



Scientific and Pedagogical Aspects of Improving the Methodology of Teaching the Course “Invertebrate Zoology” Based on the Digitalization of Education

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Abstract: *The article deals with the issues of improving the methodology of teaching the course “Invertebrate Zoology” based on the digitalization of education in modern Uzbekistan.*

Keywords: *students of pedagogical universities, biological education, invertebrate zoology course, professional competence of teachers.*

In the Republic of Uzbekistan today, in the era of globalization and digitalization, a new society is being built. At the solemn ceremony dedicated to the 29th anniversary of the independence of the Republic of Uzbekistan, President Shavkat Mirziyoyev voiced the idea that “...Today, when the powerful potential of our people is fully realized, the foundation of a new Renaissance epoch - the third Renaissance is being laid in Uzbekistan. After all, today's Uzbekistan is not yesterday's Uzbekistan. And our people are no longer the same as they were yesterday” [1]. This indicates that Uzbekistan has entered a new stage - a stage of huge transformations and achievements.

At present, the country pays great attention to the improvement of the educational sphere, which requires the training of highly qualified, professional, competitive personnel. Modern teachers must first of all take care of providing children with a quality education, as well as improving the methods of teaching self-improvement [2]. Therefore, there is a need to improve the methodology for the formation of professional competence of future biology teachers based on the introduction of modern methodological approaches and technologies.

Today, it is considered relevant to introduce into the practice of teaching teaching staff according to methods based on competencies and aimed at developing professional skills [3]. In the era of globalization and digitalization, comprehensive measures are being implemented in the republic to actively develop the digital economy, as well as to widely introduce modern information and communication technologies in all sectors and areas, primarily in public administration, education, healthcare and agriculture [4]. The formation of modern pedagogical skills in the era of digitalization is carried out in the context of automation of education management and the creation of a comprehensive analysis system using modern information and communication technologies, the further development of electronic resources and distance education, and the popularization of IT professions among students [5]. The widespread introduction of digital technologies at all stages of the education system, increasing the level of digital knowledge necessary for the modern economy, improving the education infrastructure requires the modern education system to ensure quality and a high level of training of personnel who have deeply mastered modern information and communication technologies [6].

Particular attention has recently been paid to the development of biology and chemistry in Uzbekistan. Thus, in the Decree of the President of the Republic of Uzbekistan dated August 12, 2020 No. PP-4805 “On measures to improve the quality of continuous education and the effectiveness of science in the areas of Chemistry and Biology”, it is noted that the development in our country of the subjects “chemistry” and “biology”, improving the quality of education and the



effectiveness of science in these areas are identified as one of the priority tasks of the State Program “Year of Development of Science, Education and the Digital Economy” [7]. The Action Strategy for the five priority areas of development of the Republic of Uzbekistan for 2017-2021 [8], among the leading areas, indicates the need to develop the social sphere, which provides for the improvement of science and education, which, in turn, solves the problem of increasing the interest of future biology teachers in the use of modern, innovative, multimedia educational technologies. However, to date, to improve the quality of education and increase the interest of students in the study of biological sciences, modern information and communication, as well as multimedia technologies, are not actively used. In the context of this, the improvement of the methodology for the formation of professional competence of future biology teachers is of great importance (on the example of teaching the course of invertebrate zoology).

This research work to a certain extent serves to implement the tasks set in the Law of the Republic of Uzbekistan No. ZRU-637 “On Education” dated September 23, 2020 [9], in the Decree of the President of the Republic of Uzbekistan No. UP-5763 dated July 11, 2019 “On measures to reform the management in the field of higher and secondary specialized education” [10], in the Decree of the President of the Republic of Uzbekistan No. UP-5847 “On approval of the Concept for the development of the higher education system of the Republic Uzbekistan until 2030” dated October 8, 2019 [11], in the Decree of the President of the Republic of Uzbekistan dated July 11, 2019 “On measures to introduce new management principles in the system of higher and secondary specialized education” No. PP-4391 [12], in the Decree of the President of the Republic of Uzbekistan No. PP-4623 “On measures for the further development of the field of teacher education” dated February 27, 2020 [13].

In the context of the above, the purpose of our study is to improve the teaching methodology for the course “Invertebrate Zoology” based on the digitalization of education (on the example of pedagogical higher educational institutions).

To achieve this goal, it becomes necessary to solve the following tasks:

- to consider and substantiate the concepts of “professional competence” and “digitalization” to improve the teaching methodology for the course “Invertebrate Zoology” based on the digitalization of education, and to determine the role of professional competence to ensure the quality of teaching the subject in the context of digitalization;
- to improve the methodology of teaching the course “Invertebrate Zoology” based on the digitalization of education (on the example of pedagogical higher educational institutions);
- improve the model and criteria for assessing the professional competence of future biology teachers in the context of digitalization and develop a mechanism for its implementation;
- to experimentally substantiate the effectiveness of teaching the course “Invertebrate Zoology” in the context of digitalization, which improves the quality of education.

At the same time, the object of our study is the process of improving the teaching methods for the course “Invertebrate Zoology” based on the digitalization of education.

The subject of the study is the forms, methods and means of increasing the effectiveness of improving the teaching methods of the course “Invertebrate Zoology” based on the digitalization of education.

For the effectiveness of solving the set goals and objectives, we used the following research methods: observation of the activities of teachers in the process of using digitalized teaching aids and methods in the classroom; questioning; methods of pedagogical measurements and diagnostics



corresponding to the objectives of the study (testing); pedagogical experiment, methods of statistical processing of information.

The study of scientific literature [14,15], conducting experimental research with students of pedagogical universities, and implementing an experimental program in work with students 1 and 2 - courses in the biological direction of pedagogical universities, including the study of such topics as the psychological, pedagogical and methodological foundations of teaching experimental course in invertebrate zoology; modern methods of teaching the subject “Invertebrate Zoology”, based on creative competence; the concept of competence and professional competence of future biology teachers; current state of digitalization of education; forms, methods, means and technologies of education in the context of teaching the course of invertebrate zoology, etc., made it possible to achieve the following results:

1. Psychological-pedagogical and scientific-methodological foundations for teaching the course “Invertebrate Zoology” based on the digitalization of education have been developed.
2. A model has been developed for increasing the professional competence of future biology teachers in the context of digitalization from the moment of order, goals, objectives, forms, methods, innovative technologies and information technologies, as it is carried out in the process of theoretical, practical and independent forms of education.
3. A methodology has been developed to improve the professional competence of future biology teachers in the context of digitalization.
4. A package of documents has been developed using information and communication technologies (Training and methodology complex, multimedia, digitalization of all documentation).

Summarizing the above, it should be noted that as a result of the experimental study, the formation of the professional competence of zoology teachers was achieved, which turned out to be more pronounced in the experimental group compared to the control group, as evidenced by a more pronounced increase in such criteria for the professional competence of teachers as cognitive, motivational, creative, activity-oriented, personality-oriented.

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