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METHODOLOGICAL PRINCIPLES OF CREATING AND USING DIGITAL INFORMATION RESOURCES ON THE DROPBOX PLATFORM

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Abstract. One of the contemporary trends in education is the integration of digital technologies into the educational system. The digitalization of the educational process is not limited to the mere use of information technologies. In both online and offline learning conducted via the Internet, mobile applications, and various platforms, it is crucial to ensure the teacher's adaptability, individualization of learning, and enhancement of its creative aspects. This article analyzes the role of cloud technologies in shaping the digital educational environment and highlights the methodological principles of creating digital information resources on the Dropbox platform. In particular, the study scientifically substantiates the stages of instructional material design, structural organization of files, mechanisms for collaborative work, security requirements, and factors contributing to pedagogical effectiveness.

Keywords: cloud technologies, digital education, educational platform, Dropbox platform, pedagogical opportunities, digital information resources, methods for creating digital information resources, collaborative technologies

Introduction. Effective utilization of Internet resources is essential for the digitalization of education. Digital technologies represent the Internet-based resources integrated into the educational process. The contemporary era is characterized by the widespread dissemination and use of digital resources [2].

Digital educational resources serve as a promising means to ensure an effective information-rich learning environment. Modern educators must not only keep pace with technological developments but also possess the skills to use digital technologies and work effectively with students who are proficient in the digital world.

The role of digital technologies in the development of contemporary education is increasingly significant. Extensive use of Internet resources, implementation of interactive teaching methods, and integration of digital platforms into the learning process have a demonstrable positive impact. Interactive materials offered by digital technologies play a crucial role in enhancing student engagement and improving the quality of the knowledge they acquire.

Current educational realities demand the use of modern digital technologies. Numerous platforms and applications have been developed to improve the quality of the educational process. Consequently, digitalization is fundamentally transforming the methods of creating, storing, and sharing learning materials in the education system.

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Cloud-based platforms provide teachers and students with rapid access to information from any location. In this context, the Dropbox platform offers essential functionalities in the educational process, including:

- storing and synchronizing files,
- organizing collaborative work,
- maintaining version histories,
- ensuring secure sharing of information.

Dropbox has been recognized as an effective tool for enriching the educational process and implementing interactive teaching methods. It enables teachers to make their lessons not only interactive but also engaging and productive. Students, in turn, can use the platform to access learning materials, develop independent thinking, and enhance practical skills.

For educators, Dropbox provides opportunities to create various interactive digital educational resources. Using this platform, teachers can design interactive materials such as tests, crosswords, adaptation games, diagrams, and tables. Utilizing Dropbox not only increases the interactivity of lessons but also strengthens student motivation and improves the level of knowledge acquisition [1].

This study analyzes the effectiveness of using the Dropbox platform and its application in teaching Information Technologies. The article examines the creation of interactive digital learning resources, enhancement of student engagement, and promotion of independent thinking. The purpose of this research is to assess the efficiency of the Dropbox platform in the educational process and to draw conclusions regarding its role in teaching.

Main Part. Cloud technologies refer to systems that allow the storage and management of data on remote servers via the Internet. In education, cloud services enable:

- distance learning,
- storage of digital resources,
- collaborative work,
- online assessment capabilities.

Dropbox is a cloud-based storage and file-sharing service that provides the following functionalities:

- storing files in the cloud,
- sharing via links,
- collaborative work,
- maintaining version history,
- data backup.

The main advantages of Dropbox in the educational system include:

- centralized management of learning materials,
- rapid exchange of information between teachers and students,

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- cross-platform flexibility,
- high level of security.

The Dropbox platform offers the following pedagogical opportunities:

- **Flexibility:** The platform supports various formats, including PDF, DOCX, PPTX, video, audio, and interactive files.
- **Synchronization:** Automatic synchronization is performed between computers, tablets, and mobile devices.
- **Collaborative environment:** Multiple users can simultaneously work on a single file.
- **Version control:** Previous edits can be restored, which is crucial when working with academic and instructional documents.

