CREATING AN ELECTRONIC ENVIRONMENT TO TEACH STUDENTS ON WEB PROGRAMMING

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ABSTRACT

The widespread use and institutionalization of e-learning have necessitated the development of competencies in all participants in the educational process related to the use and development of electronic educational resources, including massive open online courses. The platform for implementing modern e-learning has determined and massive open online courses are cross-browser web resources, and this makes it relevant to develop a methodology for teaching resource development on and for a web platform. This article is devoted to the creation of an electronic environment for teaching students web programming.

In the ever-evolving landscape of education, the integration of technology has become a major focus of the learning process. As the demand for skilled web developers continues to grow, the need for innovative and effective training methods becomes increasingly important. Creating and using an electronic environment to teach students web programming has the potential to revolutionize the way we approach this important area of education. In this article, we provide information about the web programming framework and learning environment that our youth are learning. The main objective of developing such an e-environment is to provide a comprehensive and interactive platform to help students acquire web programming skills. This environment should be designed to meet the diverse learning styles and needs of students, offering a seamless and engaging experience that helps them understand and master web development concepts.

The purpose of the electronic environment is to help students learn to program in a web language. Today's students are at a disadvantage with other students taking this class, with many aspects of visual learning missing from the traditional classroom. Concepts in programming can be difficult to grasp. A visual representation and example can mean the difference between a student simply understanding a concept and mastering it. The environment is a web page where students can access the internet at any time. Any updates to the environment can be done quickly with little or no disruption. It's big from a technical point of view. Teachers can refer to the environment and use examples of it in teaching, giving students the full benefit of visual resources. Students can also use the environment as a task reference to see examples of what they are doing when working on programming tasks on their own systems. This is a huge advantage over traditional paper-based worksheets that

most students do not understand. More specifically, this environment should give students a great advantage in learning web programming.

The increasing process of introducing electronic educational resources into the educational process leads to an improvement in the quality of education based on information technology. Today, a teacher has the opportunity to observe, control and guide a student from his place on the monitor. It becomes possible to exchange visual information with a student, copy an image from his monitor to the monitors of students and back, carry out audio communication with a specific student, use a projector that shows an image from a teacher's computer or a student's computer on the board. It becomes necessary to integrate electronic educational resources into the educational process. Below is an example of integrating electronic educational resources into the educational process in a secondary vocational educational organization.

At the first stage of integration, teachers are identified who want to introduce an information-based tool - an electronic educational resource - into their professional activities. It is necessary to identify the level of information culture and readiness of both teachers and students to master this type of technology. If necessary, conduct various classes to improve qualifications.

Second stage. A selection of academic subjects or topics is carried out, and their content, structure, and features are analyzed. If a teacher or a group of authors decides to use electronic resources, then it is necessary to define their didactic goals, content, structure, purpose and determine the types of classes in which a specific resource will be used.

The third stage. Already created and used resources in this area are studied, their advantages and disadvantages are found. When developing a new electronic educational resource, a teacher or a group of authors begins to develop a scenario and technology for teaching in the resource being created, and selects the means of its implementation.

The fourth stage. A preliminary psychological and pedagogical analysis of the expected changes in the effectiveness of training when using ready-made or planned resources is carried out, their impact on the main factors of intensification of the educational process and personal development of students is assessed, problems and difficulties that may arise for both teachers and students when using information and communication technology are predicted.

The fifth stage. When using a ready-made resource, it is directly included in the educational process for control groups of students and information is collected on its use and achieving an increase in the quality and effectiveness of the educational process.

The sixth stage. If the improvement of the quality and efficiency of training with the resource is achieved, then its use becomes widespread in the educational institution. The positive experience of teachers implementing this type of electronic resource should become an impetus for other teachers to use it in their professional activities.

The process of developing electronic educational resources consists of two main stages: the preparatory stage and the layout. At the first stage (preparatory) the following is performed:

- selection of sources and formation of the main content;
- structuring of the material and development of the table of contents or scenario;
- processing of the text and formation of the main sections

- selection, creation and processing of the material for multimedia embodiment (video clips, soundtrack, graphic images).

