



Теория и практика модульного обучения в российском образовании

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АННОТАЦИЯ

Введение. На протяжении последних шести десятилетий модульное обучение выступает важным дидактическим подходом в современном образовании, является одним из факторов его развития. *Цель статьи* заключается в характеристике этого важного научного явления, оказывающего существенное влияние на характер и качество общего и профессионального образования.

Методы. В процессе работы авторами использовались методы анализа теоретической и методической литературы по предмету исследования, изучения педагогической практики, а также системно-исторический подход к характеристике изучаемого педагогического явления.

Результаты. Модульное обучение появилось в европейской, а затем и в советской, дидактике во второй половине XX в. как своего рода ответ на потребность общества в поиске новых, более совершенных и сравнительно быстрых способов подготовки профессиональных кадров. В основе модульного обучения лежит разделение содержания изучаемого учебного материала на небольшие части, называемые модулями. Такой подход позволяет обучающимся изучать отдельные части контента в удобном для них темпе и в соответствии с собственным графиком. Модульный подход предполагает значительное изменение позиции педагога и обучаемых в направлении большей самостоятельности последних, развития у них ответственности и творческого начала. В значительно большей степени данный подход применим в профессиональных учебных заведениях, прежде всего высших, но в последние годы находит применение и в практике работы передовых педагогов общеобразовательных учреждений.

Заключение. Как показывают проведенные исследования, и доказывает педагогическая практика, модульная система общего и профессионального образования способна в значительной мере повысить эффективность и качество подготовки выпускников школ и специалистов, и в определенной степени выступать в качестве дидактического средства, обеспечивающего развитие творческой и деятельной личности. Разумеется, внедрение модульного обучения требует определенной организационной и методической перестройки учебного процесса, которая неизбежно затрагивает вопросы планирования работы преподавателей, подготовки необходимой лабораторной базы к фронтальному проведению проверочных и творческих работ обучаемых, формирования контингента студентов и учащихся с учетом пропускной способности лабораторий, разработки соответствующего методического обеспечения.

КЛЮЧЕВЫЕ СЛОВА

модульное обучение, модульный подход, структура модуля, Юцявичене, Чошанов, Гузеев, Ермоленко, Вазина

Для цитирования: Помелов В. Б., Грибанов И. Н., Тарлавский В. И. Теория и практика модульного обучения в российском образовании // Перспективы науки и образования. 2025. № 2. С. 560–572. <https://doi.org/10.32744/pse.2025.2.35>

Поступила: 21.10.2024 | Одобрена: 11.01.2025 | Опубликована: 30.04.2025



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Theory and practice of modular education in Russian education

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ABSTRACT

Introduction. Over the past six decades, modular education has been an important didactic approach in modern international and domestic education, and is one of the factors of its development. *The purpose of the article* is to characterize this important scientific phenomenon, which has a significant impact on the nature and quality of general and vocational education.

Methods. In the process of work, the authors used methods of analyzing theoretical and methodological literature on the subject of research, studying pedagogical practice, as well as a systematic historical approach to characterizing the studied pedagogical phenomenon.

Results. Modular education appeared in European, and then in Soviet, didactics in the second half of the XX century as a kind of response to the need of society to find new, more advanced and relatively fast ways to train professional personnel. The basis of modular learning is the division of the content of the studied educational material into small parts, called modules. This approach allows students to study individual parts of the content at a pace convenient for them and in accordance with their own schedule. The modular approach involves a significant change in the position of the teacher and the trainees in the direction of greater independence of the latter, the development of their responsibility and creativity. To a much greater extent, this approach is applicable in professional educational institutions, primarily higher ones, but in recent years it has also found application in the practice of advanced teachers of general education institutions.