The Dropbox cloud service is organized through the website https://www.dropbox.com. The process of setting up the system and uploading data follows the sequence below:

1. **Registration:** Users register through the web interface to access the system (Figure 1).

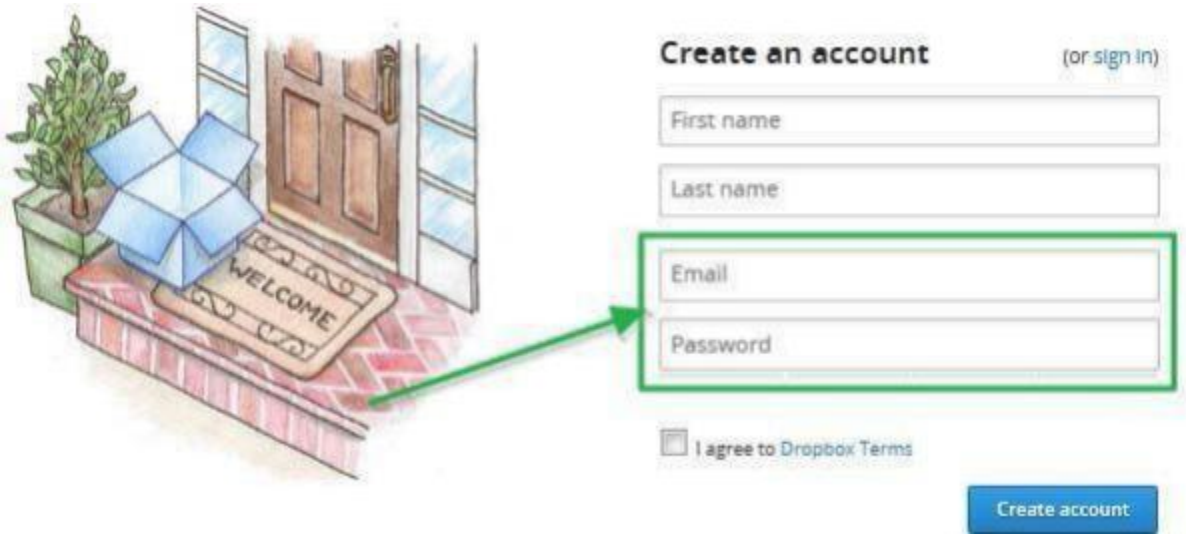


Figure 1. Registration in Dropbox Cloud Technology

2. **Working in the Dropbox Web Interface.** After completing the registration, the following window appears on the website.

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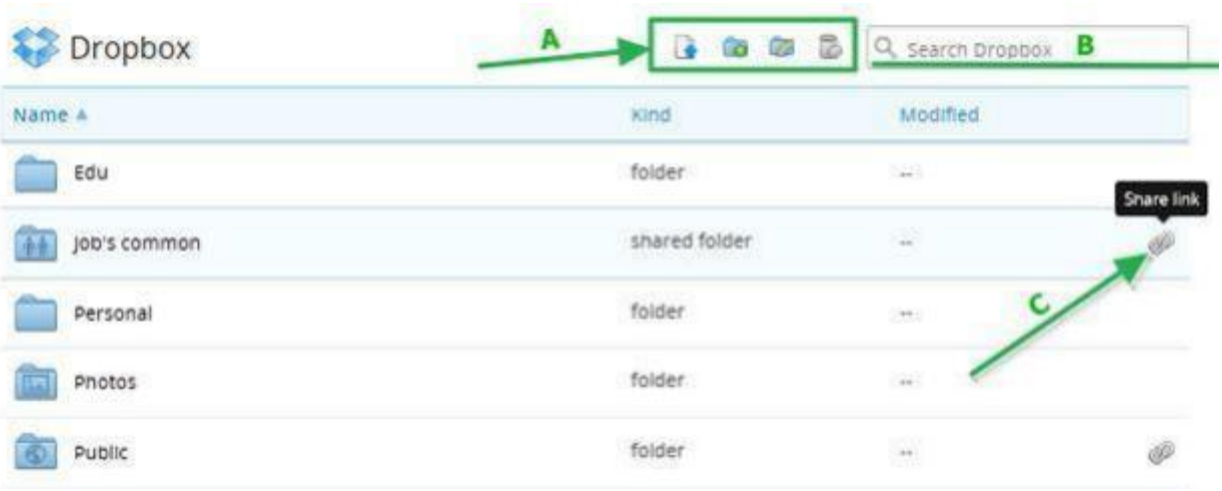


Figure 2. Web Interface of the Dropbox Service

Through this interface, users can:

- create new folders,
- upload new files,
- create or add new directories,
- organize shared access,
- edit and delete files.

