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THE IMPACT OF INFORMATION AND EDUCATIONAL ENVIRONMENTS ON THE EFFECTIVENESS OF DISTANCE LEARNING IN HIGHER EDUCATIONAL INSTITUTIONS

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Summary: The article explores the transformation of education in response to the dynamic changes in the modern world, particularly in the context of distance learning. It highlights how societal changes, including the global pandemic and martial law in Ukraine, have led to the widespread adoption of online education. This shift requires the integration of Information and Communication Technologies (ICT), prompting the education system to embrace new models that can better address current challenges. Distance learning, which has been employed globally for several years, is now at the forefront of this evolution, requiring the effective implementation of technological tools to ensure educational success.

The research delves into the importance of information and educational environments within higher education, especially in the context of distance learning. One such environment is Moodle, a Learning Management System (LMS) widely used for the development and delivery of online courses. The article describes Moodle as a powerful tool based on social constructivism, which enables students to actively build their knowledge.

The article also emphasizes the principles of open education, such as freedom of choice, flexibility, independence, and extraterritoriality, which Moodle supports.

These principles ensure that students can tailor their learning experience, choosing when and where to study, and participate in a global educational space regardless of geographical constraints. Open education promotes equitable access to quality education, aligning with current educational needs and the goals of modern society.

Despite its numerous advantages, the article acknowledges some limitations of Moodle.

In conclusion, the article highlights that while Moodle is not without its challenges, it plays a crucial role in modernizing education by offering flexibility, supporting independent learning, and providing a reliable system for assessing academic progress. By helping students overcome traditional barriers to education, Moodle is an invaluable tool in the contemporary educational landscape, supporting the transition to more accessible and efficient learning environments in higher education.

Key words: distance learning, information-communication technologies, management-learning systems, educational environment, modular-oriented distance learning environment**.**

Анотація: У статті досліджується трансформація освіти у відповідь на динамічні зміни в сучасному світі, зокрема в контексті дистанційного навчання. Висвітлено, як суспільні зміни, включаючи глобальну пандемію та воєнний стан в Україні, призвели до широкого впровадження онлайн-освіти. Цей зсув вимагає інтеграції інформаційно-комунікаційних технологій (ІКТ), що спонукає систему освіти впроваджувати нові моделі, які можуть краще відповідати на поточні виклики. Дистанційне навчання, яке вже кілька років використовується в усьому світі, зараз перебуває на передовій цієї еволюції, вимагаючи ефективного впровадження технологічних інструментів для забезпечення освітнього успіху.

Дослідження заглиблюється у важливість інформаційно-освітніх середовищ у вищій освіті, особливо в контексті дистанційного навчання. Одним з таких середовищ є Moodle, система управління навчанням (LMS), яка широко використовується для розробки та проведення онлайн-курсів. Стаття описує Moodle як потужний інструмент, заснований на соціальному конструктивізмі, який дозволяє студентам активно формувати свої знання.

У статті також підкреслюються принципи відкритої освіти, такі як свобода вибору, гнучкість, незалежність та екстериторіальність, які підтримує Moodle. Ці принципи гарантують, що студенти можуть адаптувати свій навчальний досвід, обираючи, коли і де навчатися, і брати участь у глобальному освітньому просторі незалежно від географічних обмежень. Відкрита освіта сприяє рівному доступу до якісної освіти, що відповідає актуальним освітнім потребам і цілям сучасного суспільства.

Незважаючи на численні переваги Moodle, у статті визнаються деякі його обмеження.

Насамкінець у статті підкреслюється, що хоча Moodle не позбавлений проблем, він відіграє вирішальну роль у модернізації освіти, пропонуючи гнучкість, підтримуючи незалежне навчання і забезпечуючи надійну систему оцінювання академічного прогресу. Допомагаючи студентам долати традиційні бар'єри на шляху до освіти, Moodle є безцінним інструментом у сучасному освітньому ландшафті, підтримуючи перехід до більш доступного та ефективного навчального середовища у вищій освіті.

Ключові слова: дистанційне навчання, інформаційно-комунікаційні технології, системи управління навчанням, освітнє середовище, модульно-орієнтоване середовище дистанційного навчання.

A general statement of the problem and its connection with important scientific or practical tasks. The modern world is undergoing constant and dynamic changes,

vastly different from what it was a decade or two ago. These changes introduce new challenges and demands for the educational process. Transformations in society and the global landscape are reshaping the structure of education, including higher education. Amid the pandemic and martial law, traditional educational models have become unsustainable. As a result, innovative and modern educational approaches are taking precedence, engaging all participants in novel ways. One prominent example is distance education, which has been adopted globally for several years and relies heavily on information technology.

