

An Interactive Approach to the Teaching of Competency-Based Modules in Vocational Education

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Abstract: The term integration was coined as a mathematical concept in the seventeenth century. In the XVIII-XIX centuries, this term crossed the boundaries of mathematics and gained the status of a universal general scientific category. For centuries, the concept of integration has been referred to with various terms such as unity, connection, synthesis in the context of education. The article considers the application of the principle of integrative training in vocational subjects. Integrative learning plays a key role in the development of students' logical thinking in the deep mastery of the topics learned in related subjects, in a comprehensive approach to the study of similar topics. Noting the advantages of integration, it is recommended to take this factor into account in the teaching of vocational subjects. The author demonstrates an example of integrative learning in one of the competency-based modules.

Keywords— vocational subject, integrative training, skills, learners, education.

1. INTRODUCTION

Integration in education is not a new issue. According to this approach, the student should be able to learn and apply the selected content in different areas through the subjects taught at school. It should be noted that the content of the vocational modules is highly integrative. Therefore, an unexpected understanding of the principle of interdisciplinary integration is impossible. When this principle is followed, interdisciplinary integration is needed at every stage of the subject.

The term integration was coined as a mathematical concept in the seventeenth century. In the XVIII-XIX centuries, this term crossed the boundaries of mathematics and gained the status of a universal general scientific category. For centuries, the concept of integration has been referred to with various terms such as unity, connection, synthesis in the context of education. The names "complex method", "interdisciplinary connection", "correlation" and, finally, "integration" are reflected in didactics. Attempts have been made to combine the concept of "integration" with the concept of "synthesis". However, some researchers believe that synthesis may be the final stage of the integration process, but the result cannot be. The problem of integration is reflected in the pedagogical views of famous pedagogues: YA Comenius, IF Herbart, KD Ushinsky and others. They saw the need for integration in the content of the training.

Integration into education is also a developmental feature for teachers. Integration, in addition to its function of increasing students' worldview and interest in the lesson, also forces

teachers to develop and work on themselves. Integration of knowledge requires the teacher to have some research skills. He/she should prepare seriously for the topic he/she will convey to the students in the next lesson. In our view, integration is not being aware of information from various sources on the subject, but thinking of more effective ways to apply, systematize and deliver the collected materials to students at the intended grade level. The teacher should adopt an individual approach in the integration phase as well as in the teaching process in general. This principle should be adjusted according to the student's level of knowledge.

Integrative learning plays an important role in the development of students' logical thinking in a comprehensive approach to the study of similar subjects, in mastering the subjects learned in related subjects in depth. Interdisciplinary relations and their integration also save time. This allows not only a comprehensive study of any field, but also the quality of mastery, feedback in the study of interdisciplinary issues, the management of the learning process, the creation of conditions for mutual understanding of teacher-student dialogue.

Given the importance of integration, the opportunities and ways to achieve it, it is important to keep in mind that creating a fully integrated textbook is difficult. In today's conditions, it is necessary to pay special attention to the following in order to avoid such difficulties.

1. For the implementation of integrative education, the programs (curriculum) should be significantly expanded and integrative content should be offered in the programs (curriculum).
2. Integrative textbooks should be created to achieve a consistent and consistent practice of integration.

3. In order to organize integrative education successfully, teachers who have the mentality to teach an integrative subject should be trained.

4. Many students are afraid to listen to integrative lectures only as spectators. They may grow up to know everything, but they cannot know everything exactly.

Providing intra- and inter-module integration in the teaching process, easier acquisition of knowledge and skills by students, interesting and meaningful organization of the lessons, are one of the important conditions for the formation of research tendencies in students. One of the points to be considered in the teaching of specialization subjects in vocational education is the integration between modules. Integration between modules is important in terms of understanding the subject, the connection of the students with the previous subjects and the general knowledge level of the students. Therefore, we can say that it is important for the quality of education to define and implement teaching strategies based on the principle of inter-module integration in vocational education without causing students to deviate from the concept.

2. INTEGRATION IN THE TEACHING OF COMPETENCY-BASED MODULES

Therefore, integrative teaching of subjects (modules) should be considered to improve the quality of teaching vocational modules. The establishment of integrative relationships in vocational modules and general education subjects leads to a comprehensive and in-depth study of the specialty subject. Integration in professional modules can take three forms: integration into core competencies, integration into general competencies and integration into specific competencies.

1. Integration into key competencies (Basic modules): These skills are taught in all areas of expertise in vocational education. These skills are regularly integrated into the teaching of vocational modules. The "Communication in a foreign language" module is mainly used in technical matters. This is because the technical terminology consists of international terms. Teachers (or masters of industrial training) should take this factor into account and bring special terms to the attention of students in the teaching of the module.

