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TECHNOLOGY FOR IMPROVING THE QUALITY OF EDUCATION USING AUTOMATED INFORMATION SYSTEMS IN THE EDUCATIONAL PROCESS (BASED ON HIGHER EDUCATION INSTITUTIONS)

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Abstract: This article explores the technology for improving the quality of education using automated information systems in the educational process, focusing on higher education institutions. The reasons for the necessity of implementing AIS, their advantages and disadvantages, as well as the experience of using these systems in prestigious universities and institutes are analyzed. Special attention is paid to the analysis of AIS usage, as they play a key role in modern education, providing effective management of educational processes.

Keywords: technology, improvement, quality, education, automated, information, systems, educational process, learning, efficiency, students, teachers, personalization, accessibility, innovations, interactive, digital, educational resources, adaptive systems, motivation, effective learning, modern technologies, data analysis

Modern education faces a number of challenges related to ensuring accessibility, quality, and efficiency of learning for all students. In the context of rapid technological development and changing labor market requirements, educational institutions are compelled to constantly improve their methods and approaches to teaching. One of the most promising and effective means to achieve these goals is the use of automated information systems in the educational process.

Technology has become an integral part of education, providing new opportunities for personalized learning, improving the accessibility of education, and enhancing student motivation. Automated information systems enable the creation of flexible and adaptive educational environments, providing students with access to diverse educational resources and tools.

The use of automated information systems in the educational process is not only a necessity but also an opportunity to create modern, flexible, and innovative educational environments that facilitate the successful adaptation of students to the requirements of contemporary society. The choice of automated information systems is justified by their ability to efficiently manage and process large volumes of data, ensure accessibility of information for both students and teachers, as well as enhance communication and interaction in the educational process. These systems enable the optimization of educational material management, automation of assessment and feedback processes, and improvement of learning efficiency through personalized and adaptive teaching methods [1]. Moreover, automated information systems contribute to enhancing monitoring and analysis of student performance, enabling the quick identification of problematic areas and the development of individualized educational strategies.

Let's consider in detail the advantages of using automated information systems in education, including:

- Improving accessibility of education: Automated information systems provide the opportunity for remote learning, which is particularly valuable for students residing in remote regions or having limited access to attending classes at educational institutions. Through online platforms and virtual classrooms, students can receive quality education without leaving their homes, thereby expanding the accessibility of education and promoting inclusivity in the educational process.

- Increasing the efficiency of the educational process: Thanks to automated systems, teachers can easily access necessary educational materials, quickly organize the learning process, and adapt it to the individual needs of the group or individual students. Automated systems streamline assessment processes, making them easier for teachers and more objective and structured for students [2]. This contributes to creating a more efficient and productive educational environment where resources, time, and efforts are used optimally.

- Personalization of learning: AIS facilitates the adaptation of educational materials and teaching methods to the individual needs and learning paces of students. With adaptive systems, students can receive personalized learning approaches tailored to their knowledge level, interests, and learning preferences [3]. This helps create a more comfortable and stimulating educational environment where each student can unleash their potential and achieve optimal learning outcomes.

- Improvement in monitoring and analysis of performance: Educational automated systems provide the opportunity for quick and accurate tracking of student progress through the automation of data collection and analysis processes. This enables teachers to promptly identify areas of difficulty and students' needs, which is a crucial step towards developing individualized educational strategies. Using such systems promotes more effective learning, increasing the chances of successful comprehension of material and achievement of academic goals.

- Expansion of educational opportunities: Thanks to automated systems, students can access extensive educational resources, online courses, and expert knowledge, promoting their professional and personal development.

It's worth noting that the use of automated information systems in education has its drawbacks:

- Technical issues: Automated systems may experience malfunctions such as technical glitches or internet connectivity problems. These issues can lead to limited access to educational resources and hinder the learning process for both teachers and students.

- Limitations in interaction: Remote learning, despite its many advantages such as flexibility and accessibility, may also lead to a reduction in the level of social and academic interaction between students and teachers. The lack of physical presence in the classroom or lecture hall can create barriers to communication and idea exchange, which in turn can affect student activity and motivation.

- Dependency on technology: There is a growing dependency on technology in education, especially when using automated systems, which is becoming increasingly evident. To ensure the effective operation of such systems, appropriate technical infrastructure needs to be provided, which can pose a significant challenge for educational institutions, especially in resource-limited settings. Additionally, qualified specialists are required to support and maintain the system, which may require additional investments and efforts in staff training.

- Security threats: There is a risk of leakage of students' personal information or data breaches when using online platforms and e-learning systems. Ensuring the security and confidentiality of data becomes crucial in the digital learning environment.

These drawbacks highlight the importance of carefully considering the implementation and management of automated information systems in education to mitigate potential challenges and maximize their benefits.

Let's take a closer look at the types of automated information systems and their application in the educational process at leading universities.

1. **Learning Management Systems (LMS)-related AIS:**

  - **Stanford University:**

At Stanford University, Canvas is utilized as the central platform for managing courses, delivering educational materials to students, and conducting online assessments [4]. Canvas offers a wide range of functionalities that assist both teachers and university administration in effectively managing the educational process and ensuring quality learning for students [4].