At the second stage the layout (assembly into a single whole) of all selected and developed parts of electronic educational resources (information, training, control) is performed for presentation to students in accordance with the scenario conceived by the author. In general, the process of developing electronic educational resources is explained by the diagram presented in Figure 1.
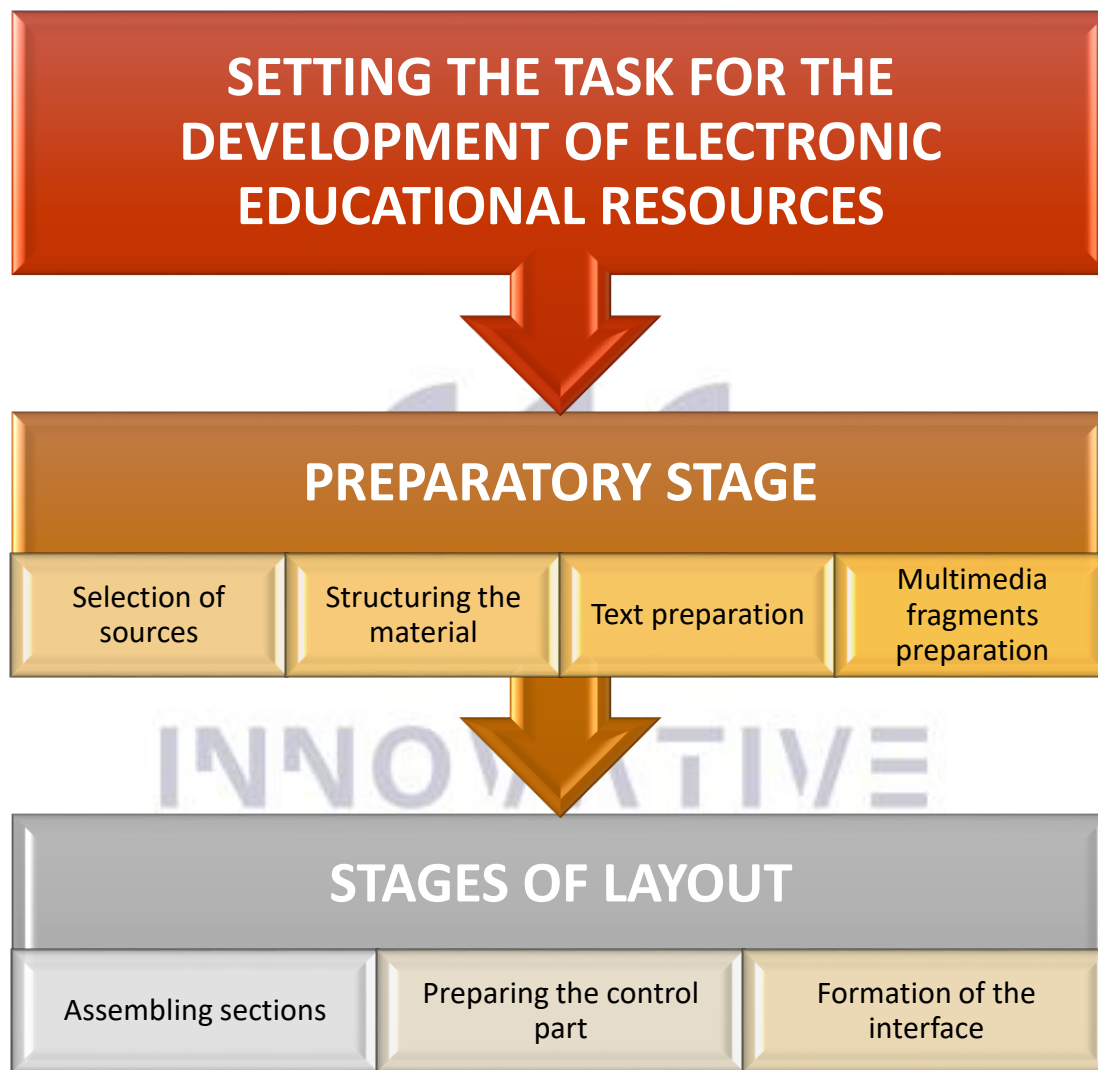
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│         SETTING THE TASK FOR THE                       │
│    DEVELOPMENT OF ELECTRONIC                           │
│         EDUCATIONAL RESOURCES                          │
└──────────────────────────────────────────────────────┘
                          ↓
┌──────────────────────────────────────────────────────┐
│              PREPARATORY STAGE                         │
├──────────────┬──────────────┬──────────────┬──────────┤
│ Selection of │ Structuring  │ Text         │ Multimedia│
│ sources      │ the material │ preparation  │ fragments │
│              │              │              │ preparation│
└──────────────┴──────────────┴──────────────┴──────────┘
                          ↓
┌──────────────────────────────────────────────────────┐
│              STAGES OF LAYOUT                          │
├──────────────────┬───────────────────┬────────────────┤
│ Assembling       │ Preparing the     │ Formation of   │
│ sections         │ control part      │ the interface  │
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Fig. 1. The process of developing electronic educational resources

