

Development of curriculums and science programs based on ECTS (European credit transfer system)

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Abstract: *In this article analyzes the process of developing curricula and course programs based on ECTS (European Credit Transfer and Accumulation System). The article examines the role of the ECTS system in higher education, the alignment of credit workload with students' independent learning, and the theoretical foundations for creating curricula in a transparent and flexible manner. The study also explores the role of the ECTS system in assessing student workload, promoting independent learning, and ensuring academic mobility. In the design of course programs, special attention was given to learning outcomes and credit distribution. The article concludes with recommendations for more effective development of curricula and course programs based on the ECTS system, as well as optimizing curricula and programs in accordance with the system.*

Keywords: *credit, grading system, high level, good, satisfactory, unsatisfactory, ECTS, transparency, student mobility, diploma supplement, document analysis, comparative analysis, learning outcomes, credit load, assessment, academic mobility*

INTRODUCTION

The European Credit Transfer and Accumulation System (ECTS) is an important tool for assessing the workload of students in higher education institutions, for transparent and efficient organization of the educational process, and for developing academic mobility. The ECTS system allows for the calculation and transfer of credits based on uniform standards within the European educational area, which facilitates interaction between students and different higher education institutions.

The system was developed to create a common standard for all universities in Europe. This system allows students to study, accumulate credits, and transfer between European universities.

Basic principles:

- Credits: Each course is valued at a certain number of credits, which indicates the time spent on mastering the course material. One year of study is usually equivalent to 60 ECTS credits, corresponding to 1500-1800 hours of study.

- Rating system:

A (High level) - excellent;

B (Good) - above average result;

C (Satisfactory) - Average level;

D (Satisfactory) - Meets the minimum requirement;

F (Unsatisfactory) - He failed the course.

- Transparency: Universities provide detailed descriptions of their programs, course objectives, assessment methods, and requirements.

- Student mobility: Through ECTS, a student can transfer to another university and keep the credits. For example, through the Erasmus+ program, students can continue their studies in different countries.

Diploma application: Graduates are provided with a diploma supplement with detailed information about courses, credits earned, and grades.[1]

The introduction of the ECTS system in higher education institutions of the Republic of Uzbekistan is one of the country's obligations within the framework of the Bologna process. This system is important not only in assessing the academic achievements of students, but also in designing curricula and subject programs. Curricula and programs based on ECTS stimulate independent learning of students, coordinate with classroom activities, and make the learning process more flexible.

Today, the development of curricula and subject programs based on the ECTS system involves a number of theoretical and practical problems. In particular, the fairness of the distribution of credits, the combination of independent learning and practical training, as well as the issue of clearly defining learning outcomes. Therefore, designing curricula in accordance with ECTS requirements is important not only for increasing student learning efficiency, but also for improving the quality of education and adapting higher education institutions to international standards.

LITERATURE ANALYSIS

The European Credit Transfer System (ECTS) is one of the main tools in higher education for calculating student workload, making the educational process transparent and promoting academic mobility. The “ECTS Users' Guide” published by the European Commission provides a detailed explanation of the theoretical foundations of the system, the equivalence of 1 credit to 25–30 hours, and the ratio of independent learning activities of the student to classroom lessons. This guide provides an overview of the role of ECTS in higher education and the organization of credit calculation based on uniform standards.[2]

The documents developed within the framework of the Bologna Process have noted the introduction of ECTS as an important tool in the European Education Area. Research shows that the ECTS system not only increases the academic mobility of students, but also ensures transparency and flexibility in the process of designing curricula and subject programs.[3] Curricula developed on the basis of ECTS provide students with opportunities for choice, combine classroom training with independent work, and develop student self-management competencies.

Research also sheds light on the ECTS assessment mechanism and its impact on learning outcomes. Weber and Muukkonen argue that ECTS can improve the quality of education by defining learning outcomes.[4] Learning outcomes indicate what knowledge, skills and competencies a student has acquired in a course or subject. This not only clarifies the assessment process, but also allows for the design of curricula to set clear objectives and outcomes for each subject.

Studies on the implementation of ECTS in the higher education system of Uzbekistan show that for the system to function effectively, it is necessary to align students' independent work activities and practical training. For example, the regulatory documents of the Ministry of Higher and Secondary Specialized Education of the Republic of Uzbekistan provide for the introduction of ECTS and the definition of the distribution of credits, but in practice, the alignment of assessment criteria and subject programs with learning outcomes is still problematic in some higher education institutions.[5] The literature notes that there are problems with the structure of credit load and curricula. For example, the distribution of time between classroom and independent work can sometimes be uneven for students, which can limit the main purpose of ECTS - student self-management and independent learning. Therefore, when developing subject programs, it is necessary to clearly define credits and learning outcomes, and to coordinate elective and compulsory subjects.

The analysis shows that the ECTS system is a powerful tool not only for standardizing the educational process and increasing mobility, but also for the effective design of curricula and subject programs. At the same time, the following aspects are important for the successful implementation of the system: monitoring the independent work of students, aligning assessment criteria with learning outcomes, and integrating practical training with theoretical knowledge.

