The European Proceedings of
Social & Behavioural Sciences
EpSBS

Future Academy

ISSN: 2357-1330

https://dx.doi.org/10.15405/epsbs.2019.03.02.271

SCTCMG 2018
International Scientific Conference «Social and Cultural Transformations in the Context of Modern Globalism»

PROBLEM OF UPDATING UNIVERSAL METHODOLOGY FOR INTEGRATION OF TEACHING UNITS (ITU)

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Abstract

The article presents the research on the problem of effective application of the methodology of integrated teaching units (ITU) of P.M. Erdniev, academician of Russian Academy of Science in vocational education. The methods and techniques of ITU were initially focused on the teaching of mathematics in primary and secondary schools. In this article they are considered in the aspect of training future specialists in the system of secondary vocational and higher education.

The authors show how ideas of the integration of teaching units (ITU), which became widespread in secondary schools, are actively used in the teaching of special disciplines in vocational education. The article provides examples of large-block presentation of educational material, both when studying humanitarian disciplines, and when studying general professional and special disciplines in higher education.

The authors emphasize that the integration of teaching units in vocational education acquires a special meaning, first of all, connected with the organization of training, when “a large portion of educational material is supplied to a unit of time”, and by enlarging actions, when concepts and subject tasks are generalized, related blocks of educational material are studied at the same time, interrelated actions, operations, and functions are given to students. As a result it is concluded that the ITU technique, being universal, is currently actively used in professional education and allows creating conditions for the effective training of future specialists.

The application of ITU allows conducting training in a shorter period, which is dictated by modern conditions of education system development.

Keywords: Methodology, methods, vocational, education, teaching units.

https://dx.doi.org/10.15405/epsbs.2019.03.02.271
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Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

Vocational education should be affordable, high-qualitative and effective. In order to solve these problems, modern vocational education requires highly qualified pedagogical personnel who meet the new requirements of society, are ready to improve traditional teaching methods and techniques, are capable of innovative changes in methods, are familiar with the research of methodologists of the past and have advanced pedagogical experience.

The teachers of secondary schools in search of the effectiveness of modern lessons turned to the methodology of integrated teaching units (ITE) of academician P. M. Erdniev. Today this methodology received general teaching status, which was especially intensively developed in the late 20th century. The methods and techniques of ITU were actively used in the practice of teaching mathematics, physics, and humanities in secondary schools. The various aspects of the problem of the separation and integration of units of knowledge are most fully examined in the methods of teaching mathematics in primary and secondary schools. The idea of ITU formed the basis of the concept created by academician P. Erdniev, the implementation of which means, in particular, an integrated approach to the content of educational material: it is necessary to consider complete groups of related (interrelated) units of this content together, in connections and transitions.

The theory of ITU is a system of large-block construction of program material. The core of it is as follows: the provision on the enlarged approach to the organization of the content of educational material, the relations and mutual transitions are considered; the blocks of complete groups of related units of this content are allocated. Academician P.M. Erdniev (Erdniev & Erdniev, 1986), describing the integrated teaching units, notes that “the concept of an integrated teaching unit ... incorporates interconnected specific approaches to learning, manifested in the joint and simultaneous study of interrelated actions, operations, functions, in ensuring the unity of the process of formation and solution of tasks of mutual transitions of certain and uncertain tasks” (Bogatyrev & Veit, 2006; Holjgonova, 2016). The learning experience based on the integration of teaching units showed that the main form of learning when applying the ITU technique should be presented by “a multi-component task consisting of several logically heterogeneous, but psychologically connected parts”. The acceptance of joint and simultaneous study of interrelated actions, operations, functions and theorems performs the main load on the integration of teaching material. Such techniques (Erdniev, 1979; Erdniev, Amulakova & Aitaeva, 2013) are a means of increasing knowledge. The concentration and compaction of the material contributes to the shortening of links between certain types of knowledge, thereby ensuring their consistency, reducing the workload of students and the expenditure of training time.

2. Problem Statement

The purpose of the research is to consider the problems of implementation of the integrated teaching units in the system of vocational education; to explore and summarize the experience of teaching general educational disciplines in the system of secondary vocational education and general professional and special disciplines in the system of higher education, based on the use of the ITU methodology (using the example of Kalmyk State University).

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3. Research Questions

The subject of research is the integrated teaching units, the principles of their justification, the methods and techniques for their use in vocational education system.