Conclusion. As the conducted research shows, and pedagogical practice proves, the modular system of general and vocational education is able to significantly improve the efficiency and quality of training of school graduates and specialists, and to a certain extent act as a didactic tool that ensures the development of a creative and active personality. Of course, the introduction of modular training requires a certain organizational and methodological restructuring of the educational process, which inevitably affects the issues of planning the work of teachers, preparing the necessary laboratory base for the frontal conduct of testing and creative work of trainees, forming a contingent of students and students taking into account the capacity of laboratories, developing appropriate methodological support.

KEYWORDS

modular training, modular approach, modular structure, Yutsevichene, Choshanov, Guzeev, Ermolenko, Vasina

For Citation: Pomelov, V. B., Gribanov, I. N., & Tarlavsky, V. I. (2025). Theory and practice of modular education in Russian education. *Perspektivy nauki i obrazovaniya* = *Perspectives of Science and Education*, (2), 560–572. <https://doi.org/10.32744/pse.2025.2.35>

Received: 21 October 2024 | Approved: 11 January 2025 | Published: 30 April 2025



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INTRODUCTION

The analytical note by UN Chief Antonio Guterres (2023) indicates that throughout the history of mankind, education has been a "great equalizer", a driving force of state-building and social, cultural, economic and technological progress. However, today education doesn't meet its purpose effectively. Against the background of technology development, climate problems and increasing polarization of society, the very relevance of modern education systems is being questioned more than ever before, the UN Chief proposes to recognize education and lifelong learning as a global public good and to intensify international cooperation in order to invest in education and its transformation in the context of achieving the Sustainable Development Goals development [1].

In the "National Doctrine of Education of the Russian Federation for the period up to 2025", the individualization of the educational process, provided by a variety of educational programs, types and forms of student learning, is called the expected result of its implementation. At the same time, the teacher today becomes a designer of new pedagogical situations aimed at using generalized methods of activity and creating students' own products in the development of knowledge [2].

In Russian education, the importance of modular technology is recognized even at the legislative level. According to the Federal Law "On Education in the Russian Federation" dated December 29, 2012, when implementing educational programs by an organization engaged in educational activities, a form of organization of educational activities based on the modular principle of presenting the content of an educational program and building curricula, using appropriate educational technologies can be used [3].

These requirements are precisely met by the technology of modular learning, which allows each student to achieve higher results in educational activities, creates conditions conducive to self-development, forms the need to search for new knowledge, provides a high level of motivation for learning, a positive emotional background of learning and produces a situation of success [4, p. 35].

An important means of achieving the above-mentioned goal is the introduction of advanced teaching methods and approaches that meet modern socio-economic and scientific requirements [5]. In some cases, these innovations are, at first glance, paradoxical in nature, like the technology of the "inverted class" [6]. Moreover, such technologies are used primarily in vocational education, including in the training of engineers [7]. Even a whole direction in pedagogy has taken shape, which is called Flipped pedagogy [8]. At the same time, some scientists even come up with some kind of warnings that the unrestrained pursuit of novelty in practical pedagogy is fraught with unintended consequences [9].

At the same time, in search of the right answers to emerging problems, scientists consider it necessary to turn, among other things, to the positive legacy of advanced teachers of the past [10]. One of such important innovations is modular training [11].

Modular training originated after the Second World War in response to the increased need of society to train high-quality professional personnel in a relatively short period of time. In addition, this form of education fully corresponded to the ideology of leading foreign philosophical and pedagogical concepts [12]. Scientists and educational practitioners have studied in detail the characteristics of various types of production, and on this basis have developed numerous, detailed technological instructions, as well as safety instructions. This was already a kind of modular training, but this term hadn't yet been initially adapted to education and vocational training [13].

