

Credit - A Module System and Its Principles of Implementation (In Teaching Mathematics in Higher Education Institutions)

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Abstract: *This article analyzes the theories of application of credit-module system in higher education institutions of Uzbekistan, teaching mathematics and their importance, in which the content and essence of the credit-module system, priorities, and The work done in the transfer of the system to this system, as well as the author's recommendations and opinions in this regard are presented on a scientific basis.*

Keywords: Credit-module system, module, modular teaching technology, credit, credit teaching technology, credit-modular system in teaching mathematics.

INTRODUCTION

The proposed article focuses on the introduction of a credit-module system in the teaching practice of higher education in Uzbekistan, based on the experiments of developed countries, and the introduction of this system in the teaching of mathematics. First of all, we need to clarify the concepts to be discussed. After all, the English philosopher Francis Bacon, who lived in the Middle Ages, said that the key to resolving strong conflicts is to logically analyze each terminology in the problem. Being able to fully explain them to others will solve the problem in advance.

In the context of the coronavirus pandemic, unprecedented changes are taking place in all aspects of human life. These series have also led to the "cracking" of long-established values, traditions and principles. In particular, the forecasts of leading scientists and experts of international organizations on the threats to the development of the Kurrai land in the near and medium term have not been confirmed. On the contrary, they are being reconsidered. But one thing is clear: as long as the world does not act as a whole, it is inevitable that man will fall victim to a very dangerous situation. The only way to salvation is to direct the accumulated knowledge, skills and conclusions to a common goal, to be able to effectively combine science and experience.

The formation of knowledge and science is directly related to the education system. The effectiveness of the education system is directly ensured by the level of teachers, student needs, the content of textbooks, and the infrastructure for the formation of independent learning. Thus, the training of advanced personnel, increasing their competitiveness in accordance with the requirements of the labor market, the training of creative professionals are closely linked with the educational process in educational institutions.

On October 8, 2019, the President signed the Decree "On approval of the Concept of development of the higher education system of the Republic of Uzbekistan until 2030." This important policy document states that "at least 10 higher education institutions in the country should be included in the list of the top 1,000 higher education institutions in the ranking of internationally recognized organizations (Quacquarelli Symonds World University Rankings, Times Nigher Education or Academic Ranking of World Universities) and study in higher education institutions. gradual transition of the process to a credit-module system".

In addition, by 2030, 85% of all higher education institutions (HEIs) in the country, including 33 higher education institutions in the 2020/2021 academic year, will be transferred to the credit-module system.

The credit-module system is a process of organizing education, a model of assessment based on a set of modular technologies of teaching and credit measurement. Carrying it out as a whole is a multifaceted and complex systemic process. The credit-module principle focuses on two main issues: ensuring the independent work of students; assessment of students' knowledge on the basis of rating.

The main tasks of the credit-module system are:

- modular organization of educational processes;
- Determining the cost of one subject, course (credit);
- Assessment of students' knowledge on the basis of rating points;
- allowing students to create their own curricula individually;
- increase the share of independent learning in the educational process;
- The convenience of educational programs and the possibility of changing them depending on the demand

for specialists in the labor market.

The purpose of the course is not only to teach on the basis of innovative educational technologies, but also to teach students to study independently, to take a new approach to education, to acquire the necessary and in-depth theoretical knowledge and practical skills based on labor market demand. In short, the system is focused on the professional development and maturity of the student. It is aimed at ensuring the lifelong learning of the scientist and the formation of human capital that can meet the labor market and modern requirements.

The credit-module system is a system aimed at independent learning and the creative acquisition of knowledge on an individual basis, the choice of the educational path with a firm definition of the educational process and the determination of the amount of knowledge in the form of credit. This system is now common in the education system of developed countries, has proven itself in time-tested and is different from each other, but complementary - modular and credit teaching technologies. formed by merging.

METHODS

A module is a separate course (or part of a course) that includes relevant knowledge and professional information. The modular system of teaching ends with the appropriate type of control of knowledge, skills and competencies that is formed as a result of the student's study of the science program. For example, current, intermediate, and final examinations are conducted to ensure that students' levels of knowledge and mastery are in line with state educational standards.

Modular learning is systematic learning. In this case, the educational material can be taught in the volume of a single lesson, at the level of any subject or section of the subject, and sometimes in a large component of the subject, ie in the form of blocks said Ikhtiyor Juraev, head of the teaching department at Tashkent State Law University. - The modules, first of all, effectively serve to explain the concepts, rules, theories, laws and laws that represent the general relationship between them, related to the content of education. In modular education, the teacher organizes, manages, advises and checks the process of mastering the listener. The student, on the other hand, focuses on independent learning towards the target object [2].

