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FORMS OF USING ELECTRONIC EDUCATIONAL RESOURCES IN TEACHING THE SUBJECT "NETWORK TECHNOLOGIES"

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Abstract; This article explores the effective forms of using electronic educational resources in teaching the subject "Network Technologies", the significance of electronic learning tools in the educational process, the selection and integration of their types, and methods for delivering subject content in an interactive and user-friendly manner using modern technologies. It also highlights the possibilities of distance learning, multimedia resources, virtual laboratories, and electronic platforms.

Keywords: E-learning, electronic educational resources, network technologies, interactive learning software, digital libraries.

The main goal of using electronic educational resources, particularly electronic teaching and methodological complexes, is to ensure visuality in the learning process and to create opportunities for independent learning for students, while also supporting teachers. For example, the teaching section allows instructors to organize their lessons effectively with students. By using control tools, the teacher can develop various formats for face-to-face assessments. Another important aspect for instructors is access to complete information about each student, including tasks that pose difficulties. Electronic learning resources enable the automation of selecting the most challenging tasks during the learning process.

In using electronic educational resources in teaching "Network Technologies", resources may be stored on cloud services or physical media such as CDs, DVDs, and flash drives, or be available online in the form of websites. These can exist in both open and closed formats.

Open-access electronic learning resources refer to those which are accessible freely and allow users to study any topic of their interest within the "Network Technologies" subject. This means learners, enthusiasts, and professionals can choose and engage with topics at their discretion.

Closed-access electronic learning resources, on the other hand, follow a structured and sequential format where users must study topics in a specific order. Only after mastering one topic can they move on to the next, which ensures a systematic learning process.

Creating and using electronic educational resources in the "Network Technologies" subject requires both hardware and software infrastructure. The hardware includes computers, projectors, multimedia equipment, and additional devices. The software tools can be categorized into four major groups, as proposed by some researchers:

1. Text and HTML editors: Notepad, AkelPad, HTML Reader, FrontPage, Macromedia Dreamweaver, HomeSite, WebStudio, Web Page Maker, Sothing DHTML Menu, PHP Designer, Web Builder;
2. Graphic editors: Adobe Photoshop, CorelDraw, Adobe Illustrator, AutoCAD, Ulead PhotoImpact;
3. Animation and multimedia editors: Adobe Flash, 3DS Max, GIF Animator, XARA 3D, Alias MAYA, Ulead VideoStudio, Pinnacle Studio, Video EditMagic, Sound Forge, Adobe Premiere Pro;
4. Specialized software: Microsoft Access, MySQL, Oracle, Visual Basic, Borland Delphi.

Additional requirements for developing electronic learning resources include:

- Unified software, management approach, and design;
- Tools for collaborative group work and discussions;
- Openness for expanding and modifying educational materials based on pedagogical application outcomes.

Using electronic educational resources introduces students to modern technologies and helps reinforce their knowledge, making the teaching process of network technologies more effective and interactive.

Types of electronic learning resources include:

- Didactic materials: Presentations (PowerPoint, Prezi), electronic lecture notes (Word, PDF), concept maps (mind maps), interactive diagrams (Lucidchart, Canva).
- Electronic tests and quizzes: Auto-graded tests (multiple choice, drag & drop), real-world networking problem sets, timed assessments.
- Simulations: Cisco Packet Tracer (network building in simulated environments), GNS3 (real device-based practice), NetAcad – Cisco's official simulator.

The use of electronic educational resources in teaching "Network Technologies" has become an integral part of the modern educational process. Since this subject is directly related to information and communication technologies, teaching through electronic means significantly enhances its effectiveness.

The rapid development of modern ICTs greatly impacts the educational process. Especially for IT-related disciplines like network technologies, using electronic educational resources improves learning efficiency, strengthens practical skills, and increases student engagement. Electronic textbooks enriched with text, graphics, animations, and audio-video content help convey complex technological concepts in a more understandable and visual manner. For instance, explaining topics such as IP addressing, subnetting, or routing using videos and animations improves comprehension.

Practical training in network technologies usually requires real hardware, which may not be feasible for all educational institutions due to financial or technical constraints. In such cases, software tools like Cisco Packet Tracer and GNS3 become highly valuable, allowing students to virtually configure routers, switches, and other networking devices—effectively developing practical skills.

Modern learning platforms like Coursera, Udemy, Khan Academy, and Cisco Networking Academy offer online courses taught by top universities and professionals. Students can select courses suitable for their knowledge level and study independently.

Furthermore, video conferencing tools such as Zoom, Microsoft Teams, and Google Meet allow remote classroom sessions, a necessity that proved crucial during the pandemic.

Electronic assessments enable regular monitoring of students' progress, allowing quick and accurate evaluation. With tools like Moodle, Quizizz, and Google Forms, instructors can create a variety of tests, assignments, and quizzes that are auto-graded and offer analytical insights—saving time and ensuring transparency in assessment. Incorporating game elements (gamification) such as awarding badges like "Module Completed" or "Top Performer" can foster healthy competition, boost student motivation, and make learning more engaging.

Using electronic learning resources in teaching network technologies not only modernizes the learning process but also develops students' independent learning skills and helps shape their professional competencies. Integrating digital technologies into education is a necessity today, especially in training qualified specialists in the field of information technology. Proper use of ICT in the educational environment raises teaching to a new level, increases student motivation, improves content visualization, and allows learners to acquire knowledge independently.

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