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PEDAGOGICAL POTENTIAL OF INTERACTIVE PLATFORMS IN A DIGITAL LEARNING ENVIRONMENT

Nosirova Dilnoza Toir qizi
Lecturer, Jizzakh State Pedagogical University

(dilnoza.n92@gmail.com)

Abstract

This article explores the theoretical foundations for the effective utilization of digital educational resources and software tools within the modern education system. Throughout the research, the pedagogical potential of various educational platforms—specifically **VAcademia**, **LearningApps**, **Google Classroom**, and **Kahoot!**—alongside cloud services and educational YouTube channels, is analyzed in the context of their role in the instructional process. The analysis demonstrates that interactive platforms facilitate the enhancement of educators' ICT competence, stimulate students' autonomous learning activities, and provide mechanisms for the objective monitoring of educational quality. Furthermore, the article addresses the individualization of the learning process by integrating artificial intelligence algorithms into testing and diagnostic systems.

Keywords: Digital educational resources, educational platform, gamification, virtual classroom, YouTube educational channels, interactive methods, independent education.

Introduction

Today, an educational platform encompasses a comprehensive suite of interactive online services designed for educators, parents, and students. These systems serve not only as mechanisms for information delivery but also as vital tools for supporting and managing the quality of education. The integration of digital resources introduces fundamentally new pedagogical approaches to the instructional process, streamlining curricula and enabling the systematic monitoring of student creativity through electronic portfolios (e-portfolios).

The terms "Educational Platform," "Educational Portal," and "Online Learning Platform" refer to an interactive online service ecosystem that provides a collection of resources, tools, and information to support and manage educational excellence. It is a comprehensive, simplified, and intuitive system that facilitates learning via the Internet. Standard educational platform tools include software designed to support the following:

- Creating educational content;
- Delivering, utilizing, and enhancing content;
- Searching for necessary information;
- Content and learning management;
- Establishing communities for organizing remote and blended learning;
- Reporting and analyzing the progress of the educational process.

Many portals also provide opportunities for experience exchange with colleagues through blog posts or article formats.

The educational content hosted on the platform includes ready-made courses or specific modules designed for use during lessons or independent study. For example, a mathematics course may feature a collection of texts, infographics, tests, assignments, crosswords, videos, images, and graphics, alongside attendance and performance logs.

Communication among participants in the educational process is facilitated through electronic mail, instant messaging, discussion forums, announcement boards, and blogging.

Educational management is maintained by systems that record and monitor student progress, particularly through assessment testing. Furthermore, instructors can aggregate data regarding student profiles, attendance, schedules, and electronic portfolios.

Educational platforms, portals, and websites offer the following capabilities:

- Developing fundamentally new pedagogical approaches to the organization of the educational process;
- Simplifying the process of developing and adapting pedagogical software (through access to existing knowledge bases on the platform, electronic educational resources via links to educational portals and websites, as well as integrated instrumental systems);
- Utilizing testing and diagnostic systems that include a bank of questions, tasks, and exercises for the subjects taught, with the ability to modify or add new questions and assignments;
- Monitoring the dynamics of student creativity and the professional development of educators through the use of e-portfolios;
- Facilitating document exchange with higher educational management authorities.

Such platforms can be utilized in any educational institution. They consistently provide new opportunities for developing the ICT competencies of teachers, students, and parents.

Currently, various educational platforms, portals, and websites are available:

VAcademia is an educational platform designed for building virtual environments. In this world, the learning classroom resembles a traditional physical classroom; students and teachers participate in lessons as **3D avatars**, making virtual classes feel like real-life experiences. Within the **VAcademia** virtual educational world, various types of lessons can be conducted, including lectures, seminars, practical sessions, role-playing games, and simulations. To this end, various instructional tools are provided for teaching and organizing collaborative learning activities. The primary advantage of VAcademia is its ability to record lessons in a virtual format, thereby creating a new type of digital content for distance learning. **URL:** http://vacademia.com/

LearningApps is a Web 2.0 application designed to support the learning and teaching process through interactive modules. Existing modules can be directly integrated into educational content, and they can also be modified or created online. Instructors can select necessary building blocks and make them publicly accessible. Access to ready-made resources is available even for unregistered users. The tasks are interactive, allowing students to test and reinforce their knowledge in a gamified manner, which helps foster their interest in a specific academic subject.**URL:** https://learningapps.org/

Google Classroom is a feature-rich, comprehensive, and free solution for creating virtual classrooms, distributing assignments and homework, communicating with the audience, and maintaining organizational order both within and outside the classroom. Any user with a Gmail account can utilize this application and the entire suite of Google tools. The system enables the organization of online training within the classroom, where students can engage in Q&A sessions with their teachers and peers. Additionally, teachers can post questions and lesson materials for home study. The system is particularly convenient for organizing **blended learning**.