MATERIALS AND METHODS

In the research work, the authors used the following scientific and pedagogical methods of analyzing theoretical and methodological literature on the subject of research, studying pedagogical practice, as well as a systematic historical approach to characterizing the studied pedagogical phenomenon. The authors used publications by reputable authors, among them Dati Stefano, Polenghi Simonetta, Fisher Rosemary, Yutsevichene P. A., Calvani Antonio, Ermolenko V. A., Vazina K. Ya.,

Guzeev V. V., Choshanov M. A., etc., published in the journals *Ricerche di Pedagogia e Didattica*; *The Internet and Higher Education*; *XLinguae. European Scientific Language Journal*; *British Journal of Educational Technology*; *Active Learning in Higher Education*; *International Journal of Changes in Education*; *History of Education & Children's Literature*; *Medical Education today*; *Historical and Pedagogical Journal*; *Bulletin of Humanitarian Education*; *Pedagogy of Rural Schools*; *Pedagogical Art*; *Teacher*; *Pedagogy*; *Bulletin of Vyatka State University*, as well as in materials of scientific and practical conferences and in other publications.

RESULTS

In its original form, modular education originated in the late 1960s, as a result of many years of creative search by a number of English-speaking teachers who proposed a kind of improved version of the project method that existed since the beginning of the 20th century and the team-laboratory construction of the educational process [14]. Attempts, however unsuccessful, to develop the idea of American and Western European didactics in the field of project-based learning in general and vocational schools have been carried out in the USSR since the early 1920s [15]. It can even be argued that the introduction of these ideas into the practice of general education schools in the second half of the 1920s – early 1930s became the most important criterion for evaluating the activities of educational institutions [16]. Attempts to deviate from the instructions of the People's Commissariat of Education of the RSFSR in the issue of forms of organization of the educational process were severely suppressed [17].

An important incentive for the introduction of modular technology was the UNESCO conference held in Paris in 1974, which recommended "the creation of open and flexible educational and vocational training structures that allow adapting to the changing needs of production, science, as well as adapting to local conditions" [18]. These high requirements were best met by modular training, which made it possible to flexibly build content from blocks, integrate various types and forms of training, choose the most suitable ones for a certain audience of students, who, in turn, had the opportunity to independently work with the individual curriculum offered to them at a pace convenient for them. In Russian pedagogy, the foundations of modular education in Soviet times, namely since the second half of the 1980s, were studied and developed by such researchers as Palmira Albinovna Yutsevichene [19], Murat Ashirovich Choshanov [20], Vyacheslav Valeryanovich Guzeev [21], Valentina Andreevna Ermolenko [22], Kima Yakovlevna Vazina [23].

Let's highlight the most important ideas underlying modular learning in domestic education: V. V. Guzeev's scientific and methodological approach to the design of elements of the educational process (modules) that make up a block of lessons in modular block technology, to the design of modules, to planning the stages of developing a block of lessons, to the structure of a block of lessons [24]; theoretical and methodological fundamentals of M. A. Choshanov's block problem-modular technology [25], the fundamental principles of this technology, the design of block modules and block drawings, classification of teaching methods, criteria for their selection and combination; block-modular system for structuring the learning content, the design of blocks and modules in accordance with their qualifications, the structure of educational elements mastered during the educational process, developed by V. A. Ermolenko [26].

The interest of these researchers, their like-minded people and followers in modular learning was driven by the desire to achieve a number of goals. Some scientists considered the most important goal to allow the student to work at a convenient pace, to choose a method of learning suitable for a particular person; other teachers wanted, first of all, to help students identify their strengths and weaknesses, to give them the opportunity to engage in self-study using corrective modules. At the same time, there were attempts to integrate various methods and forms of education, flexibly build the content of education from the formed units of educational material, and, finally, to achieve a high level of readiness of students for professional activity.

Modular learning has inherited a number of characteristics from its "predecessors". Thus, the student could work almost independently, or even completely independently, with the individual

curriculum offered to him, which included the purpose and lesson plan, an information bank (content), methodological guidance (instructions). The functions of the teacher ranged from information and control to advisory and coordinating. Schoolchildren weren't able to master the educational material in this mode, so modular training was used, and then only partially and far from everywhere, exclusively in higher educational institutions of a number of foreign countries [27].