The Dropbox platform is a cloud service that enables the efficient creation, storage, and sharing of digital information resources within a modern educational environment. Its didactic potential is manifested in the following areas:

1. **Organization of the educational process:** Dropbox allows for centralized storage and systematic arrangement of learning materials. Instructors can organize lecture notes, presentations, laboratory works, test assignments, and multimedia files into separate folders according to a logical structure, ensuring order and continuity in the learning process.
2. **Support for distance and blended learning:** The platform provides access from any location via the Internet. This functionality is crucial for organizing distance learning, blended learning, and independent study effectively. Students can download course materials, submit assignments, and collaborate online with instructors.
3. **Collaborative learning:** Multiple users can work simultaneously on a single project through shared folders on Dropbox. Features such as commenting, file editing, and tracking updates facilitate the implementation of collaborative learning methods, enhancing students' communication competencies.
4. **Version control and reflection:** The ability to maintain previous versions of files allows errors to be corrected, progress to be analyzed, and reflective practices to be implemented. This fosters students' self-monitoring skills.
5. **Support for individualized learning:** The platform allows materials to be tailored for students with different levels of knowledge. For example, additional assignments, advanced exercises, or simplified explanations can be provided, enabling differentiated instruction.

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6. **Information security and control:** Access rights management (view/edit), password-protected links, and two-factor authentication ensure the security of educational data, which is especially important for gradebooks, research work, and copyrighted materials.

The creation of digital information resources on the Dropbox platform should be organized methodically and sequentially. The main stages of this process are as follows:

1. **Defining goals and objectives:** Prior to creating digital resources, the following must be determined:

- learning objectives (knowledge, skills, competencies),
- student level,
- subject and topic characteristics,
- expected outcomes.

This stage serves as the foundation for pedagogical design.

2. **Planning and designing content:** The content structure is developed, including:

- lecture texts,
- presentations,
- video lessons,
- practical assignments,
- test questions,
- supplementary literature.

Materials are designed according to didactic principles such as systematization, consistency, and clarity.

3. **Conversion to digital format:** Prepared materials are saved in appropriate formats:

- PDF (theoretical materials),
- PPTX (presentations),
- MP4 (video lessons),
- DOCX or Google Docs files,
- interactive test files.

File names are standardized (e.g., 01-Topic_Name.pdf) to facilitate searchability.

4. **Structural organization:** A folder hierarchy is created in Dropbox, for example:

```
Subject_Name/
├── Lectures/
├── Practical_Work/
├── Independent_Study/
├── Tests/
└── Multimedia/
```

This structure ensures the logical sequence of the learning process and simplifies navigation.

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5. **Sharing and collaboration:**

- Access rights are set (view/edit),
- group folders are created,
- sharing with students via links is performed,
- commenting and editing features are activated.

This stage supports interactive teaching methods.

6. **Monitoring and updating:**

- File versions are tracked,
- student feedback is analyzed,
- materials are updated as necessary,
- outdated resources are archived.

This process ensures the relevance and currency of educational resources.