The academic credit system is a standardized assessment system that determines a student's ability to study effectively in higher education. Credit - consists of the time (hours) spent by the student to complete the relevant academic work. Each module has an independent credit account. The institution of higher education independently determines the credit structure, the number of credits for each module, as well as the total number of credits that must be collected by the student to complete each course and the entire period of study. Another distinctive feature of the academic credit system is the compliance of universal education programs with international general education standards and the problems of adopting educational documents, taking into account global trends. Students will have free access to university education in foreign countries, and bachelor's and master's degree graduates will have the right to work in any country.

A module is a part of a curriculum that covers several subjects and courses. It is a set of several courses aimed at developing students' knowledge and skills, analytical and logical observation. In doing so, the teacher organizes the learning process, gives live, video and audio lectures, coordinates and monitors the student's activities. The student will study the topic independently and complete the assignments.

According to foreign experience, the educational process in the credit-module system consists of 2-4 modules per semester. The disciplines covered in the module are easily developed from complex theoretical to practical sciences, and logically complementary. In order to become a professional, a student needs to have not only information, but also the ability to process it and put it into practice.

Module-based curricula are developed on a case-by-case basis and include:

- full disclosure of learning objectives and tasks;
- Requirements for the qualifications of the student to be acquired at the beginning and end of the subject (course);
- A summary (syllabus) of each subject included in the module, ie topics of lectures, plans of seminars and practical classes, assignments for the assessment of independent learning;
- Summary of teaching: methods and tools of teaching; methods and forms of knowledge assessment.

The module-based education system uses a rating system to assess students' knowledge, skills and abilities. It assesses all of a student's learning activities, including in-class and out-of-classroom learning.

Each student must collect credits in order to receive a diploma in their chosen field and specialty in the future. Accumulated credit will help the student to improve his / her skills or get a higher education throughout his / her life. In economic terms, the accumulated credit becomes the student's academic "asset."

Credit technology gives learners the right to choose the elective subjects included in the working curriculum, thereby directly participating in the development of the individual curriculum. They are given the

freedom to choose not only subjects but also professors. Giving students the opportunity to choose subjects is a positive thing. It is also an indicator of the value of learning.

History and reason.

Credit was first introduced in US universities in the 18th and 19th centuries to liberalize the learning process and to determine the student's weekly academic workload.

In 1869, Charles William Eliot, president of Harvard University and a prominent figure in American education, introduced the concept of "credit hour." Thus, between 1870 and 1880, a system of credit hours was introduced. The credit system and the mastery of the curriculum allowed students to independently plan the learning process, control its quality, and improve educational technologies.

The introduction of the credit accrual measure not only gave the student greater freedom, but also allowed him to independently plan the academic process so that he could become a competitive professional in his chosen field in the future. At the same time, it has led to improvements in the assessment system and educational technology.

As stated in the Bologna Declaration, the credit-module system serves two main functions, focusing on independent learning:

the first is to ensure the mobility of students and teachers, ie the free movement (transfer of study or work) from one higher education institution to another without hindrance;

second, the academic load - the credit - is clearly calculated for all the academic and research activities of the student in the chosen field of study or specialty. The sum of the credits shows how much the student has earned according to the chosen program.

Bologna Declaration: Prescription.

Today, we hear from those involved in the education system a variety of opinions about the Bologna system and its importance.

So what kind of system is this? What are its advantages and disadvantages?

We will continue our thoughts as a logical continuation of the theme.

To create this system, the integration of all higher education institutions in Europe since the 1970s, the creation of a single standard of higher education, the mobility of students and teachers, the recognition of diplomas, and the unification of scores for students' knowledge, skills and abilities have been addressed. efforts will be made.

As a result of these efforts, the Bologna Declaration was signed in 1999 in Bologna, Italy by representatives of 29 countries.

To date, 48 countries are participating in the Bologna process. Among the CIS countries are Russia, Ukraine, Azerbaijan, Moldova, Armenia, Georgia, Kazakhstan and Belarus.

The training of highly qualified personnel under the Bologna system is carried out in two stages. Usually a bachelor's degree of at least three years and a master's degree of 1-2 years.

Many experts oppose the Bologna Declaration's ability to attract talented students, the competition with the United States to value their knowledge in the labor market, the limited capacity of European higher education institutions, and the tendency of many "intellectuals" to leave the continent and emigrate to the United States. admits that it is the cause.

DISCUSSION

Why European education is a priority?