Over time, the very concept of "modular learning" turned out to be rethought, which began to be understood as such a structural structure of educational material, which provides for the consistent study of relatively completed, bearing a certain functional load, segments (doses of information) sufficient for further advancement of students along the path of mastering the discipline.

Thus, it became possible to formulate the very concept that is at the center of our attention. Modular learning is an approach to learning based on dividing the learning content into small parts called modules. This approach allows students and schoolchildren to study individual parts of the material at a convenient pace and according to their own schedule.

In engineering, a module is a node of a device capable of performing a certain working function, but not able to replace the device as a whole. In pedagogy, a module is a target functionally completed node that combines educational content and the technology of mastering it. The term "module" means a separable, relatively independent part of a system, organization, or structure.

In relation to education, modular technology is used in teaching, and acts as an approach according to which the teacher (teacher) organizationally and structurally builds the development of educational material, focusing on the use of completed didactic units.

Gradually, modular education became more and more actively used in general education institutions, as well as in the system of primary and secondary vocational education [28]. It began to be used as part of the development of modern educational technologies by teachers [29]. The central element of modular training is the training module, which is a logically completed form of part of the content of the discipline, and includes cognitive, and in some cases professional, aspects. (The professional aspect takes place, as a rule, in post-secondary education).

The assimilation of these aspects should be completed by an appropriate form of knowledge control of the skills and abilities formed as a result of mastering this module by the trainees.

Depending on which type of educational institution (general education or professional) modular training is used, the module can contain either only cognitive or cognitive and professional components (characteristics). The structure of the training module has the following form: the name of the module, its serial number; its content and structure; educational, methodological and software; implementation of the module content in the educational process (theoretical and practical classes, laboratory workshop), independent work of students, planned learning outcomes (knowledge, skills, competencies). The structural composition of the module can also be interpreted as follows: a target action plan, a bank of information, a methodological guide to achieving didactic goals.

The theory and practice of modular education in vocational schools is based on a number of specific principles closely related to general didactic principles. P. A. Yutsevichene identifies eight "modular" principles [30]. Let's consider them sequentially. In the first place in importance is the principle of modularity as such. It defines the approach to learning itself, which finds its specific reflection in the content, organizational forms and methods used. In accordance with this principle, training is based on separate functional units, modules. The implementation of this principle implies the need to comply with the following didactic requirement: the educational material is designed as a complete block, so that it's possible to "subordinate" individual modules to a single, complex didactic goal.

The principle of separating isolated elements from the teaching content requires considering the educational material within the module as a kind of unified integrity aimed at solving an integrated didactic goal. The smallest unit of learning content is considered to be a specific topic or a fragment of it that meets a specific (rather than complex) didactic purpose and is called a module element. The achievement of this specific (or private) didactic goal should be fully ensured by the content of the educational material of each element, and the totality of the content of individual (private) goals should make up one completed module.

The principle of dynamism is designed to ensure free change in content of modules caused by the desire to fill a module with new, better content and the exclusion of factual information from it, which hasn't justified itself in the practice of the teacher. The latter, as is known, almost always strives to create such graphically fixed, structurally designed plans for his work, which are just manifested in modules, technological maps, etc., in order not to engage in this rather tedious and tedious business every year. At the same time, various government standards, curricula and textbooks change so often – almost annually – that creators of modules have to revise their contents much more often than they would like to do, namely, in accordance with above-mentioned changes.

Thus, in the process of implementing the principle of dynamism, content of each module can easily change, being supplemented with new, more relevant material and getting rid of the content that hasn't justified itself. A module should be designed in such a way that its elements can be easily replaced.

The principle of effectiveness and efficiency of knowledge and its system. This principle has more to do with vocational education. By "system" here we mean a set of knowledge – as well as skills, abilities and competencies – that the student will be able to freely and independently apply in practice.

The implementation of the principle requires an interdisciplinary construction of the content of the modules, a problem-based approach to the assimilation of knowledge, and the discovery of the possibility of transferring knowledge from one type of activity to another. It is clear that this principle has a greater application in vocational training.