Edmodo is a service widely utilized across the educational systems of many countries. Edmodo can be used for communication, interaction within virtual classrooms, file sharing, and assessment. The system is integrated with Microsoft Office and Google. The virtual learning space is designed for educators to create digital classrooms, instruct students, and connect them to e-learning resources for knowledge management. **URL:** https://www.edmodo.com/m

Kahoot! is a game- and question-based learning platform. With this tool, students can create surveys, quizzes, discussions, or polls that supplement classroom lessons. The application allows for the creation of presentations and tests, as well as the organization of collaboration and joint activities during lessons. **Kahoot!** promotes game-based learning, which increases student engagement and creates a dynamic, social, and fun learning environment. The service enables teachers to create and apply gamification elements in the classroom to capture student attention. Materials are designed such that students answer questions during a game format. Students can view presentations on a shared screen or use their own smartphones, tablets, or laptops. **URL:** https://getkahoot.com

ReadWriteThink is an online platform that assists educators in aggregating lesson plans, presentations, interactive materials, and various activities in a single location. The application provides a vast array of resources, making it exceptionally easy and convenient for both teachers and students to locate necessary information. Additionally, it offers resources for parents and the teaching community to exchange experiences and insights. **URL:** http://www.readwritethink.org/

Nearpod is a platform designed for creating virtual environments within the classroom. Nearpod features materials based on virtual reality (VR) technology. Pre-recorded virtual field trips allow students to explore any location worldwide. The platform offers numerous capabilities for visualizing and presenting educational content, as well as for student assessment. **URL:** https://nearpod.com/

CoSpaces EDU enables learners and educators to create their own "virtual spaces" or navigate through those developed by other users. Students interact within virtual or augmented reality (VR/AR) environments. CoSpaces EDU is designed for all age groups, subjects, and various devices. The platform's gallery includes examples that facilitate the ease of mastering and implementing the system. It focuses on empowering students to work independently while fostering creativity, new ideas, and innovation. **URL:** https://cospaces.io/edu/

ClassDojo is an application designed for communication within the classroom and between parents and teachers. Parents can monitor students' behavior, activities, photos, and videos in real-time. It facilitates the evaluation of classroom processes, which motivates students to better engage with the learning cycle. The tool also provides mechanisms for receiving instant feedback from the instructor. Data collected regarding student progress and behavior can be communicated to parents and administrators via the internet. **URL:** https://www.classdojo.com/

Glogster is a cloud-based platform for creating presentations and facilitating interactive learning. It allows students and teachers to combine text, images, video, and audio to create interactive posters called "glogs" on a web page. The results of collaborative efforts are stored in a specialized library known as Glogpedia. The platform includes a suite of digital tools that support learning through visual content and contains over 50,000 resources across various subjects. **URL:** https://edu.glogster.com/

Trello is a cloud-based application designed for project management and the organization of small-group collaboration. Featuring a user-friendly interface for planning the work of individual members or entire groups, it serves as an effective project management tool. The application is particularly focused on creating environments for independent work, especially for learners who prefer visual information processing. Trello facilitates online communication, assistance, and support between students and teachers. Both educators and students can post comments and provide feedback on completed assignments hosted within the system. Furthermore, instructors are equipped with tools for continuous monitoring of the educational process. The system provides comprehensive data regarding individual and group performance, such as the time spent on the application, the speed of completing exercises, test results, and attendance records. This data assists in providing an objective assessment of completed tasks. **URL:** https://trello.com/

Key Benefits of Using Educational Platforms for All Participants

Practical Advantages for Teachers:

- Access to a Personal Dashboard: Inclusion of essential tools such as schedules, diaries, journals, and electronic mail in one centralized location.
- Content Creation and Distribution: The ability to develop and distribute original educational materials and publish them on interactive boards with online access for students, parents, and colleagues.
- Resource Adaptation: Accessibility to materials created by other educators and the ability to adapt them to meet the specific needs of their students.
- Professional Collaboration: Opportunities to write and read comments or feedback on provided resources, facilitating the exchange of professional experience with colleagues.
- Objective Assessment: Enhancing the objectivity of knowledge evaluation and providing continuous monitoring of individual and group developmental dynamics.
- Parental Engagement: The ability to discuss learning outcomes directly with parents.
- Administrative Efficiency: Relieving teachers of excessive paperwork, thereby creating opportunities for professional self-development during their free time.

Utilizing educational platform resources provides students with the following advantages:

- Anytime, Anywhere Access: The ability to access educational materials regardless of time or location.
- Assignment Submission: Streamlined submission of homework and projects to the instructor for evaluation and feedback.
- Cloud Storage for Academic Work: Hosting completed assignments and notes online for seamless use during lessons, home study, or project collaboration.
- Diverse Material Selection: Access to a broad range of resources, enabling the creation of a personalized learning trajectory.
- Online Portfolio Development: Forming a digital portfolio that includes certificates confirming academic achievements, diplomas from various events, multimedia files (photos/videos), and feedback from teachers, peers, and parents.
- Communication and Collaboration: Opportunities for interaction through electronic mail, instant messaging, and participation in discussion forums with fellow students and educators.