Today, there are four common models for implementing this credit rating system.

These are the United States Credit System (USCS); European credit system (ECTS); Asia-Pacific Credit System (UCTS); UK Credit System (CATS).

The most common of these models are the US and European models.

According to the information, the Ministry of Higher and Secondary Special Education of the country prioritizes the use of the European ECTS system in the introduction of the credit system. Therefore, we consider it appropriate to dwell on its advantages, advantages, advantages and disadvantages.

One of the most important aspects of the Bologna Declaration is the use of a single "credit system" (ECTS) by higher education institutions. A credit or unit of credit is an indicator of the value of any learning activity included in the curriculum.

The ECTS system offers great benefits to students in Europe and the Bologna Process in general.

For example, it guarantees that the academic knowledge acquired at the university where the student is studying will be recognized in the higher education institutions of the member countries of the system. At the same time, the system allows members to resume, transfer and terminate their studies at another university.

The ECTS system also offers a number of benefits to universities. In particular, it ensures the similarity and uniformity of curricula that accurately reflect information about the learning process in a particular field of study and specialization. It also allows the content of the higher education program to be agreed upon in advance in order to achieve recognition of the degree. The student retains responsibility and independence in resolving all issues related to education. In the European education system, courses and the entire educational process are calculated on credits, and in Uzbekistan and other CIS countries on academic hours.

Under the ECTS system, each institution of higher education independently determines the composition of credits, the number of credits for each module, as well as the total amount of credits that a student must collect to complete each course and the period of study in general.

In contrast to the current curriculum, in addition to the compulsory subjects in the credit system, elective subjects are also included in the student's individual course schedule. Students will not be expelled or dropped from course to course. If he / she is not able to collect credits from any subject (course), he / she will only have to retake the exam in that subject. Higher education diplomas are awarded upon completion of the required credits.

According to the ECTS system, the amount of credit that students have to accumulate in a year is 60. Assuming that one academic year consists of two semesters, a student must earn 30 credits per semester. If the bachelor's program is 3-4 years, the student is required to collect a total of 180-240 credits to obtain a bachelor's degree, and 60-120 credits to complete a 1-2-year master's program.

What was the situation in Uzbekistan like?

As you know, we have limited access to information sources and various international databases. As a result, in higher education, professors have focused on finding information, assimilating it, and disseminating it to students after initial processing. That is, teachers were merely the subject of receiving and transmitting information.

In this case, the student acts as a receiver of information as an object of the educational process, spending most of his time listening to lectures in the classroom. Today, the development of independent student education is on the agenda due to the acceleration of access to information, the expansion of access to international scientific and technical databases, and the acceleration of globalization.

Curricula of specialties and specialties were supplemented by subjects not related to the labor market, mainly in terms of the principle of employment of professors and teachers, as well as the distribution of subjects by mutual agreement of the heads of departments.

The student was not only not allowed to choose subjects and professors, but also to give up boring classes and study in the library. Student truancy was considered a serious loss, with warnings of more than 30 hours per semester and expulsions of more than 74 hours per semester. The student had to sit in the auditorium, whether he liked the subject or the teacher, whether the knowledge was left behind or not!

Thus, in the traditional system, no materials were provided on what knowledge the student would acquire in the future, what professors and teachers would teach, the profile of the direction, and a summary of the subjects.

However, all information on the direction of education and specialties in all higher education institutions of developed countries, in particular, a brief syllabus of subjects reflected in the curriculum (subject identification, teacher information, lesson description, purpose of the subject, learning outcomes, teaching methods, science plans, literature), assessment methods), professors and teachers in the field of science and their achievements, a brief description of the requirements for a specialist in the labor market, ie what theoretical, practical knowledge, skills and professional qualifications are available on the official website of the university will be announced. At the same time, unfortunately, applicants find it difficult to find this information on the websites of our universities. In this regard, the time has come to form a culture.

ECTS requirements: initial steps.

As noted above, the first steps are being taken to move away from the negative aspects of the traditional education system and to work within the requirements of international standards.

At present, 33 higher education institutions of the country are actively working on the transition to a credit-module system. All forces are being mobilized to create this system.

An example of this is the fact that the El-Yurt Umidi Foundation regularly organizes seminars in foreign higher education institutions for citizens who are engaged in research and teaching activities, and who are familiar with the credit-module system. In addition, one of the members of the International Council of Experts under the El-Yurt Umidi Foundation has been appointed as an expert advisor to 10 self-funded higher education institutions.

In order to fully implement these processes, the relevant departments of the higher education institution are being established.