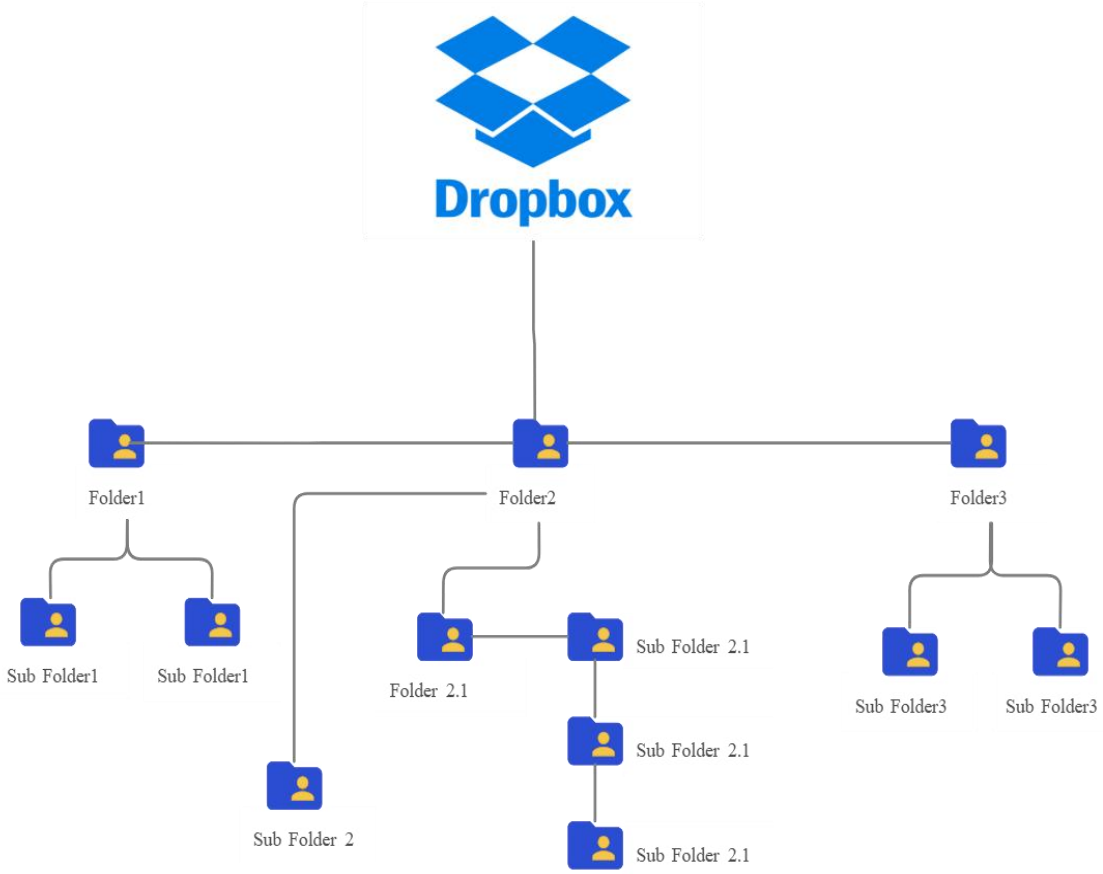


Figure 3. Diagram of Digital Information Resource Storage

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Digital information resources created on the Dropbox platform should adhere to the following principles:

- **Systematic organization:** Materials should be arranged in a logical sequence.
- **Interactivity:** Students should be able to provide feedback, write comments, and submit assignments.
- **Visualization:** The use of graphics, tables, videos, and diagrams enhances learning effectiveness.
- **Individualized approach:** The platform allows for the placement of supplementary materials tailored to students of varying levels.

The effectiveness of using digital resources can be assessed based on the following criteria:

- student engagement,
- indicators of independent work,
- knowledge acquisition levels,
- time efficiency,
- speed of feedback.

The use of cloud platforms optimizes the learning process and enhances the effectiveness of distance education. The creation of digital information resources on the Dropbox platform represents an important direction in the modernization of the educational process. Methodically organized resources enable:

- systematic storage of learning materials,
- facilitation of collaborative work,
- rapid information exchange,
- improvement of pedagogical effectiveness.

Therefore, the use of the Dropbox platform in the educational system should be considered an integral component of digital transformation.

Discussion. The Dropbox platform stands out as an effective tool for creating interactive digital learning resources and enhancing student engagement in the teaching process. Through this platform, instructors can make their lessons more engaging and interactive, which contributes to a more interesting and effective learning experience for students. Research results indicate that the use of the platform not only improves students' knowledge but also significantly enhances their level of comprehension.