Analysis of recent research and publications. Numerous publications have explored the significance, features, benefits, and challenges of distance learning. V. Bykov examined the theoretical and methodological foundations of modeling the learning environment in modern pedagogical systems. M. Rassovytska, A. Stryuk, and M. Shyshkina focused on cloud-oriented learning tools as components of the information-based educational and scientific environment in higher education. The development of the information and educational environment in higher education institutions was analyzed by I. Zakharova, L. Panchenko, and V. Rakhmanov. N. Gunko studied the modern information and educational environment as a factor in enhancing the professional and pedagogical training of future teachers. A. Biloshchytskyi and P. Lizunov addressed models and methods for creating a comprehensive information and educational environment within educational institutions. Theoretical and methodological aspects of designing distance learning environments and their developmental potential were explored by M. Zhaldak, Y. Mashbyts, M. Nazar, M. Smulson, and Y. Ilyina. Additionally, M. Kademia and V. Umanets examined distance learning in virtual universities as a pathway to quality education.

Highlighting the previously unresolved parts of the general problem. The novelty of this publication lies in its comparative analysis of various information and educational environments, focusing on their specific applications in addressing the challenges and tasks faced by higher education institutions.

Statement of the Task: The research explores the phenomenon and unique characteristics of using information and educational environments within the framework of distance learning in higher education. The study specifically examines different types of Learning Management Systems (LMS).

The aim of the study is to analyze how different types of information and educational environments operate in a university setting, identify the tasks they address effectively, and determine which systems are best suited for specific tasks.

Presentation of the main research material. In recent years, there has been a significant integration of ICT into the educational process, not only in higher education institutions but also in schools. This shift has been driven by the global transition to distance learning due to the pandemic and, in Ukraine, further accelerated by martial law. This situation presents challenges for both students and educators.

It is essential to examine the theoretical foundations of the current educational paradigm to determine what primarily facilitates the achievement of modern educational goals and the implementation of this new paradigm. Key factors can be identified as tools for modernizing education, which should be considered to address the challenges facing the education system at this stage of development:

- **Integration processes in education:** This includes harmonizing educational standards, curricula, teaching and methodological support, methods, tools, resources, technologies, as well as the organizational, functional, and structural components of the education system and its management.
- **Education informatization:** Aligning education with the goals of the information society. This involves establishing a unified information and educational space—a comprehensive platform integrating content, subjects, computer technologies, and communication tools to promote the integration and democratization of education.

The objective impact of these factors on the development of the education system, combined with the evolving needs of students, shapes the modern principles, goals, constraints, mechanisms, and tools driving the education system's transformation. Together, these elements create a conceptual model of contemporary education, referred to as open education.

The foundational principles of open education are rooted in the modern educational paradigm, aligning with the current educational needs of individuals and society while considering the present capabilities and future objectives of the education system. By examining the various definitions of the multifaceted concept of open education, the following core principles can be identified:

- **Principle of Freedom of Choice:** This principle ensures that students have the freedom to choose their place of study, type of educational institution, academic programs, form of study, specialty, and level of education.
- **Principle of Learning Flexibility:** This principle allows students to design their own individualized learning plans and programs. They can modify or enhance these plans by adding new elements as needed and can switch educational institutions at their discretion.
- **Principle of Time Independence in Learning:** This principle grants students the freedom to choose when to study. It supports the pursuit of education alongside professional activities or other learning endeavors. Students are entitled to follow an agreed-upon individual schedule at convenient times in both synchronous and asynchronous modes, with constant access to educational information resources.
- **Principle of Training Extraterritoriality:** Education is not confined to the physical premises of an educational institution. Students have the right to choose their location freely, regardless of the geographical distance from their educational institution. This principle enables students to continue their studies even if they are in a different city or country, which has become

particularly significant in Ukraine due to martial law and the ongoing armed aggression by Russia.

- **Principle of Economic Attractiveness of Open Education:** This principle emphasizes affordability, ensuring that students can access quality education through open systems. For educators, it highlights opportunities to work with competitive salaries, continuously enhance their qualifications, advocate for open education, and integrate ICT into the teaching process.
- **Principle of Prestige in Open Education:** This principle ensures that education within open systems is viewed as prestigious. Both students and teachers should recognize and appreciate the advantages of participating in open educational systems. Achieving this requires fostering and maintaining a strong reputation for open education systems.

These overarching characteristics of open education reflect the modern educational paradigm. They aim to provide equal access to quality education for anyone motivated to learn throughout life and with the means to do so. At the same time, they serve as tools for advancing integration in education, democratizing access, and informatizing education—key drivers for modernizing the educational system at its current stage of development.

The principles of time independence and extraterritoriality in learning inherently support the existence of distance education, which relies on the implementation of information and educational environments in both secondary and higher education institutions. However, the term "information and educational environment" lacks a universally accepted definition.

One perspective defines it as a set of conditions, based on information and communication technologies, designed to facilitate educational activities while fostering the development of professionally significant and socially relevant qualities in individuals within the context of a digitalized society.

Another interpretation is being offered, describing the information and educational environment as a dynamic pedagogical system. This system integrates educational resources, computer-based learning tools, pedagogical methods, management technologies, and the organization and content of professional and personal development processes. It also supports the self-development of each student.

