in teaching the topic "Logical operations and logical elements", understanding of variables, expressions, operations (and, or, not) and elements is given. These concepts are used in branching algorithms using the if…else statement to link conditionals on variables.

3) In the "Algorithms" course, the subject of "Linear, branching and repetitive programs" is integrated with the concepts given about branching algorithmic

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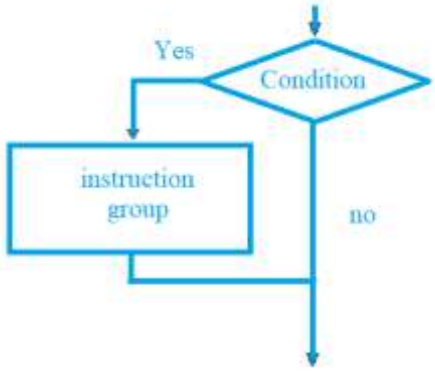
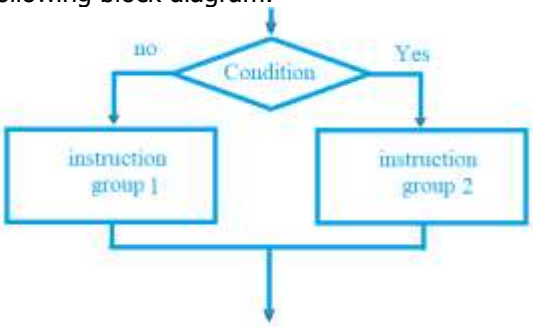
constructions and block diagram elements that represent them graphically.

These structures can be presented mainly in 2 types – full and reduced. They are represented by the following scheme:

1) The structure is expressed in abbreviated form "if .. then", by the words "if the condition then the end of the group" or by the following block diagram;



2) The structure is expressed in abbreviated form "if-then-else", by the words "if condition then group of instructions1 else end of group of instructions2" or by the following block diagram.



4) In the "Mathematics" course, "Set concept. When teaching the topic "function and its methods of presentation", information is given about the concept of sets, operations on them, the absolute value and properties of real numbers, the concept of functions and methods of presentation. The concept of a set is one of the basic concepts of a mathematics course and is not defined. To understand what the concept of a collection consists of, we refer to the following examples:

- if the given number a is greater than 5, calculate its square root;
- find the absolute value of the given integer;
- Find the root of a quadratic equation of the form ax2+bx+c=0.

The lesson plan is based on the knowledge and skills related to the above-mentioned topic and its concepts from the "Mathematics" course.

5) General pedagogy course on the topic "Educational content" on the main ideas on defining the content of education, normative documents defining the content of education, the State educational standard based on the competence approach, the principles of systematization of educational materials, STEAM education, "Educational methods and tools " on the subject of educational methods, methods, essence of educational methods, interactive educational methods and conditions for selecting educational methods, educational tools and their functions, interactive software tools, forms of educational organization and types of education, types of lessons on the topic "Forms and types of educational organization" and structure, non-standard lessons, auxiliary forms of educational organization, teacher's preparation for the lesson are given. Students build on their knowledge and skills of the above-mentioned topics and concepts acquired in the Pedagogy course when creating a lesson plan on the topic "Planning a One-Hour Lesson."

6) In the teaching of the subject "Intelligence and creativity" in the general psychology course, the concept of intelligence and creativity, the relationship between intelligence and creativity, the history of modern tests for measuring intelligence, the role of environment and heredity in the formation of intelligence, gender differences in the development of intelligence are given. In creating a lesson plan, students rely on the knowledge and skills of the above-mentioned topics and concepts acquired in the psychology course and are integrated with the above-mentioned concepts.

Based on an integrative approach, the development of professional and pedagogical competence of future informatics teachers is achieved by setting tasks appropriate to educational goals and implementing these tasks step by step, based on selected courses and mutually integrated concepts. Based on the analysis and summarization of materials related to the topic of research, the development of professional and pedagogical competence of future informatics teachers based on an integrative approach can be carried out by means of forms, methods and technologies that are part of pedagogical communication.

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