In particular, the Tashkent State University of Economics has a Department of Education Credit Management. From the 2020/2021 academic year, the department has begun work on the full transformation of all areas of education and specialties taught at the university into the ECTS credit-module system.

RESULTS:

Has the transformation process begun?

According to preliminary estimates, the university allocates 15 weeks per semester for undergraduate studies and 6 weeks for certification (3 weeks per semester for exams). Thus, the number of study weeks in 4 years is 144, certification is 24 weeks, and the total number of holidays is 204 weeks. Curricula for all disciplines and specialties are divided into two parts at each stage: basic and elective. Based on the ECTS requirement, it is planned to oblige the student to collect a total of 240 credits over 4 years out of 60 credits per year. In this case, the student will have to spend 2880 hours for 4 years of lectures, practical and laboratory classes and examinations, 4320 hours of independent study, a total of 7200 hours.

In our example, 1 credit = 12 academic hours + 18 hours of independent study. Therefore, 1 credit is considered to be equal to 30 hours and the student's weekly classroom load is equal to 20 hours. The amount of credit allocated for the internship is intended to be paid for by the relevant subject or disciplines.

What changes will take place during the transition to the new system?

The introduction of this system in higher education will improve the quality of teaching, ensure transparency, eliminate corruption, reveal the true knowledge of the learner and allow the student to study and work independently. Today, the European credit system is practiced in almost all higher education institutions of the ancient continent.

The introduction of a credit-module system is an important factor in teacher-student collaboration. In modular education, the teacher organizes, manages, advises and checks the process of mastering the listener. The student moves independently towards the directed object. The greatest emphasis is placed on students' independent learning.

The importance of independent learning in the learning process will increase, which in the future will increase the independence, creative initiative and activity of professionals. In the credit-module system, university students always have the opportunity to receive support and advice from teachers and classmates. This strengthens mutual understanding and helps to develop teamwork skills.

The transition to a credit-modular education system will also increase the commitment and demand for university professors. As noted above, with a modular learning system, the teacher not only serves as an informant and supervisor, but also as a consultant and coordinator. The leading role of the teacher in the pedagogical process is preserved.

One more thing. The credit system of education increases student exchange. This is because loans taken from one university are credited to another, and students can transfer from one university to another without losing credit. It is this system that allows Uzbek students to continue their studies at advanced foreign universities and remove complex bureaucratic barriers.

However, it should be noted that the blind and direct application of any international experience, without taking into account our values, without in-depth analysis of each of its elements, based on scientific evidence, can lead to certain negative consequences in the future. should not be forgotten either.

This does not mean that this system is fully consistent with our worldview, conditions, and values aimed at raising a harmoniously developed person. Therefore, we need to change the views of professors and students, who are active elements of the educational process, to absorb the requirements of this system, to form a unique culture.

After all, if we do not train personnel in accordance with the requirements of the labor market, we must feel that we will inevitably lose our place in the competition. But there is no better way or choice. After all, higher education institutions in all developed countries are following this path and achieving high results.

Once our traditional higher education system is not recognized around the world, we will have to apply advanced standards and systems to higher education institutions. Therefore, the pursuit of innovation and the continuation of efforts to radically reform the higher education system are the right decisions in all respects.

Why is it necessary to introduce a credit-module system in the teaching practice of higher education in Uzbekistan?

We will find the answer to this question by pointing out the obvious shortcomings of our traditional system, which is still used in practice in higher education in Uzbekistan.

- The inability of the traditional system, which is still used in higher education in Uzbekistan, to meet the requirements of the current information age;
- In the universities of Uzbekistan, students remain mainly listeners, as a result of which the staff trained due to poor practice does not give good results in the field;
- The large number of gaps in the evaluation system, and as a result, corruption in the evaluation process;

- Weakness of student innovation. That is, in this system, the student is given a task, and the student completes it and receives an assessment. Less emphasis is placed on student creative, independent work;
- The most important thing is that this system is not compatible with the developed education systems of the world. That is the main reason why we are not ready to compete with them.

In this context, we need a loan based on world experience to strongly reform the activities of Uzbek universities, to include them in the list of prestigious universities in the world, to develop perfect structures for free and creative education, to implement quality education that fully meets international standards. - chose the module system.

So, what has been done in the education system of Uzbekistan in this regard? For example, since 2013, medical higher education in our country

On October 8, 2019, the President of the Republic of Uzbekistan signed a decree "On the system of higher education of the Republic of Uzbekistan." Decree PF-5847 "On approval of the Concept of development until 2030" was made. Accordingly, from 2018 to 2019, the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi transferred to a credit-module system. It is also planned to increase the number of universities with a credit-module system from 2 to 85. The number of non-governmental, public-private partnership universities will be increased to 35. The decree also emphasizes the need to replace theory with practical skills. At present, up to 40% of our education is allocated for independent study, but according to the concept, this figure will increase to 60% by 2030 [3].