The principle of conscious perspective requires a deep understanding by students of the near, medium and distant perspectives of learning. Proponents of modular learning believe that each student should first present the entire modular program developed for a long period of study (course, year, the entire period of study). This program should accurately indicate a comprehensive didactic goal, which the student must understand and realize as a personally significant and expected result [31, p. 218]. Adherents of modular training give literally following instructions: "At the beginning of each module, it's necessary to specifically describe the integrated goals of the teaching as the results of activity. At the beginning of each element, the particular goals of the teaching should be precisely indicated as the results of activity" [31, p. 219].

A question involuntarily arises, why do this? And won't it turn out that a very significant part of the study time will be extremely unproductively spent on compliance with these, in our opinion, completely far-fetched requirements that can only complicate the perception of the essence of modular learning with artificially "added" maxims.

It seems to us that this principle, like the one discussed above, is more suitable for a professional school, and if it "fits", then with strong reservations. It's simply naive to demand this "awareness" from a school pupil. And most importantly, what exactly does modular training have to do with it? If we are to achieve awareness of certain "prospects" from the trainees, then we must do this in any training format.

One comes to the same conclusion when he gets acquainted with the proposed principle of the versatility of methodological counseling. It requires ensuring a free choice of methods and organizational forms of training, working according to their own, original methods. However, no one prevents a teacher from freely choosing methods and means of teaching in any organization of didactic process, and not only modular! The principle of flexibility requires construction of a modular program and, accordingly, modules in such a way that it's easily possible to adapt content of training and ways of its assimilation to individual needs of trainees. The implementation of this principle in practice is a considerable difficulty.

The difficulty is the very need for an initial diagnosis of each student's knowledge. Moreover, this diagnosis should be carried out in such a way that, based on its results, it's possible to build an individualized structure of a module, fill it with content that would correspond to capabilities of a particular student. It's also necessary to build an individual learning pace, control and self-control.

It turns out, – how many students, how many modules?! It's hardly possible to demand from a university teacher, and even more so a school teacher, such dedication, patience and painstaking work. And from the student too!

Finally, the principle of parity. Proponents of modular learning believe that in traditional teaching, the main purpose of meetings between the teacher and the student is supposedly only "providing information", there is, so to speak, an "information injection". Hence, the conclusion is that the pedagogical process will become effective only if the student himself is as active as possible, and the teacher implements, first of all, an advisory and coordinating function based on an individual approach. This requires providing students with effective teaching tools, such as a module. Using this information tool, the student will be able to independently organize the assimilation of new material and come to each meeting with a teacher prepared for it.

According to supporters of the modular approach, this function is designed to free a teacher from performing a purely informational function and create conditions for a more vivid manifestation of a consultative and coordinating function.

Any material and spiritual entity is a set of its constituent elements. In order to make it easier to know this essence, the researcher, using the methods of concretization and abstraction, identifies its component parts and studies them separately. If these components turn out to be too large, they also undergo mental fragmentation into component parts. This is done in order to study them more conveniently and efficiently. This is, in particular, the purpose of developing modules, namely, to divide the content of the course or each topic of the course into components in accordance with professional, pedagogical and didactic tasks. At the same time, appropriate types and forms of training are determined for all components, their coordination over time and integration into a single complex called the learning process are carried out.

From the point of view of the trainees, the module is an integration of various types and forms of education subordinated to the general topic of the training course or an actual scientific and technical problem. The boundaries of the module are determined by the set of theoretical knowledge and skills established during its development, as well as practical actions necessary for future specialists to formulate and solve scientific, technical, or other professional tasks of this class. A regular semester course at a university, usually consisting of 40-50 lecture hours, is divided into several modules, similar to the accepted division of the course into a number of topics.