4. Purpose of the Study

The purpose of the research is to identify the problems of implementation of integrated teaching units in vocational education based on the methods of analysis, synthesis, methods of observation, comparison, generalization of practical experience in teaching general education, general professional and special disciplines. Referring to the modern publications on the problems of ITU, the authors of the research reveal that in recent years, in connection with the modernization of vocational education, the methods and techniques of integrated teaching units have been updated and adapted to the practice of teaching in higher and vocational education institutes.

The ITU methodology has been substantiated, and the effectiveness of the aggregative introduction of new knowledge has been proved (Mikerova, 1997; Dorofeev, 2013). Its application allows:

- applying generalizations in the current academic work at each lesson;
- establishing more logical links in the material;
- highlighting the main and the essential in a large dose of the material;
- understanding the role of the material in the general system of Knowledge-Abilities-Skills;
- revealing more interdisciplinary relationships;
- presenting the material more emotionally;
- making consolidation of the material more efficient.

5. Research Methods

The purpose of the study is to reveal the problems of realization of enlarged didactic units in vocational education based on the methods of analysis, synthesis, methods of observation, comparison, generalization of practical experience in teaching general education, general professional and special disciplines. Resorting to the modern publications on UDE problems, the authors of the book reveal the fact that in recent years due to modernization of vocational education, methods and techniques of enlarged didactic units have been updated and adapted to the practice of teaching at higher schools and secondary specialized educational institutions (SSEI).

6. Findings

The ITU technique, being interpreted in vocational education, acquires a special meaning. The integration of teaching units in vocational education is primarily related to the organization of training, when “a large portion of educational material is delivered to a unit of time” and the integration of actions, when concepts, subject tasks are generalized, related blocks of educational material come together, interrelated actions, operations and functions are studied simultaneously.

Such approach is aimed at achieving the integrity of knowledge as the main condition of development and self-development of students' intelligence. During learning, an informational more perfect sequence of sections and themes of school subjects is being created, providing their unity and integrity.

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At the same time, it is necessary to consider that the ITU concept is quite general; it can be presented as an integration of specific approaches to training:

1) to jointly and simultaneously study interrelated actions, operations, etc.;

2) to ensure the unity of processes of making up and solving tasks;

3) to consider certain and uncertain tasks in mutual transitions;

4) to transform the exercise structure, which creates conditions for opposing the original and transformed tasks;

5) to identify the complex nature of knowledge, to achieve a systematicity of knowledge;

6) to have a principle of complementarity in the system of exercises.

In this case, fundamental laws of thinking are used:

• the law of the unity and struggle of opposites;

• intermittent opposition of contrasting stimuli;

• a principle of feedback, systematicity and cyclicity of processes, reversibility of operations;

• transition to supercharacters, i.e. operating with longer sequences of characters.

ITU is a local system of concepts united based on their semantic logical connections and forming an integral unit of information.

Training in the practice of teaching of general education disciplines (Russian language, literature and history) and general professional disciplines (engineering graphics and basic economics) is based on the following scheme:

1) A stage of mastering of an undifferentiated whole in its first approximation.

2) Isolation of elements and their relationships on the whole.

3) Formation of a more perfect and accurate holistic image on the basis of the mastered elements and their interrelations.

When using this approach, students are offered to:

• study simultaneously mutually inverse actions and operations;

• compare opposite concepts, considering them simultaneously;

• compare related and similar concepts;

• compare stages of work with the exercise, ways of solving, for example.

The following rule serves as the main theme of a lesson, built according to the ITU system: not repetition, postponed to subsequent lessons, but transformation of the completed task, carried out immediately at this lesson, a few seconds or minutes after the initial one, to cognize the object in its development, to oppose the original form of knowledge to the altered one.

Teaching methods are realized by doing exercises and objectified in knowledge. At the same time, not only the quantitative variety of methods and exercises is important in itself. Only a set of specific exercises, designed on the basis of the principle of integration, in their clear sequence provides solidity and consciousness of knowledge acquisition.

The ITU technology uses simultaneously all the codes that carry information: a word, a picture, a symbol, a number, a model, a subject, and physical experience.

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Such approaches to the training of future specialists make it possible to successfully solve topical problems of vocational education in Russia (Lymar, 2018; Nudenova, 2018).

7. Conclusion

In vocational education, the study of general education disciplines (mathematics, physics, literature, the Russian language, etc.) takes up significantly less hours than in secondary schools. The contradiction that has arisen in vocational education between the complication and increase in the content and volume of academic disciplines and the limitation of time to study them, involves, first of all, the development of methods for accelerated and effective training of future specialists, taking into account modern psychological and pedagogical concepts, which include the method of the integration of teaching units.

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