In general, the literature review shows that the development of curricula and subject programs based on the ECTS system is of great importance in improving the quality of education, stimulating the academic activity of students, and bringing higher education institutions into line with international standards. Therefore, the development of recommendations for optimizing curricula and designing subject programs based on ECTS is an urgent scientific and practical issue.

METHODOLOGY

This study used document analysis and comparative analysis methods to study the process of developing curricula and subject programs based on ECTS. The main goal of the study is to determine how the ECTS system affects students' academic activity, independent learning, and the effectiveness of curricula.

1. Document analysis:

Document analysis was used to study the existing scientific and official materials on the ECTS system. Document analysis allowed for an in-depth analysis of aspects such as student credit load, compliance of subject programs with learning outcomes, and the combination of independent learning and practical training. At the same time, the theoretical foundations of the ECTS system and the practices of its application in higher education were identified using the documents.

2. Comparative analysis:

Using the comparative analysis method, the experience of using ECTS in the higher education systems of Uzbekistan and Europe was compared. Through this method, the following was studied:

- credit allocation in curricula and subject programs;
- the ratio of compulsory and elective subjects;
- balance between student independent learning activities and classroom activities;
- consistency of learning outcomes and assessment criteria.

The comparative analysis allowed us to identify shortcomings in the experience of Uzbekistan and best practices in Europe. On this basis, recommendations were developed for optimizing curricula and subject programs using the ECTS system.

3. Stages of the study:

- Collection and analysis of official documents on the ECTS system.
- comparison of curricula and subject programs in higher education institutions of Uzbekistan with ECTS requirements.
- draw an analytical conclusion based on the results of the study, credit load, and assessment of independent work performance.
- develop recommendations for more effective design of curricula and science programs.

DISCUSSION AND RESULTS

The results of the study, based on a literature review and comparative analysis, showed that designing curricula and subject programs based on the ECTS system significantly contributes to improving the quality of higher education. The following main results were identified during the study:

1. Credit load and student independent learning:

The results of the document analysis showed that the ECTS system calculates 1 credit with a student workload of 25-30 hours. The ratio between classroom training and independent work allows the development of student self-management competencies. The results of a comparative analysis conducted in higher education institutions of Uzbekistan show that in some disciplines, independent work is not sufficiently taken into account, which limits the ability of students to self-manage and achieve learning outcomes.

2. Compatibility of learning outcomes and subject programs:

The comparative analysis revealed that in European ECTS-based curricula, clear learning outcomes are defined for each subject. However, in the experience of Uzbekistan, the clarity and measurement of learning outcomes is sometimes not sufficiently implemented. Therefore, when optimizing curricula, there is a need to clearly define learning outcomes for each subject.

3. Distribution of compulsory and elective subjects:

The results of the analysis showed that curricula based on the ECTS system provide students with flexibility in their interests and specializations through elective subjects. While the European experience focuses on the ratio of elective subjects to compulsory subjects, in some institutions in Uzbekistan the number of elective subjects and their distribution in the credit load are not compatible with the independent learning of students.

4. Assessment and academic mobility:

The analysis of the documents showed that the ECTS system allows for a clear definition of assessment criteria and a transparent assessment of a student's academic achievements. According to the results of the comparative analysis, there are some problems in harmonizing assessment criteria with learning outcomes in institutions where the ECTS system has been introduced in Uzbekistan. This complicates the process of correctly calculating credits for students and transferring them to other institutions.

5. General conclusion:

The results showed that developing curricula and subject programs based on the ECTS system increases students' independent learning, self-management skills, and academic engagement. At the same time, for the successful implementation of the system, it is necessary to clearly define learning outcomes, align credit load and elective subjects, and standardize assessment criteria.

CONCLUSION AND SUGGESTIONS

The results of the study showed that the development of curricula and subject programs based on the ECTS (European Credit Transfer and Accumulation System) system is an effective tool for improving the quality of education in higher education, encouraging independent learning activities of students, and developing academic mobility. Document analysis and comparative analysis revealed that the credit load, learning outcomes, and assessment criteria in curricula based on the ECTS system help develop student self-management skills, and also create flexibility for students through elective subjects.

The study also revealed that there are some problems in implementing the ECTS system in higher education institutions in Uzbekistan:

- learning outcomes are sometimes not clear and measurable;
- Insufficient time balance between independent work and classroom training;
- Difficulties in aligning assessment criteria with learning outcomes.

In order to address these issues and implement the system more effectively, the following recommendations have been developed:

1. Clearly defining learning outcomes: Defining learning outcomes for each subject in a clear, measurable, and assessable form, which simplifies assessment and credit allocation.
2. Optimize credit load: Adjust the ratio between classroom instruction and independent work activities, increasing student self-management and independent learning opportunities.
3. Expanding electives: Making the curriculum flexible by giving students the opportunity to choose subjects that suit their interests.
4. Standardize assessment criteria: Create an assessment system aligned with learning outcomes and transparently assess students' academic achievements.

5. Combining practice and theoretical knowledge: Improving the quality of education by integrating practical training and laboratory work with theoretical knowledge in science programs.

In general, curricula and subject programs developed based on the ECTS system are important in increasing the academic activity of students in higher education, improving the quality of education, and aligning higher education institutions with international standards. Therefore, the implementation of recommendations based on the research results is relevant and useful for higher education institutions.

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