In many foreign universities, modular division is based on a strict systematic analysis of the conceptual apparatus of the discipline, which makes it possible to identify groups of fundamental concepts, logically and compactly group the material, avoid repetitions within the course and in related disciplines, and reduce the course volume by more than 30%.

A module is an independent structural unit and in some cases a student may not attend the entire course, but only a number of modules. Each module is provided with the necessary didactic and methodological materials, a list of basic concepts, skills and abilities that must be learned during training. Such a list, or a characteristic of the entrance, serves as the basis for drawing up a preliminary control program, which is most often performed in the form of written work or a computer test. As a result of such control, although the student does not receive a mark, he has a good opportunity to find out the level of his knowledge, and get recommendations for additional study of certain questions, the answers to which pose a certain difficulty for him. Within one course, the final control work at the end of each module serves as a kind of form of preliminary control for the next module.

For each module, a teacher generates a set of reference and illustrative materials, which a student receives before starting to study this module. A module is also provided with a list of recommended literature. Each student moves from one module to another as they master material and goes through stages of current control in some cases independently of their comrades. It's clear that this requires significant, additional efforts and time on the part of a teacher.

The information included in a module can have the widest range of complexity and depth, with a fairly clear structure and unified integrity, and at the same time be aimed at achieving an integrated

pedagogical goal. Since tasks of teaching can change over time, i.e. from one academic year to another, and educational material is periodically reviewed and updated in connection with the continuous development of science and technology, public life, socio-political, economic, cultural and literary processes that affect the content of education, the module structure includes a constant, basic, immutable component, as well as a changeable, variable part.

The basic component is a fundamental concept of an academic discipline, such as phenomena, law, structural plan, etc., or a group of interrelated concepts. The variability depends both on the change and updating of the content of the information, and on the direction of the student's specialization. Thus, the principle of flexibility and dynamism of education is implemented in practice without reducing the quality of training. To develop the entire set of modules, a systematic analysis and in-depth methodological study of the content and structure of the discipline are necessary, which would ensure the required qualification characteristics of the volume of knowledge, skills, abilities and competencies of students.

To assess knowledge in modular training, a rating, i.e. quantitative, knowledge assessment system is used. The initial rating is designed to assess students' knowledge at the beginning of the cycle, i.e. to check the residual level of knowledge and skills. He sets the student up for work from the first lessons. The technical rating consists of the current marks. The theoretical rating is "recruited" at seminars, and the creative rating is used to evaluate creative works. Monitoring plays an important role in the assessment of educational activities, which is a rating display of the dynamics of the quality of education.

As it's shown by theoretical research and practice of using technologies of design and modular training, as well as modular construction of the training course, this restructuring provides a number of significant advantages and is one of the effective ways to intensify the educational process [32].

The advantages of the modular approach include: ensuring methodically sound coordination of all types of educational process within each module and between them; a systematic approach to the construction of the course and the definition of its content; flexibility of the modular structure of the course; effective control over the assimilation of knowledge by students; identification of promising areas of scientific and methodological work of the teacher; rapid differentiation of students.

The modular formation of the course makes it possible to redistribute the time allocated by the curriculum for its study, expands the share of practical and laboratory classes, as well as independent work of students. With a comprehensive review of the content of the training modules, duplication in the study of the subject is eliminated, it becomes possible to reasonably introduce elements of scientific research and conduct research laboratory work into the educational process. The interrelation of various forms of education in the modular organization of the educational process allows you to purposefully manage the scientific and methodological work of the teacher.

The introduction of the new system, according to supporters of the modular organization of education, will automatically cancel the traditional test weeks and inter-semester exams, since the student will work on an individual schedule, and he will have the opportunity to integrate information on a fundamentally new system, which will combine basic, special, professional knowledge and skills.

