PROBLEMS AND SOLUTIONS IN IMPLEMENTING INTERACTIVE EDUCATIONAL PLATFORMS IN TEACHING PROGRAMMING IN HIGHER EDUCATION.

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Abstract: This article analyzes the pressing problems associated with the implementation of interactive educational platforms in the process of teaching programming disciplines in higher education institutions, as well as the ways to overcome them. The rapid development of modern information technologies necessitates the widespread use of digital and interactive tools in the educational process. During the study, key challenges were identified, including insufficient digital competence of instructors, underdeveloped technical infrastructure, students' low readiness for independent learning, and the lack of full methodological integration of interactive platforms into the teaching process. As solutions to these problems, the article proposes retraining and professional development of instructors, adapting interactive platforms to the content of academic disciplines, organizing practical classes in virtual environments, and strengthening the competency-based approach in education. The research findings contribute to improving the effectiveness of teaching programming disciplines and enhancing students' knowledge and skills in higher education.

Keywords: higher education, programming education, interactive educational platforms, digital education, information technologies, competency-based approach, distance learning, virtual learning environment.

Introduction

Today, the rapid development of digital technologies has a direct impact on all levels of the education system, particularly on the process of teaching programming disciplines in higher education institutions. Since programming subjects require not only theoretical knowledge but also advanced practical skills, the use of modern interactive educational platforms plays a crucial role in ensuring effective instruction. At a time when traditional teaching methods no longer fully meet the demands of the modern labor market, there is a growing need to develop students' competencies such as independent thinking, problem-solving, and creative approaches through interactive and digital learning tools.

Interactive educational platforms provide students with opportunities to write code in real time, analyze errors, work on projects, and participate in collaborative discussions during the process of learning programming. However, the integration of these platforms into higher education also gives rise to a number of organizational, technical, and methodological challenges. Therefore, this article aims to analyze the problems related to

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the implementation of interactive educational platforms in teaching programming in higher education and to propose effective solutions to address these challenges.

Problems and Analysis

In the implementation of interactive educational platforms in higher education institutions, personnel-related issues emerge as a primary challenge. Many faculty members are accustomed to traditional teaching methods and lack sufficient knowledge and skills in the effective use of digital technologies. As a result, the use of interactive platforms often remains superficial, and their impact on the quality and effectiveness of education is not clearly evident.

The second major problem is the insufficient development of technical infrastructure. In some higher education institutions, low internet bandwidth, a shortage of modern computer equipment, or the absence of licensed software hinder the full utilization of interactive platforms. This situation significantly reduces the effectiveness of the educational process, especially in programming disciplines that require continuous practical engagement.

The third problem is methodological in nature. In many cases, interactive educational platforms are introduced without proper alignment with the course content and curriculum. Due to the lack of coherence between platform-based tasks and the academic syllabus, students tend to focus solely on completing assignments, while insufficient attention is paid to deep understanding and the systematic development of knowledge.

In addition, a low level of responsibility and motivation for independent learning among students represents another significant challenge. Since interactive platforms largely rely on self-directed learning, students who lack adequate self-regulation and planning skills often face difficulties in effectively engaging with these platforms.

Practical Solutions

To address the identified problems, it is essential to first implement systematic measures aimed at enhancing the digital and pedagogical competencies of instructors. In this regard, the regular organization of professional development courses, seminars, and training sessions on the use of interactive educational platforms is of particular importance. Instructors should not only master the technical aspects of platform usage but also learn how to methodologically integrate these tools into the teaching process.

In order to improve technical infrastructure, higher education institutions need to establish high-speed internet connectivity, develop modern computer laboratories, and continuously update software resources. In particular, the use of online code editors, virtual laboratories, and simulators for programming courses can significantly increase the practical effectiveness of instruction.

From a methodological perspective, it is crucial to closely align interactive educational platforms with the curriculum. Assignments should be based on real-world problems and designed with a focus on project-based and problem-solving approaches. This, in turn, enhances students' practical thinking skills and professional preparedness.

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Furthermore, to encourage independent learning among students, it is recommended to improve assessment systems and make use of rating and feedback mechanisms. Through automatic assessment, error analysis, and personalized recommendations provided by interactive platforms, it is possible to enhance students' learning outcomes and motivation.

Conclusion

The conducted analysis shows that the implementation of interactive educational platforms in the process of teaching programming disciplines in higher education institutions is one of the key requirements of modern education. These platforms play an important role in developing students' practical skills, fostering independent thinking, and integrating theoretical knowledge with practical application. However, the effective integration of interactive educational tools into the educational process is associated with a number of organizational, technical, and methodological challenges.

According to the research findings, insufficient digital competence of instructors, underdeveloped technical infrastructure, and the lack of alignment between interactive platforms and academic curricula negatively affect the effectiveness of programming education. In addition, students' low level of readiness for independent learning and insufficient learning motivation also constitute significant challenges.

To overcome these problems, the study substantiates the necessity of retraining instructors in modern information technologies, strengthening technical infrastructure, integrating interactive educational platforms with curricula, and organizing the educational process based on a competency-based approach. Systematic and purposeful use of interactive educational platforms contributes to improving the quality of teaching programming disciplines, enhancing the professional preparedness of future specialists, and accelerating digital transformation in the higher education system.

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