2. Integration into general competencies: The diversity of technical sciences has influenced the formation of specialties in vocational education. For example, Communication Equipment Installer-Communication Installer-Antenna, Electrician for Manual Repair of Electric Welding Equipment (Transformers) -Electrician for Repair and Service of Electrical Equipment, Electromechanic for Aircraft Device Equipment-Electromechanic for Aircraft Radio Equipment, etc. such specialties originated from the same branch. There are general competency-based modules that combine general concepts and knowledge of such specialties. When providing skills to students, it is possible to ensure the mastery of the conditions for the realization of skills and the small but equally important points that lie beneath it through the establishment of integrative training. A clear example of the integration of general competencies into specific competencies is the establishment of an integrative link in the "Medical Equipment

Maintenance" module developed on the basis of the "Support to the Implementation of the National Qualifications Framework in Azerbaijan" project. Accordingly, we can show the following connections:

- Establishing an integrative link between the first training output of the "Medical equipment maintenance" module and the third training output of the "Electrical and Electronics Fundamentals" module;
- To establish an integrative relationship between the results of the first training of the module "Maintenance of medical equipment" and the second and fifth evaluation criteria of the fifth training result of the module " Scheme, drawing and graphic works".

3. Integration into specific skills: The importance of this integration is that the student can relate the knowledge and skills acquired as a result of an education with the knowledge and skills acquired in previous learning outcomes. Integration into certain skills acts as a bridge so that some kind of professional knowledge is not lost, not erased from memory in a short time. For example, as a result of the " Medical equipment maintenance" training in the " Medical equipment maintenance" module, the previous criterion "Performs replacement work according to the relevant instructions" should be integrated into the "Replacing mechanical device parts" teaching. appropriate" evaluation criteria. In this case, trainees will be able to identify the removable joints according to the instructions, read the equipment manual again, and finally replace the mechanical parts that fail due to friction and wear.

One of the important points in the establishment of integrative education between modules is the delivery of integrative concepts to learners in connection with daily life. Thus, every detail used in the lesson, which is built on the principle of integrative learning, serves the formation of students' independent lives and self-management. Efforts should be made to use a variety of situations to convey the content of learning outcomes.