The platform also plays a critical role in developing students' independent thinking and analytical skills. For example, crosswords and tests created on Dropbox encourage students to think critically, thereby fostering essential reasoning and analytical abilities. Research results show that students in the experimental group demonstrated better performance in solving problems independently, highlighting the platform's effectiveness in supporting self-directed learning [2].

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Dropbox is also beneficial for developing practical skills. Digital learning resources designed to teach tasks such as working with diagrams and tables in computer science prepare students for real-life applications. This approach enables students to apply theoretical knowledge to practical tasks, thereby reinforcing their learning.

However, there are some limitations to using Dropbox. Since the platform relies on an Internet connection, it may be difficult to conduct lessons effectively in areas with poor connectivity. Additionally, some instructors and students may not fully utilize the platform's features and templates. To address this issue, training sessions and guidelines for instructors are necessary [3].

The future potential of the Dropbox platform is substantial. The platform can expand the range of interactive digital learning resources, including the completion of forms, editing of diagrams, and many other practical educational applications. Moreover, it can be adapted to national curricula, with specialized templates developed for each subject, further enabling the organization of a more effective and individualized educational process.

Result. The study produced several findings regarding the effectiveness of the Dropbox platform in the educational process and the impact of interactive digital learning resources on students' knowledge levels. Active use of the platform in the experimental group had a positive effect on students' academic performance. The results indicated a significant improvement in both student engagement and knowledge acquisition.

A clear difference was observed when comparing the knowledge levels of the experimental and control groups. In the experimental group, students reinforced their understanding through the creation and use of interactive digital learning resources on the Dropbox platform. In contrast, students in the control group received instruction through traditional methods, and their knowledge levels were considerably lower.

As indicated by the study, students in the experimental group achieved 20–25% higher scores compared to their initial assessments, confirming the effectiveness of the Dropbox platform in the educational process. These results demonstrate that interactive and innovative approaches, which actively engage students, enhance their learning outcomes.

Tests and crosswords created via the Dropbox platform proved highly beneficial for students. Crosswords, in particular, played a crucial role in mastering computer science terminology. Through these digital learning resources, students not only acquired new knowledge but also developed memory retention and analytical skills.

Furthermore, interactive resources involving diagrams and tables were also effective. These tools helped students comprehend complex information more easily and develop analytical skills.

Students in the experimental group demonstrated greater use of independent thinking and analytical approaches. While completing interactive digital learning resources on Dropbox, students were required to critically analyze each question or problem, fostering independent thinking skills. As a result, experimental group students performed significantly better in solving tasks independently.

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Visual materials created on Dropbox, including diagrams, tables, and other graphics, made the learning process clearer and more effective. With these visual aids, students understood topics more accurately and achieved better knowledge retention, thereby enhancing overall lesson effectiveness.

Analysis of students' activities indicated a high level of learning efficiency when using the Dropbox platform. Experimental group students demonstrated a clearer understanding of the materials while performing interactive tasks. Their engagement increased significantly, and they were more willing to participate actively in lessons, highlighting the platform's role in enhancing educational interaction.

Conculision: The use of the Dropbox platform has a significant impact on improving students' knowledge, engagement, and independent thinking skills in the teaching of computer science. Research results demonstrate that interactive digital learning resources help students consolidate their knowledge, develop analytical thinking, and acquire practical skills.

Experiments in the experimental group revealed that Dropbox not only made learning more engaging and effective for students but also enabled instructors to conduct interactive and high-quality lessons. Such innovative educational resources encouraged independent work, facilitated deeper knowledge acquisition, and supported skill development. Features of the platform, including an intuitive interface, numerous ready-made templates, and diverse interactive tools, further simplified learning for students.

However, considering the platform's dependence on Internet connectivity, certain technical limitations, and issues in the mobile version, it is recommended that instructors supplement lessons with additional resources during preparation.

Future research should explore expanding Dropbox's capabilities and adapting it to various subjects and national curricula. This will contribute to the creation of more effective and versatile educational tools for both students and instructors.

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