The modular structure is due to the increased motivation of learning, since the student is interested in obtaining information, attending lectures and laboratory practical classes. The assessment of knowledge is usually rated according to an individual index. As a result of such an assessment of knowledge, students' interest in learning increases, it becomes possible to accelerate the study of the discipline, which will immediately give the learning process an individual character. Proponents of modular learning believe that the introduction of this technology will negate the stressful situations inherent in the examination system, and the knowledge control process will turn into interesting conversations and discussions on pressing problems of science. It sounds tempting, but the question arises, is it necessary to replace the complex and largely contradictory process of mastering knowledge with "interesting conversations and discussions on pressing issues"?! Doubts undoubtedly arise, and only the practice of applying a modular approach can resolve them.

In the last decade, the modular learning system has been tested in a number of secondary schools [33]. Rating control of students' knowledge is becoming the norm. As a rule, modular technology is introduced by teachers into the educational process gradually. Initially, it is combined

with the technology of explanatory and illustrative learning. In modular training, the maximum amount of time is devoted to independent learning, as well as special attention is paid to self-control and self-esteem [34].

Modular learning involves rigid structuring of educational information and learning content, as well as changing the organization of students' work – now they are dealing with complete, logically completed learning blocks (modules). The module necessarily coincides with the topic of the academic subject.

At the same time, in the module, the material being mastered and the degree of its development, as well as the organizational component of the lesson, are measured and evaluated; these are the assignment, work, attendance, starting, intermediate and final levels of students' knowledge.

The module clearly defines the purpose and objectives of studying the module, the levels of its development, and lists skills and abilities. A teacher who aspires to work in accordance with modular technology must program in advance not only the sequence of studying the educational material and the level of its assimilation; it is also important to provide for quality control of mastering knowledge and skills. The teacher always knows a list of basic concepts, skills and abilities for each specific module, including a quantitative measure of assessing the quality of learning. Based on this list, he compiles questions and training tasks covering all types of work on the module, and puts them under control in the final part of the work on studying the content of the module. As a rule, test tasks are used as a form of control.

Usually, teachers of history, biology and some other academic subjects begin to use modular learning technology starting from grades 6-7, but this technology is especially widely used in high school, since high school students already have fairly well-developed skills for self-study of the material. When developing a modular lesson, it should be borne in mind that each module has its own integrating didactic purpose.

The modules include fairly large blocks of educational content. Therefore, each integrating didactic goal is divided into private didactic goals, on the basis of which educational elements are distinguished.

At the beginning of the study of each module, the entrance control of students' knowledge and skills is carried out in order to have information about the level of students' readiness for work. Here the teacher can offer students such forms of work as biological (historical, geographical, mathematical, chemical, literary, etc.) dictation, test tasks, filling out tables, working with terms, with diagrams and drawings, writing a description of a plant and an animal (historical event, literary character, etc.), i.e. all that this helps the teacher to get an idea of the level of knowledge of the students.

Then students begin to study new material. At the end of each training element, the current and intermediate control is necessarily carried out. After completion of work with the module, an exit control is carried out, which makes it possible to determine the level of assimilation of the content of the entire module by students. They "earn" points for completing each task of the module.

Usually, over the years of using modular technologies, a teacher develops a high-quality cycle of lessons that changes annually in terms of improvement in all sections of his academic subject, and in some cases even creates a methodical collection with modular lessons.

In general, well-known methods can be used in "modular lessons": partially-search; research and verbal-logical. The forms of work include: working with a book (textbook), with concepts and terms (lexical meaning, unified spelling mode); working with text and popular science literature, with reference material; using drawings, tests, tables, graphs, diagrams; solving computational problems, etc.

Participant of the All-Russian competition of pedagogical skills "Innovative technologies of teaching school subjects" S. A. Blazhenko uses various forms of work in the classroom using modular technology at various stages of the lesson. The 1st stage of the lesson can be a short discussion on a given topic, which contributes to the development of logical thinking, as well as forms the ability to ask and answer questions. Its substantive basis of the dispute is a polemic on the essence of the content of the lesson.

