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INTRODUCTION OF INNOVATIONS IN TEACHING WEB TECHNOLOGIES

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Annotation: Based on an analysis of the training of future computer science teachers in web programming, proposals were made to introduce current topics into the content using innovative teaching methods.
Key words:digital economy, web programming, future computer science teachers, innovative teaching methods.

Introduction:A characteristic feature of the modern world is the digitalization of all spheres of human activity. This process affected literally all aspects: from the arrangement of a person's personal household sphere, accompanying financial transactions, social issues and ending with government activities. Digitalization is an integral component in the development of the country and improving the quality of life.

In Uzbekistan, the development of the Digital Economy is one of the priority areas of state economic policy. Proof of this statement are the adopted laws, as well as the Resolutions and Decrees of the President of the Republic of Uzbekistan Sh.M. Mirziyoyev:

Law of the Republic of Uzbekistan "On Electronic Government" dated December 9, 2015;

Resolution of the President of the Republic of Uzbekistan dated July 3, 2018 No. PP-3832 "On measures to develop the digital economy and the sphere of circulation of crypto-assets in the Republic of Uzbekistan";

Resolution of the President of the Republic of Uzbekistan dated April 28, 2020 No. PP-4699 "On measures for the widespread introduction of the digital economy and e-government";

Decree of the President of the Republic of Uzbekistan dated October 5, 2020 No. UP-6079 "On approval of the Digital Uzbekistan-2030 strategy and measures for its effective implementation."

The digital economy, operating on information technology platforms, is developing at an intense speed, which necessitates the creation of new models and technologies for such platforms. These are digital economy technologies such as Big Data technologies; Internet of Things technology (IoT - Internet of Thoughts); mobile technologies; cloud computing; virtual reality (VR – virtual reality) and augmented reality (AR – augmental reality) technologies; neurotechnology and artificial intelligence (AI); digital platforms; quantum technologies; robotics; blockchain and cryptocurrency technologies; crowdsourcing and crowdfunding.

For the effective development of the digital economy, competitive personnel in the field of IT technologies are needed, and in particular, those well versed in web programming. In the modern information society, web programming is becoming an integral part of education in the field of information technology. This dynamically developing segment requires the younger generation to have a deep understanding of the theoretical aspects associated with creating web

www.wordlyknowledge.uz Volume: 2, Issue: 2, 2023

applications. Therefore, teaching students web programming using innovative teaching methods is relevant.

Literature analysis: In foreign and domestic science, great attention is paid to methods of teaching students web programming.

Karakozov S.D., Khudzhina M.V. studied the issues of improving the training of IT specialists in the context of digitalization of the economy. Based on an analysis of the state of the modern labor market in the IT industry and the projected demand for professional competencies of university graduates on the part of regional employers, the relevance of choosing as a priority approach when teaching programming to future IT specialists an approach based on extensive training in modern programming technologies, among which a special place is occupied technologies in the field of web programming.

The existing approaches to organizing programming training in educational organizations that implement professional educational programs in IT areas of training are considered, and a conclusion is drawn about building training based on the recommendations of international standards in the training of IT specialists in the vocational education system, taking into account the requirements of professional standards, regional employers and the specifics of the university .[3]

Gubasheva Kh.A., Magamedova D.M., Magazieva Z.A. point out that one of the major challenges in preparing qualified IT professionals in higher education is that almost every week new technologies are created that are worthy of placement in a pre-planned semester course. Thus, it becomes obvious that the rapid development of information technology requires the introduction of innovative approaches to the methods of teaching students information disciplines. This is especially true for teaching programming languages to students in universities [1].

M.S. Mozharov explores the problem of improving the methodology of teaching programming at universities and schools. The need for new methods and forms of teaching related to teamwork of students, multimedia content, virtual spaces, etc. is substantiated [6].

Domestic science is also conducting research on the introduction of new technologies in teaching the basics of IT, and in particular programming. So, Botirov M.M. a methodology for developing the professional competence of future teachers in object-oriented programming in a digital technology environment was studied.

Khudaiberdiev Sh.K. worked on the development of professional training of future teachers based on cluster programming training. Sharipova Sh.H. conducted a study to improve the theoretical and practical foundations of the use of innovative technologies in higher educational institutions. Otahonov N.A. studied issues related to the methodology of teaching domain-specific programming languages based on modern technologies.

Research by Abdukarimov S.S. dedicated to improving methodological support for teaching programming languages in an e-learning environment. Khudaiberdiev Sh.K. studied methods of teaching programming languages in a visualized cluster educational environment. Lutfullaev U.M. conducted a study on improving the learning process in higher educational institutions based on virtual resources developed in web applications [4].

Research methodology: In the course of the analysis of regulatory documentation and scientific literature on the topic of research, we put forward a hypothesis that training future computer science teachers in web programming based on innovative teaching methods will not only improve the quality of their teaching, but will also equip them with modern teaching methods, which they will use in the future. will be able to use it effectively in their professional activities.

In the course of the study, we analyzed the training of students of pedagogical universities in the field of Mathematics and Computer Science. The study of regulatory documentation, namely qualification requirements, curricula, standard and training programs

www.wordlyknowledge.uz Volume: 2, Issue: 2, 2023

made it possible to establish that students begin studying web technologies in the 3rd year in the 6th semester within the discipline “Computer Graphics and Visualization”.

The total number of hours allocated for studying web technologies is 120 hours, of which 60 are classroom hours and 60 hours are allocated for independent learning. In turn, classrooms are divided into 20 hours of lectures, practical and laboratory classes.

In terms of content, students are offered to study the basics of HTML (6 hours of lectures, 6 hours of practical and 2 hours of laboratory classes), as well as the basics of CSS (14 hours of lectures, 14 hours of practical and 18 hours of laboratory classes). The hours allocated for independent study are also allocated for HTML - 24 hours, as well as for CSS in the amount of 36 hours.

Observations of the classes led to the conclusion that the lectures are mainly based on providing students with theoretical knowledge in the form of presentations and demonstrations of the actual operation of HTML and CSS tags using the Notepad program. It is recommended to organize practical and laboratory classes using interactive teaching methods, such as quick surveys, case studies, and the use of individual and group projects.

Completing coursework requires students to independently study the capabilities of Flash technologies, Web Design, Java Script, PHP, MySQL.

A study of scientific literature on web technologies showed that very dynamic development is observed in this area. If recently there were such concepts as Web 1.0, Web 2.0, Web 3.0, the new HTML5 language standard [5,7,8], then today it is impossible to leave aside modern trends in this area: PWA -Progressive Web Apps, PHP7, SSL HTTPS protocols artificial intelligence technologies and bots, augmented reality (WebAR), voice search technologies, content personalization using machine learning, accelerated mobile pages (AMP), WebAssembly or Wasm technologies, React web development technology, motion interface, Internet of Things technologies IoT [10].

If we focus on teaching methods, today there is a huge range of innovative approaches to organizing and conducting classes. These include the following [2,9]:

- use of virtual reality technology;
- use of artificial intelligence;
- design thinking process;
- digital class tools;
- Inquiry-based learning and more.

Conclusion: The conducted research allowed us to conclude that the training of web technologies for future computer science teachers needs to be improved on the basis of new approaches to both content and teaching methods. This will equip graduates not only with relevant and in-demand knowledge on web technologies, but will also equip them with modern methods of teaching their future students.

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