The tasks of the information and educational environment in higher education institutions encompass informational, educational, communicative, diagnostic, personal development, and reflective components. This environment consists of numerous information objects and their interconnections, as well as tools and technologies for collecting, storing, transmitting, processing, producing, and disseminating information. It also includes systems for reproducing audiovisual content and the organizational and legal structures that sustain these information processes. [3, p.5020]

The effective use of ICT in the educational process is achieved when appropriate learning technologies are thoughtfully and seamlessly integrated, enhancing pedagogical methods, addressing management challenges, and enriching the educational system with accumulated experience, knowledge, and traditions. These contributions help shape the cultural and substantive components of the broader information space, ranging from the scientific and methodological resources of individual higher education institutions to the global Internet. [2, p. 98].

The information and educational space can be categorized into multiple levels. A Level 1 information and educational environment refers to a comprehensive, institution-wide system. In contrast, a Level 2 environment consists of e-learning courses developed by individual educators within specific disciplines.

An example of a Level 1 information and educational environment is Moodle**.**

To begin, it is important to provide a general overview of the Moodle system. Moodle is a Content Management System (CMS) specifically designed to help

teachers develop online courses. Such e-learning platforms are often referred to as Learning Management Systems (LMS) or Virtual Learning Environments (VLE).

The name Moodle stands for **Modular Oriented Distance Learning Environment**. It serves as a comprehensive toolkit for creating individual online courses as well as full-scale educational websites. The platform is grounded in the theory of social constructivism and its application to learning.

Moodle's creator, Australian Martin Dougiamas, aimed to design a system distinct from existing alternatives, rooted in cognitive psychology principles. In this approach, the student is an active participant, independently constructing their knowledge system by utilizing available resources. The teacher's role is to motivate and support students by preparing tasks for independent study, evaluating their work, and refining their understanding.

Social constructivism emphasizes that knowledge is most effectively constructed through collaboration. This occurs when students work in groups, share their experiences and perspectives, and remain open to learning from others.

Moodle is characterized by the following criteria:

Functionality: Moodle allows for course and study group management, includes forums and chat features, and enables analysis of student activity.
Stability: The system is highly stable across various operating modes.
Reliability: Moodle offers easy content updates using existing templates and ensures user protection.
Cost: Moodle is completely free to use.
Modularity: The material is organized into blocks or modules, which is particularly beneficial for modular and rating-based learning.
Support for SCORM: Moodle supports the international SCORM standard.
Assessment System: Moodle features an online system for testing and evaluating knowledge, which is a key advantage for higher education institutions.

The use of Moodle allows educational institutions to:

- Implement a modular approach to the educational process, in line with the Bologna system.
- Provide comprehensive scientific and methodological support for courses.
- Engage the institution in the global scientific and educational community.
- Create a custom online environment for e-learning.
- Develop a distance education system within the university.

Moodle includes a full set of modules that facilitate collaboration between students and between students and teachers.

Conclusions. When examining Moodle, several key advantages for its use become evident. For teachers, Moodle offers a convenient, structured format for organizing the educational and methodological materials of their course, as well as a tool for tracking and managing students' learning activities. It allows teachers to set deadlines for module completion, provides an e-learning platform that aligns with European educational standards as outlined in the Bologna Agreement, and supports the use of text, graphic, audio, and video resources. Teachers can also quickly modify, update, and expand course materials, and ensure that software programs are protected from unauthorized access, changes, and destruction.

For students, Moodle provides access to a structured educational and methodological framework, the ability to self-assess and complete tasks without human intervention, extended access to online resources, and the opportunity to study the material remotely. It also allows students to complete exams ahead of schedule.

A significant challenge of distance education is the need for some form of assessment at the end of the course. The geographical separation of learners makes it difficult to bring them together for exams or tests, as is possible with traditional in-person learning. While email can be used to send and receive exam results, it has several drawbacks, including the teacher spending more time grading written

assignments than in traditional exams. Moodle addresses this challenge by providing efficient tools for assessing learning outcomes, enabling a large number of students to take tests simultaneously and instantly receive their results. Additionally, Moodle eliminates subjectivity in grading, making the assessment process fully transparent and objective. It also helps reduce the stress students often experience in traditional exam settings.

Despite its many advantages, the Moodle system also has some drawbacks. It can be quite complex for users, and there are costs associated with both training and system maintenance.

One of the major disadvantages is the lack of direct interaction between students, teachers, and other course participants. Another issue is the challenge of maintaining motivation and self-discipline, which are crucial in distance learning. Research indicates that many individuals who start e-learning courses do not finish them. Additionally, some users are skeptical about using computer technology or face difficulties operating it. Moodle users often report problems when setting up the system [2, p. 402].

However, it is important to note that some of the drawbacks of using Moodle can have positive outcomes. For example, the reduced level of control by the teacher can encourage students to develop independent work skills. These skills are essential in distance education and will help students effectively tackle real-life and professional challenges, fostering a proactive approach as a specialist. While Moodle cannot replace a full in-person lecture, it can enhance the learning process by incorporating visual elements such as tables, diagrams, charts, and audio-visual files, which can have a positive impact on both lectures and practical sessions.

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