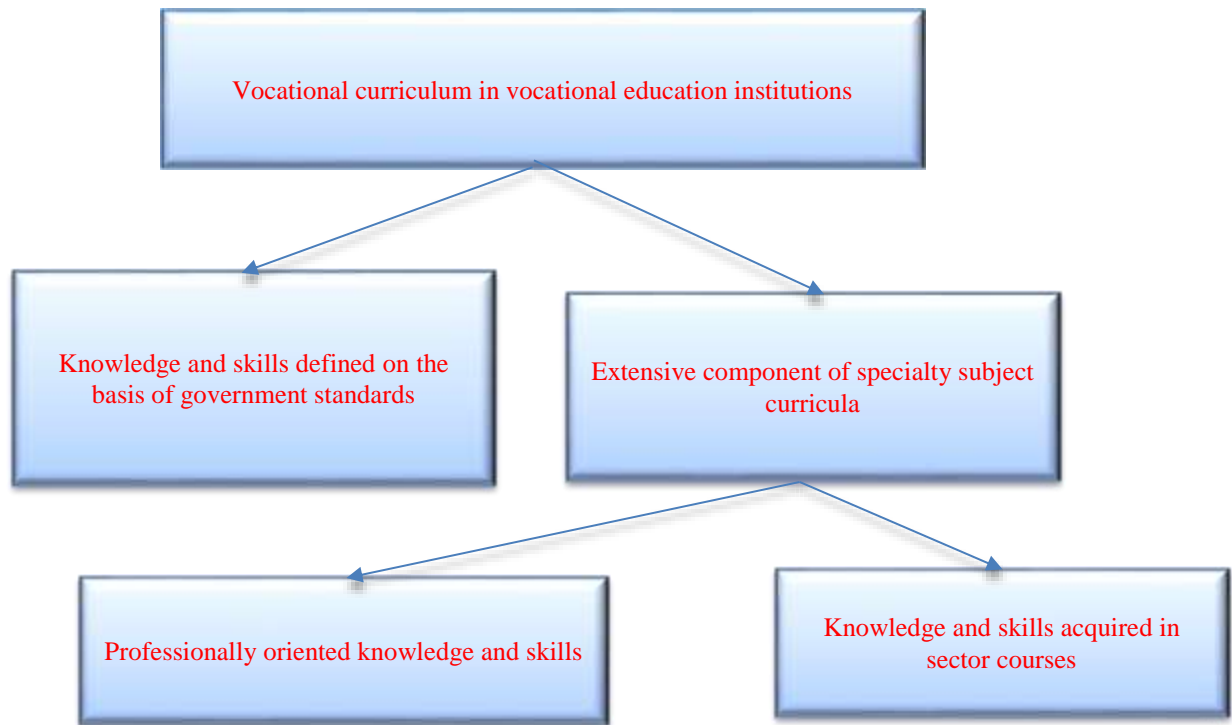


Figure 1. Interdisciplinary relations aimed at the future profession of students

In this case, the trainee will be aware of the situations he will encounter in the workplace and will be able to determine the most appropriate way of solving problems thanks to the knowledge and skills he has acquired as a result of the training. In the process of solving interdisciplinary problems and performing tasks, students feel real connections between events, become acquainted with technological processes based on the complex application of laws and events studied on different subjects. Unfortunately, there is no interdisciplinary link in the presentation of the content line of both general education and vocational modules in vocational education. In short, a systematic approach should be applied in the teaching of vocational modules.

According to experts, integration should be used not only in the teaching of the humanities, but also in the teaching of technical specialties, in order to master abstract concepts, complex formulas and expressions

3. CONCLUSION

Lesson example: Different training methods can be used to instill the competencies provided in the "Medical equipment maintenance" module. This includes observation, question-answer, group work, research, etc. are included. methods are valid. It is ensured that they have the necessary knowledge and skills on the subject by using the available opportunities.

"Medical equipment maintenance" module

I course	
Topic:	Instructions based on service manual
Standard:	1.1.2.
Aim:	<ol style="list-style-type: none"> 1. Analyzes equipment technical manual to find solutions to simple problems; 2. Follows the instructions given in the equipment manual for the organization of maintenance.; 3. Ability to read equipment technical manual for the preparation of periodic service schedules;
Integration:	<ol style="list-style-type: none"> 1. Module "Communication in a foreign language" 3.2.4. Explain the importance of technology. 2. Module "Electrics and Electronics Fundamentals" 3.4. Defines in the circuit the symbols of electronic lamps, diodes, triodes, tetrodes, pentodes, transistors and electron-beam and photoelectronic devices. 3. Module "Scheme, drawing and graphic works" 5.2. Explains mechanical and electrical working schemes. 5.5. Explains the essence of schemes.

Learning method:	Brainstorming, Auction, Carousel.
Learning Type:	Work in small groups, Individual work.
Learning equipment:	Modular materials, paper, marker, service manual, dictionary.
Course of learning:	The teacher uses the mental attack method to ask the students the following questions: <ol style="list-style-type: none">1. What parameters are shown in the equipment manual?2. What topics can be referred to in the technical indicators manual during maintenance?
	Assumptions are heard.
Research question:	<ul style="list-style-type: none">• What schemes are indicated in the technical manual, depending on the purpose of the equipment?
	The teacher divides the students into groups and assigns them tasks. Draws a concept map on the board (carousel method) and instructs to fill in the blocks.
Discussion:	<ul style="list-style-type: none">• Is it possible to prepare a maintenance schedule based on the service manual?• In which headings of the service manuals are the connection diagrams of the devices included?• What information is mentioned in the "Technical Data" heading?
Creative application:	<ul style="list-style-type: none">• Solve the following problems by providing groups with service manuals for different devices.• In the manual, find the device's network connection diagram and interpret the diagram.• Identify parts of the plan.• Determine which indicators are given in the "Product description".
Assessment:	This assessment is a factor that is taken into account at all stages of the course. In other words, the approaches and reactions of the learners to the subject should be taken into consideration in general, both in the discussion and in the application phase. The teacher addresses the following questions regarding the requirements to test both theoretical and practical knowledge to make the assessment (taking into account the knowledge gained at all stages). <ul style="list-style-type: none">• What is the essence of maintenance programs?• What are the 220V, 50 Hz values specified in the "Technical Data" section of the service manual for the ultrasound device?• What technical services can you provide using the "Error code" section of the Electrosurgery Service Manual?• What information is conveyed to the technician by the phrase "Output Frequencies - Output Frequency (all modes): 450 kHz \pm 50 kHz" in the electrosurgical devices service manual?.
Homework:	The block diagram of the EKG device service manual is printed and distributed to each student. They are required to read the block diagram. Draw the diagram of the electrical circuits of the device from the blocks that make up the circuit.

The article examines the possibilities of using integration in the teaching of vocational modules in order to coordinate knowledge and skills, systematize the irregular facts in the modules. The lesson example for the implementation of the content line in the module "Care of medical equipment" is designed taking into account the principle of integrative education. During the teaching of this module, it has been determined that the integration of the modules "Communication in a foreign language", "Electrical and Electronics Fundamentals" and "Scheme, drawing and graphic works" to the relevant content standards significantly increases the quality of education.

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