Practical benefits for administrative and management personnel using the platform:

- Real-time Information Access: Providing up-to-date data on the progress of the educational process, knowledge assessment results, student engagement, challenges, and achievements to support informed decision-making.
- Educational Monitoring: Conducting systematic monitoring of the learning process to obtain reliable data on the developmental dynamics of individual students and groups.
- Enhanced Communication Channels: Expanding opportunities for interaction with all participants of the educational process both within and beyond the institution.
- Stakeholder Engagement: Establishing a modern and efficient communication channel with parents.

On one hand, educational platforms simplify the process for teachers to create their own instructional materials and assessment tasks. On the other hand, and more importantly, educators gain access to ready-made electronic learning resources (ELRs) available within systems developed by professionals or other fellow teachers.

YouTube Educational Channels

Popular YouTube channels are becoming significant sources of high-quality educational video content. This content is particularly beneficial for gifted students and those seeking in-depth information. These videos can be utilized during traditional lessons, as well as in blended or distance learning environments. For instance, an instructor may assign a specific video for students to watch when introducing new material or reinforcing previously learned concepts.

The most prominent educational channels include:

1. **TED** – One of the most renowned platforms providing educational video content. It features talks by prominent speakers and thinkers across diverse fields, with subtitles available in over 100 languages. **URL:** https://www.ted.com/
2. **TED-Ed** – An education-focused channel featuring numerous animated lessons and talks regarding pedagogy and specialized academic subjects.

URL: https://www.youtube.com/user/TEDEducation/videos

3. **Vsauce** – A YouTube channel offering a wide range of educational content. It includes playlists on scientific knowledge, physics, human behavior, space, and earth sciences. **URL:** https://www.youtube.com/user/Vsauce/videos
4. **PostNauka** – Launched in January 2012, this project features over 800 scientists, including Nobel laureates and international scholars. The channel offers short video lectures and monologues on scientific theories, concepts, ideas, and facts. **URL:** https://www.youtube.com/user/postnauka/videos
5. **Khan Academy (Russian/International)** – A channel that provides free online educational videos across various subjects. It offers systematized lectures on mathematics, history, healthcare, finance, physics, chemistry, biology, computer science, and economics. **URL:** https://www.youtube.com/user/KhanAcademyRussian/videos
6. **AsapSCIENCE** – An educational channel that produces weekly high-quality videos on various scientific topics. It provides a vast selection of content suitable for primary, secondary, and higher education, as well as English language learning. **URL:** https://www.youtube.com/user/AsapSCIENCE/videos
7. **CrashCourse** – Founded by John and Hank Green, this channel offers comprehensive video courses in physics, philosophy, economics, astronomy, anatomy, history, biology, and literature. **URL:** https://www.youtube.com/user/crashcourse/videos
8. **Minutephysics** – An educational channel dedicated to the study of physics. All videos are concise, with an average duration of approximately one minute. **URL:** https://www.youtube.com/user/minutephysics/videos
9. **The King of Random** – Created in 2010, this channel features videos exploring unconventional uses of standard objects and entertaining scientific experiments. **URL:** https://www.youtube.com/user/01032010814/videos
10. **SciShow** – A series of non-fiction videos covering diverse scientific fields such as chemistry, physics, biology, zoology, meteorology, and computer science. **URL:** https://www.youtube.com/user/scishow/videos
11. **SmarterEveryDay** – An educational channel hosted by American engineer and scientist Destin Wilson Sandlin. It explores the world through science, space flight, neuroscience, and fascinating physical phenomena. **URL:** https://www.youtube.com/user/destinws2/videos

The selection of digital educational tools and the development of digital content or original electronic learning resources require specific knowledge and skills from the educator. A teacher's readiness to implement new solutions is a critical factor in the informatization process. However, one must not overlook the pedagogical expediency of using specific digital technologies, resources, and internet services at particular stages of the instructional process.

Currently, numerous systems exist for developing tests, either as standalone software products or integrated within educational platforms. At present, there is no single "perfect" software tool among the various programs used for knowledge assessment via testing. New tools emerge regularly, and existing ones are continuously being enhanced. Most systems allow for the creation of various types of test items, knowledge assessment, and the acquisition of data regarding the test results for each student or group. We highlight the core requirements that a modern testing and diagnostic system (shell) should meet:

- Creation of diverse question types (multiple choice, single choice, matching, etc.);
- Openness (the ability to modify questions and answers or add new ones);
- Differentiated access rights for administrators, examiners, and examinees;
- Multimedia support (the ability to integrate graphic, audio, and video formats, as well as mathematical formulas);
- Protection against result falsification;
- Maintenance of testing logs for each individual student and group;
- Statistical data analysis**.**

Modern diagnostic systems implementing Artificial Intelligence (AI) algorithms enable the analysis of student actions, provide recommendations, generate tasks based on a specific student's proficiency level, and facilitate the rational management of task distribution. For example, the system can highlight that a large portion of a group is failing to answer questions on a specific topic or alert the teacher when students answer simple questions correctly but lack problem-solving methodologies.

Digital educational platforms elevate the traditional interaction between teacher and student to a new level. These tools function not merely as technical assistants but as systems that stimulate autonomous learning and monitor educational outcomes. The success of the digitalization process is determined by the teacher's readiness to apply new technologies and their ability to correctly integrate them into various stages of the lesson.

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