It is necessary that the content of electronic educational resources correspond to the level of education received. Today, the development of electronic educational resources should be focused on obtaining the competencies specified by the discipline program. At the preparatory stage, the selection or development of source materials for electronic educational resources (texts, graphic illustrations, animation, audio and video fragments, etc.) is carried out, including the development or acquisition, if necessary, of educational application packages. At this stage, general-purpose software is usually used: text and graphic editors, animators, audio / video digitization programs, programming tool environments, etc. In the structure of electronic educational resources, it is customary to distinguish an introduction and a main part, which consists of sections, chapters, topics. The introduction is an important

element of electronic educational resources, it substantiates the relevance of this electronic educational resource and determines the level of education and the audience for which this resource is intended. When forming the content, it is recommended to divide it into two parts: the main part, mandatory for study, and an additional - variable, for in-depth study of the material, broadening horizons, increasing motivation. The following sections are mandatory:
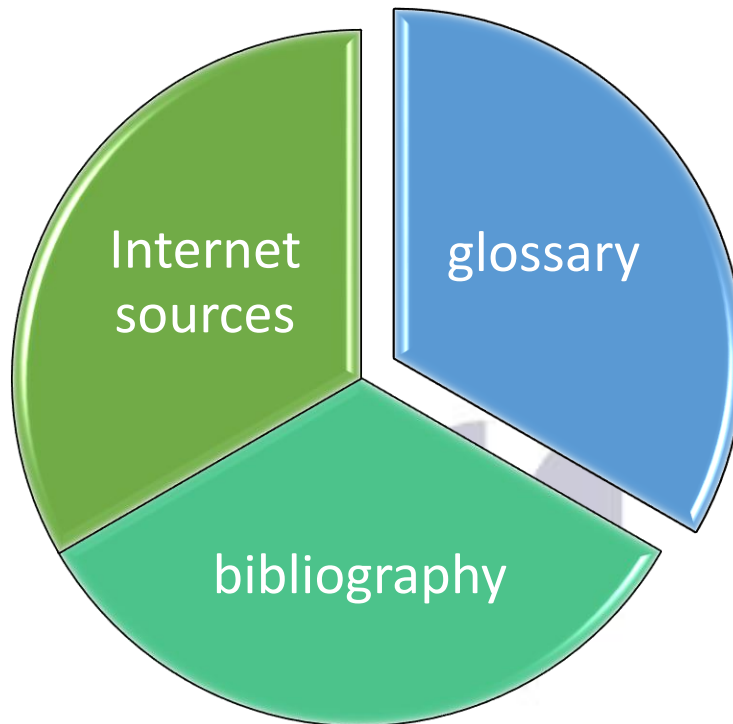
The use of programming allows implementing almost any didactic methods of the author and developers. However, this approach also has significant disadvantages, such as:

- high labor intensity of the process of developing electronic educational resources;
- the need to involve professional programmers;
- the impossibility of making changes without involving programmers;
- significant dependence of the didactic quality of the training scenario on the pedagogical qualifications of the developers.

An alternative way to compose educational material of electronic educational resources is the use of instrumental software packages, which can be divided into two groups - general-purpose or special-purpose software. The first group includes Power Point, Adobe Acrobat and a number of others. However, the capabilities of general-purpose software packages are limited in terms of creating functionally complete electronic educational resources. For example, in Power Point, this is only a presentation of educational material with predominantly linear navigation. Here, there is no possibility of providing arbitrary navigation through the educational material and the ability to prepare interactive exercises for self-monitoring and training. These capabilities are provided, as a rule, in special software tools called authoring systems.

Software tools for creating electronic educational resources are the so-called authoring systems, which are defined as a set of tool programs designed to create and operate electronic educational resources. In Uzbekistan, the term "Tool shell" or simply shell for creating

electronic educational resources is also in use. Methodological materials should be developed with an eye to their universal use: via the Internet, in local networks, on individual computers of students, and in remote educational and consulting centers and branches.