During the 2nd stage of the lesson, the teacher presents new material in the form of a lecture, and students take notes, write out the main thoughts, draw up diagrams, etc. This work helps to develop independence and the ability to choose the right information. The 3rd stage of the lesson is a lecture with feedback, i.e. the teacher already asks a number of questions on the topic, and the answers of the students, which they give with the help of their notes, make it possible to understand how the material has been learned [35].

The teacher uses the following algorithm for compiling a modular lesson: determining the place of a modular lesson in the topic, formulating the topic of the lesson, determining and formulating the purpose of the lesson and the final learning outcomes, selecting the necessary factual material, selecting methods and forms of teaching and control, determining the methods of student learning, breaking down the educational content into separate logically completed learning elements and determining the goal each of them.

In our opinion, the advantages of modular training are as follows: high efficiency; formation of competencies based on personal qualities; individualization of learning; differentiated approach to learning; adaptation of educational material to didactic conditions; uniform distribution of educational load; assessment of knowledge according to the work performed (which is clearly expressed in the number of points for educational activities and reduces the likelihood of subjectivity teacher); the possibility of distance learning.

Meanwhile, researchers see disadvantages in modular training, namely: an excessively high level of independent work; the likelihood of didactically incorrect layout of educational material in modules; a strict limitation in the time allotted for completing tasks, which is often not enough in relation to the required amount of work performed; the need for large amounts of time to develop modular lessons; material the cost of photocopying the texts of modular lessons; initially, the students' readiness for independent work is not high enough.

Despite some disadvantages, the modular learning system is an innovative pedagogical technology that increases the effectiveness of the educational process, makes it more individualized and dynamic.

The results of using modular technology are as follows: the amount of work in the lesson increases, self-control and self-assessment skills appear, the organization of educational work improves, the accumulation of grades increases, the motivation for studying the subject increases, the quality of knowledge and the level of the educational process as a whole increases. The use of modular technology fundamentally changes the teacher's work. In the classroom, he motivates, organizes, coordinates and advises, i.e. carries out reflexive learning management, thus using the potential of modular learning.

The analysis of numerous observations and monitoring studies allows us to conclude that in classes at universities and school lessons conducted in accordance with modular technology, a conscious level of discipline is created, which positively affects the quality and effectiveness of the lesson, and independent work becomes a means of active cognitive activity for students. They are given the opportunity to receive individual advice, and self-monitoring, intermediate and exit control allows them to identify gaps in the assimilation of the topic.

DISCUSSION

The criteria for the success of the implementation of modular technology can be considered the following educational effects: flexibility (modular training provides students with the opportunity to study materials at their own pace and rhythm), personalization (each student can choose modules according to their interests and needs), support (modular training may include teaching support and/or various materials for self-study, which helps students to get additional help and resources if necessary), relevance (knowledge and skills acquired in one module can be used almost immediately, which contributes to the practical application of new knowledge). Recently, Russian scientists have been spreading the possibilities and prospects of using a modular approach to work with preschool

children [36]. There are undoubtedly prospects for using a modular approach in working with educational robotics [37].

Modular education can become an element of the formation of a psychologically comfortable educational environment in a rural school [38]. Some researchers link modular learning with such innovations as pedagogical design and pedagogical design [39; 40]. An indicator of the importance of the modular approach in teaching is the publications of recent years by foreign authors [41; 42; 43].

CONCLUSION

Thus, the modular system of general and vocational education and the intensification of information and activity learning process associated with its introduction, the knowledge control system and even the identification of professional suitability in some cases can significantly increase the effectiveness and quality of training of school graduates and specialists, ultimately, contribute to the development of a creative and active personality.

Of course, the introduction of modular training requires a certain organizational restructuring of the educational process, which affects the planning of teachers' work, the preparation of the necessary laboratory base for the frontal conduct of testing and creative work of trainees, the formation of a contingent of students and students taking into account the capacity of laboratories, the development of appropriate methodological support.

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Авторы заявляют об отсутствии конфликта интересов		The author's declared no conflicts of interest	