

## INTEGRATIVE METHODOLOGICAL FRAMEWORK FOR USING STEAM AND SQ3R METHODS IN TEACHING NATURAL SCIENCES

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### Introduction

This article analyzes the ways and effectiveness of organizing lessons through the integration of STEAM (Science, Technology, Engineering, Arts, Mathematics) and SQ3R (Survey, Question, Read, Recite, Review) methods. The STEAM approach serves to develop students' creative thinking, form research skills, and consolidate practical knowledge. The SQ3R method, on the other hand, helps to increase the efficiency of working with text, develop critical thinking, and deeply master the educational material. This integrated approach allows students to make the learning process more interactive and effective. The results of the study show that by using these methods, students' mastery level increases, they develop a tendency to think independently and solve problems. Also, this approach helps teachers to organize the lesson process in an interesting and effective way.

### Keywords

STEAM, SQ3R, method, technology, natural science, integration, teaching, education, structure.

**Introduction.** The rapid development of science and technology in the world, its rapid introduction into the education system, leads to the development of pedagogical technologies in the education system and the integration of education.

Today, special attention is paid to the development of the education sector in our country. At the same time, extensive efforts are being made to improve the quality of education and further develop the education system in the world. The integration of the education system is also leading to changes in teaching technologies, the emergence of new methods and pedagogical technologies in society and their introduction into the education system through the effective use of approaches to the national education systems of other nations.

The uniqueness of the digital learning environment. Leading world research institutions such as Learning in a Digital World, Massachusetts Institute of Technology (MIT), and the Organization for Economic Cooperation and Development (OECD), which began its work in 1961, have been conducting research to find solutions to various problems that have arisen in the financial sector over the past period. Especially at the beginning of the new century, this organization has launched PISA, a program aimed at developing general secondary education, which is the main link in world education. (The

Programme for International Student Assessment) – The joint use of modern and national interactive methods in the development of pedagogical technologies based on the international program for assessing student literacy leads to the emergence of integration in the state and national education systems. The introduction of modern technologies, along with increasing efficiency, also serves to improve the quality of education.



Innovative approaches to improving the quality of education. The development of the education system at the current stage of new Uzbekistan imposes new requirements on the content and quality of pedagogical education, which indicates the need to increase professional pedagogical activity. Today, the rise of information technologies around the world requires the widespread use of new technologies in the education system.

**Materials and methods.** The significance of innovative technologies in teaching foreign language competencies is immense. Utilizing innovative technologies in foreign language instruction ensures lessons are both engaging and effective. Innovative technology involves methods to enhance educational efficiency, designing and applying various pedagogical processes to improve knowledge acquisition. Its primary goal is to introduce new approaches and modifications in the teaching process, requiring the use of interactive methods. Interactive methods, in turn, focus on fostering the active participation and independent thinking of each learner involved in the educational process. When these methods are implemented, learning transforms into an engaging activity. Moreover, the application of interactive methods helps develop learners' skills and competencies in independent work. Currently, the rapid changes in our country are paving the way for significant advancements in the education system, including the accelerated development of foreign language acquisition and the improvement of global standards. This progress demands a creative approach within the education system.

The social needs of society are closely tied to the creative thinking and innovation of students in higher education institutions, which are realized through their educational activities. Prominent scholars from the Commonwealth of Independent States (CIS), such as T. Barisheva, Y. Volkova, J. Guilford, and Y. Zhigalova, have conducted extensive research on the impact of creativity within the educational environment. In their works, they described the process of creating innovative products that embody the characteristics of creativity among the subjects involved in the creative process.

**Conclusion.** In conclusion, developing competencies among students is a multifaceted task that requires the integration of effective teaching methods, cultural immersion, mentorship, and continuous support. These strategies not only help students overcome potential challenges but also enable them to become proficient communicators in both native and foreign languages, equipping them for success in a globalized world. Educators and institutions must actively implement these strategies to ensure learners are well-prepared for the linguistic demands of their chosen careers and can participate effectively in an interconnected society. The effective use of innovative technologies in teaching foreign languages allows for a comprehensive and interesting lesson, and interest in innovative technologies is growing day by day. Innovative technologies teach students to think independently, analyze, and draw conclusions.

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