MODERN TEACHING TOOLS USED IN TEACHING PLANT PHYSIOLOGY

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Abstract. This methodology is designed for effective use of virtual technologies in biology teaching, focusing on a practical approach. These methods aim to create interactive and experiential opportunities for students, help them visualize and better understand biological processes, and ease the learning experience. The goal is to create interactive and virtual learning opportunities in biology education, inspire students to study biological processes, and make learning easy, engaging, and experiential through virtual technologies.

Keywords: Biology education, multimedia presentations, higher education, interactive lessons, technology, didactics.

Biology, as the study of the interactions between living organisms and their environment, requires the use of innovative technologies in the educational process. Relying solely on textbooks makes it difficult to fully explain the structure and functions of organs to students. Therefore, when visual materials, diagrams, and three-dimensional virtual models are used in biology lessons, students understand the topic more deeply and retain the information for longer periods. For example, studying cell structure through text can be complex, but visual presentations provide a clearer image to the students.

Currently, using electronic textbooks and multimedia resources is expanding the opportunities for students to work independently. The essence of the new approach is to move away from traditional compulsory teaching methods and base the educational

process on modern pedagogical and information technologies. This helps develop students' critical thinking, independent activities, and teamwork skills.
In the modern educational process, the use of technologies significantly simplifies students' learning process. Especially in subjects like biology, which often involve complex concepts and theories, making the lesson interactive helps provide more effective education for the students.

The advantages of digital technologies over traditional methods are many: the visual presentation of materials, the ability to effectively check knowledge, various organizational forms of student work, and different teaching methods for the educator. Many biological processes are complex, and students with the ability to think abstractly face challenges when studying these abstract concepts. Without images, they cannot understand or study the processes effectively. Their abstract thinking develops through visualizations. Multimedia animation models help students form a holistic view of biological processes, and interactive models allow students to independently design processes, correct mistakes, and monitor their knowledge.
By visualizing the educational material through multimedia presentations, it can be delivered in a more illustrative and comprehensible way. Therefore, organizing biology lessons using multimedia tools in higher education is considered relevant. Multimedia presentations are widely used in biology teaching. They provide the following advantages to teachers and students:

- Simplifies the explanation of complex biological processes using visual materials.
- Presentations enriched with interactive elements ensure active participation from students during lessons.
- The learning process becomes more engaging and understandable.

In biology, when explaining complex biological processes, cell structures, physiological

systems, or ecological relationships, interactive platforms, visual simulations, and virtual laboratories play a key role. These tools not only help students understand but also enable teachers to deliver lesson content effectively. This article discusses the role of digital technologies, particularly interactive platforms, their advantages, use cases, and existing challenges in biology teaching.
Various software tools are used for preparing multimedia presentations. The following tools stand out for their convenience and features:
- Microsoft PowerPoint – the most popular tool, which allows for the addition of various visual materials, graphics, and animations.
- Prezi – offers innovative solutions for dynamic data presentation.
- Camtasia – a video editing tool useful for creating video lessons and visual resources in biology.

Multimedia presentations increase students' knowledge retention levels. These presentations also stimulate students' independent research and creative activities. In subjects like biology, multimedia tools play a vital role in developing students' imagination and analytical thinking abilities. While developing multimedia presentations, it is crucial to consider not only technological possibilities but also didactic principles. These principles play an important role in enhancing the effectiveness of the educational process.

A crucial feature of didactic tools is their ability to incorporate information about the structure of tasks, goals, and interactions with other educational tools. This feature defines the manifestation of integrative functions and the motivational function of this type of educational tool. In the context of organizing independent cognitive activity, the manifestation of these functions is especially significant.

References:

1. Azamov, S.M., 'Developing Multimedia Presentations for Biology Lessons in Higher Education,' Young Scientists Scientific-Practical Conference, 2024, p. 99
2. Kamolova, E., 'Digital Technologies in Biology Teaching,' Pedagogy, Psychology, 2024, p. 266
3. Zamonova, M.V., 'The Content and Methodology of Biology Teaching in Higher Education Based on Digital Technologies,' Economics and Society, 2025, p. 560
4. Nuriddinova, N.N., 'The Role of Digital Technologies in Biology Teaching: Opportunities of Interactive Platforms,' Science and Innovation Scientific-Practical Conference, 2022, p. 21
5. Rozmatova, Sh.T., Ashirbayeva, O., 'Using and Improving the Mechanisms of Didactic-Visual Tools in Biology Teaching,' Interpretation and Research Scientific-Methodical Journal, 2013, p. 78