Now, I want to ask a question that explains the essence of our article.

Exactly why it is necessary to introduce this system in the teaching of mathematics?

CONCLUSION

We all know that the sciences that teach mathematics require strong thinking and reasoning. Teaching these subjects is a more complex process than teaching other subjects. The introduction of a credit-module system in higher education institutions for the teaching and learning of these subjects will significantly increase the effectiveness of education, create the basis for the practical application of mathematics. It will allow higher education institutions teaching mathematics in Uzbekistan to establish cooperation with prestigious mathematical universities around the world.

What are the benefits of the transition to a credit-module system for students in mathematics:

First, academic mobility means that students can easily transfer to any suitable university while retaining their credits. It doesn't matter if it's a world university or any of our universities. All you need to do is give them an outlet and the support they need to keep going.

Second, students are given the freedom to choose a teacher. This ensures academic communication between teacher and student.

Third, students will be able to choose subjects based on their preferences. Of course, there are (compulsory) subjects that must be studied, but the student can determine the subjects of independent choice. For math students, this is exactly the point. This is because it gives them enough time to master the sciences.

Fourth, students will be able to independently formulate their curriculum and ensure the transparency of their assessments. This will automatically eliminate corruption in the education system.

Unlike the current system of education, in addition to the compulsory subjects, the credit system includes elective subjects and a student's personal lesson schedule. Students will not be expelled or transferred from course to course. If you do not collect the required credits in the subject, you will have to re-study and retake the exam in the same subject. Re-reading is a series of lectures, labs, and workshops from the first lesson to the last. Re-tuition is paid. Its loan amount is calculated based on the contract amount. A diploma of higher education is issued only after the accumulation of the specified credits. At the end of the semester, 50% of the students' marks are given by the science teacher and 50% by the university administration. That is, during the semester, mid-term examinations, homework assignments and practical (laboratory) work are evaluated by professors and teachers. The final control will be taken by the university administration. There is no teacher-professor. According to experts, in order to collect credits, students are required to attend classes, complete tasks on time, demonstrate their level of knowledge.

What needs to be done to transfer higher education institutions in Uzbekistan to the credit-module system? (My recommendations).

First of all, it is necessary to develop a regulation on measures to radically improve and increase the efficiency of the system of training in higher education institutions, developed by the Ministry of Higher Education for each university.

And on this basis, to develop a systematic curriculum based on the practice of foreign universities in order to ensure the intensity of education.

One of the biggest advantages of the credit-module system is the introduction of reasonable reduction of subjects in all universities.

For example, the Muhammad al-Khwarizmi Tashkent University of Information Technology previously had 43 subjects in the curriculum, but after the introduction of the credit-module system, their number decreased to 31.

Ensure that the university creates a special site for the student's independent work, homework and laboratory assignments.

On this site, students download the tasks in the given order, and the teacher defends it orally. In this case, the student's rating is set deadline both online and by the teacher. Students who do not submit independent work and homework on time will not be evaluated. There is no re-submission in this system. Can only be re-read.

At the end of each semester for students in the field of mathematics to organize control and test assignments based on world standards and to organize the strengthening of students' knowledge on their basis.

This will ensure that our students are able to meet world standards.

To teach students the skills of using special mathematical utilities (MATlab, MATHcad, geogebra...) in mathematics and to create conditions for their widespread use in practice.

From a scientific point of view, this will help them to complete calculations more quickly and to develop a wider range of mathematical concepts.

Provide a wide range of library resources to all universities in both print and electronic formats.

Of course, it takes enough time for our students to adapt to such a system. Preparing them for this is, first of all, the task of pedagogical teachers. Therefore, in order to form such a system, first of all, it is necessary to provide universities with professional and highly qualified teachers.

At the same time, the educational credit-module system requires consideration of the principles of improving the organization of the educational process, control over students' knowledge, financial incentives for teachers and professors of higher education institutions and improving wages. In addition, it is important that students are provided with textbooks and materials, that the current standards meet the requirements of the education credit system, and that there is a personal press center equipped with modern equipment and reproduction techniques. I am convinced that the introduction of such a system in the education system of Uzbekistan will be a major turning point in the development of all sectors of our country. After all, educated and creative personnel from higher education are the foundation of the future of our country.

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