Advantages of using an electronic medium. Reduced study time-studies have shown that study time can be reduced with electronic tools because the student controls the pace of learning and has the ability to quickly go back and review previous lessons. Static web content that supports the programming environment far surpasses textbook learning in terms of functionality and efficiency, but it is still limited in terms of interactivity and feedback. The ideal web programming learning tool provides a customized learning path for students, where the tool gradually adapts to the student's understanding of the material and provides hints and feedback on assignments. Although this opens up a very difficult area of creating intelligent tutoring systems.

Simplify Complex Concepts - Web programming is filled with abstract concepts that can be difficult to teach effectively using simple words and paper. By using animated graphics and interactive demonstrations, the teacher can effectively demonstrate many abstract concepts. JavaScript can simulate the 'transformation' of variables or objects; it can move objects and create animated effects and transitions. This is a great improvement over the traditional static representation of complex concepts on paper. The Internet has improved the way we learn and interact with the world. As a result, web programming has become an increasingly important skill for students in all disciplines. The web programming environment provides a platform for students to develop their technical skills, explore their creativity and contribute to the global online community.

Advanced learning and problem-solving skills. The web programming environment provides students with a unique opportunity to learn by doing. Through hands-on experience, students can deepen their understanding of complex concepts and develop problem-solving skills. The interactive nature of web development allows students to experiment with different approaches, get immediate feedback, and learn from their mistakes. This active learning process develops critical thinking, analytical skills and the ability to adapt to new challenges. In addition, web-based programming environments often provide access to many learning resources, including tutorials, documentation, and online communities. Students can use these resources to supplement classroom learning, delve deeper into specific topics, and connect with other students and professionals. This collaborative learning environment fosters knowledge sharing, peer support and a sense of community.

Improved career prospects and employability. The demand for skilled web developers is constantly increasing, making web programming a highly sought-after skill in the job market. Students who develop web programming skills are well positioned to secure internships, entry-level positions, and even freelance opportunities in the technology industry. In addition, web programming skills are increasingly valued in fields as diverse as marketing, education, and healthcare. This universality allows students to create different career paths and increase their overall employability. In addition, the web development environment gives students the opportunity to create a portfolio of their work, demonstrating their skills and creativity to potential employers. This clear evidence of their abilities can be an important advantage in the competitive job market. Development of creativity and innovation. A web-based programming environment allows students to express their

creativity and bring their ideas to life. The open nature of web development allows students to explore different design options, experiment with new technologies, and create unique and innovative online experiences. It creates a sense of ownership and achievement, encouraging students to push their limits and develop their potential. A web development environment encourages collaboration and teamwork. Students can work together on projects, share ideas and learn from each other's strengths. This collaborative approach fosters a sense of community and facilitates the exchange of knowledge and skills.

At the heart of this electronic environment is a well-designed curriculum that covers the fundamentals of web programming. This curriculum should cover a wide range of topics, including HTML, CSS, JavaScript, server-side technologies, and web frameworks. By structuring content in a logical and progressive manner, students can build a solid foundation and gradually progress to more advanced concepts, ensuring a smooth and consistent learning journey. The electronic environment should include a variety of interactive learning tools and resources to enhance the student experience. This can include interactive coding exercises, video tutorials, virtual simulations, and real-time feedback mechanisms. These elements not only engage students, but also give them the opportunity to apply their knowledge in a practical way, strengthening their understanding and problem-solving skills. In addition, the electronic environment should foster a collaborative and supportive learning community. This can be achieved through features such as discussion forums, peer feedback and virtual study groups. By encouraging students to interact with their peers and teachers, electronic environments can foster a sense of camaraderie and shared learning, resulting in a more enriching and fulfilling educational experience.

In order to ensure the continued relevance and effectiveness of the electronic environment, it is essential to implement a robust system of continuous evaluation and improvement. This may include the collection of regular student reports, monitoring their progress and performance, and the understanding of the platform's ongoing development and improvement. By adapting to the evolving needs and preferences of students, the online environment can adapt and evolve, ensuring that it remains the most up-to-date and valuable resource for web programming education. Thus, the development of an electronic environment in which students are taught web programming has enormous potential to revolutionize our approach to this important area of education. By providing a comprehensive, interactive and collaborative learning experience, this environment enables students to acquire the skills and knowledge necessary to thrive in the dynamic world of web development. As we continue to navigate the digital landscape, the successful implementation of such an electronic environment can play a critical role in shaping the future of web programming education and ultimately the next generation of skilled web developers.

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