



CHALLENGES OF USING WEB PLATFORMS IN DEVELOPING STUDENTS' BIOLOGICAL COMPETENCE

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***Abstract.** This article highlights analyses the upbringing process of biology education and organization about related of scientists' choice analysis made. Also, the existing problems of using web platforms in developing students' biological competence are presented.*

***Key words:** web-platform, information-educational environment, information technologies, distance learning , professional competent.*

Today, with the expansion of the global network and the creation of educational web platforms on the internet, there is a growing need to develop modern approaches for integrating these platforms into the educational and upbringing processes of higher education institutions, as well as for using them to enhance students' professional competence.

In our country, researchers such as J.O. Tolipova [1], M.S. Usmonova [2], A.K. Rakhimov [3], Z.A. Mardanov [4], and S.F. Salimova [5] have conducted studies on these issues. Their research focuses on the theory and practice of enhancing the scientific and methodological training of biology teachers, developing students' scientific worldview in an innovative educational environment, improving the preparation of future biology teachers for innovative professional activities through modular technologies and an integrative approach, as well as refining a methodological system for assessing the level of professional competence among future biology teachers.

Moreover, in the Commonwealth of Independent States, scholars such as N.P. Stepanova [6], S.B. Bakhvalova [7], E.N. Belyaeva [8], and E.N. Arbuzova [9] have carried out research aimed at developing methods for using the integrated modular approach in teaching biology in pedagogical higher education institutions, improving students' research skills in in-depth biology studies, enhancing the quality of biology education through the organization of students' ecological activities, fostering emotional and value-based attitudes toward wildlife, and designing a reflective teaching system using innovative educational-methodological resources in biology.

In the above-mentioned studies by scholars, various approaches have been explored to enhance the effectiveness of teaching biology in the continuous education system and to develop students' professional competence. However, these studies have not paid sufficient attention to the use of digital education technologies—particularly web platforms—in the biology education and upbringing process or in the development of students' biological competence.

At the same time, in our country, research related to the use of digital learning tools to improve the effectiveness of teaching biology in higher education institutions has been conducted by scholars such as L.M. Qaraxonova [10], Sh.B. Xasanova [11], and M.N. Ibodova [12]. Although these pedagogical studies are dedicated to the methodology of using digital educational tools in teaching biology within the continuous education system, they do not adequately address the potential of using web platforms hosted on the global internet to enhance biology education and develop students' biological competence.

Meanwhile, scholars such as U.B. Baxodirova [13], G.S. Ergasheva [14], G.V. Sharapova [15], D.T. Yakhshiboyeva [16], and V.A. Smirnova [17] have conducted research focused on the use of web platforms to improve the effectiveness of teaching biology in the educational process. For instance, U.B. Baxodirova developed a methodology for using virtual learning platforms in teaching microbiology to enhance students' skills in analysis and synthesis, creative activity, as well as convergent and divergent thinking, alongside their professional competencies [13].

G.S. Ergasheva improved the methodology for using the Moodle web environment to support the independent learning activities of future biology teachers. She also developed a methodological system aimed at increasing students' abilities, talents, and interests by incorporating interactive resources, multimedia products, virtual labs, crosswords, and intellectual games [14].

G.V. Sharapova proposed a methodology for using information-educational platforms in teaching immunology to foster students' analytical, synthetic, creative, and cognitive thinking, as well as to develop their professional competencies [15].

D.T. Yakhshiboyeva focused on organizing students' independent learning in biotechnology through the development of distance education services, including virtual laboratories and information-educational environments, using advanced pedagogical and information technologies [16].

V.A. Smirnova developed a methodology for forming cognitive learning activities within an information-educational environment during biology instruction. She also designed a model for shaping cognitive learning activities within a subject-based information-

educational environment for 5th–6th grade biology courses, supported by methods, approaches, and pedagogical technologies that aid in mastering the subject matter and developing universal cognitive learning skills [17].

Although these scholars have proposed some approaches to using web platforms in improving the effectiveness of biology education and developing students' biological competence in higher education, their research does not provide a fully scientific foundation for a comprehensive methodology on using web platforms specifically for this purpose. Therefore, the proposed research—focused on improving the methodology for using web platforms to develop students' biological competence—is considered a highly relevant and timely issue.

Using web platforms in the educational process contributes to increasing students' share of independent work and helps cultivate qualities such as responsibility, organizational skills, independence, and the ability to assess their own strengths and capabilities.

If in 2020, teachers were mainly used to preparing electronic presentations using the Power Point program, now it is possible to use the cloud-based Presiden service to create interactive presentations. In addition, teachers can use virtual panels in their work: a virtual space where several materials can be displayed at once. For example, Miro, Google Jamboard virtual interactive whiteboards for teachers modern number tool become service This cabinet-based material information can be clearly displayed, but also allows students to create associations in a single space. It serves as an effective tool for engaging students in the learning process by sending them through a tool such as a virtual whiteboard [22, 23].

In 2020, due to the widespread shift of educational institutions to distance learning formats, scholars analyzed and published reviews of various web platforms that could assist teachers in online education [18, 20, 21, 22, 23]. These researchers scientifically substantiated that integrating web platforms into the educational and instructional processes of higher education institutions can contribute to the development of students' professional competence. According to their findings, web platforms help increase students' interest in academic subjects, enhance the system of independent learning, and provide opportunities to organize lessons using innovative technologies.

Therefore, the use of web platforms in developing students' professional competencies—including their biological competence—can be recognized as a current pedagogical issue.

Our research focuses on studying these challenges and finding ways to address them. To tackle this issue, an initial observation phase was conducted during the 2024–2025 academic year with biology education students at Navoi State University.

During this phase, sessions with faculty members in the biology department were designed using web platforms. Additionally, lectures, practicals, and laboratory sessions were observed to assess students' engagement with the subject of biology. It was found that professors and instructors were actively using computer technologies to deliver subject-specific courses. However, it was also observed that web platforms were rarely used in course design and in organizing students' independent learning activities.

This highlights a critical concern in the current context of digitalization, emphasizing the importance of effectively integrating web platforms into modern educational practices.

Thus, based on the analysis of scientific and methodological literature related to the research problem, as well as the current state of biology education in higher education institutions, several key issues have been identified regarding the use of web platforms in developing students' biological competence:

1. Developing web platforms aimed at enhancing students' biological competence in accordance with the sanitary and hygienic norms and regulations of the Republic of Uzbekistan;
2. Improving the skills of professors and instructors in using international web platforms related to biology education;
3. Cultivating a culture among students for effectively using international web platforms in the study of biology;
4. Creating scientific and methodological resources for designing biology lessons using web platforms;
5. Developing mechanisms for using web platforms to support students' independent learning in biology.

In conclusion, addressing the above-mentioned set of problems is essential for effectively developing students' biological competence. By solving these issues, it becomes possible to organize biology lessons using modern digital educational technologies and foster students' logical and creative thinking in the field of biology, as well as enhance their professional competence.

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