Stanford University instructors can use Canvas to create and customize course structures, upload educational materials, create assignments and quizzes, as well as set deadlines and interact with students through feedback. This enables efficient assessment of students' knowledge levels and obtaining results directly within the system, simplifying the assessment and feedback process. Thanks to its intuitive interface and extensive customization options, instructors can easily adapt the instruction to their educational goals and students' needs [5].

Furthermore, LMS Canvas has the capability of integrating with other educational tools and applications, allowing it to expand its functionality and meet Stanford University's specific requirements. This flexibility and adaptability make Canvas an effective tool for course management and ensuring a high level of education at Stanford University.

2. **Integrated Data Analytics Systems:**

  - **University of California, Berkeley:**

At the University of California, Berkeley, an integrated system called Tableau is utilized for analyzing student data, monitoring performance, and forecasting trends. This system provides the university with powerful tools for processing and visualizing large volumes of data, enabling analysis of various aspects of academic activities and making informed decisions based on data [6].

One of the key functions of the Tableau system at the University of California is student data analysis. With its help, the university can collect, store, and analyze various student data, including academic performance, course history, extracurricular activities, and other parameters. This allows the university to gain a deep understanding of students' needs and develop individualized educational programs and support [7].

The Tableau system enables the university to forecast trends in education and develop data-based development strategies. Data analysis and visualization help the university identify promising development directions, uncover potential challenges and opportunities, and make informed decisions about implementing new programs and initiatives.

3. Electronic Portfolio Systems:

- Austin Community College:

Blackboard Portfolio is an electronic portfolio tool widely used in educational institutions, including colleges. At a college such as Austin Community College (ACC), Blackboard Portfolio provides students with the ability to create digital portfolios in which they can organize and showcase their academic achievements, projects, and reflections. This tool is typically integrated into the Blackboard Learn educational platform, providing convenience for both students and instructors [8].

The advantages of Blackboard Portfolio include students' ability to independently create and edit their portfolios, upload various types of content such as text, images, and videos, and customize access to their portfolios. This allows students to organize their educational materials, share their accomplishments, and develop self-reflection skills throughout the learning process.

Blackboard Portfolio can also be used by instructors for student assessment, feedback, and support of their academic development. Instructors can create assignments, projects, and tasks that students should include in their portfolios, then assess their work and discuss the results with them. This fosters active student engagement in learning and the development of their professional skills [8].

4. Library Management Systems:

- University of Oxford:

At the University of Oxford, the Aleph system is utilized for automating library operations, which includes bookkeeping, access to electronic resources, and the ability to order books from other libraries. This integrated library management system enables the university to efficiently and reliably manage its library resources, enhancing accessibility and service quality for students, faculty, and researchers [9].

One of the key functions of the Aleph system is the automation of bookkeeping and other library resources. With its help, librarians can easily track the arrival of new materials, manage catalogs, update information about book availability, and monitor the status of collections [10]. This ensures accurate and up-to-date information provision for library users.

The Aleph system provides access to electronic resources. Students, faculty, and researchers can easily search for and access electronic books, journals, databases, and other digital materials through the library's online catalog. This ensures convenience and accessibility for users, especially in the context of the modern digital environment.

5. Recruitment and Student Application Management Systems:

- University of Chicago:

The University of Chicago employs the Slate platform for managing the student admissions process [11]. This system facilitates the complete processing cycle of applications, including application submission, interaction with candidates, and admission decisions [12].

One of the key functions of the Slate platform is the automation of the student admission process. With this system, the university can efficiently collect applications from prospective students, process them, track application statuses, and analyze data to make informed decisions.

Slate facilitates interaction with candidates throughout the admission process. Students can easily submit their applications through the online portal, monitor the status of their applications, submit required documents, and communicate with university representatives through built-in communication tools.

The Slate platform helps the university make informed decisions about student admission. The system provides analytical tools for analyzing data on candidates, their successes, and achievements, allowing the university to assess their potential and compliance with admission criteria [13].

Slate assists the university in attracting and selecting the best candidates, providing them with convenience and transparency in the application process and interaction with the university.

6. Email and Collaboration Systems:

- Arizona State University (ASU):

Arizona State University actively utilizes Google Workspace in its academic and administrative activities [14]. Google Workspace provides students and faculty at the university with access to a wide range of tools for effective work and communication. Using Google-based email, students can communicate with instructors and other students, exchange information, and participate in academic discussions.

Additionally, Google Workspace provides capabilities for collaborative work on documents, presentations, and spreadsheets using Google Docs, Google Slides, and Google Sheets . This allows students and faculty to work on projects in real-time, share ideas and proposals, and receive feedback from colleagues and experts. Google Meet, a tool for video conferencing and online meetings, is used by ASU for conducting virtual lectures, seminars, and meetings. This enables the university to support academic learning and communication in an online format, especially with the increasing opportunities for remote education.

These examples demonstrate the variety of automated information systems applied in universities to improve various aspects of the educational process and enhance the efficiency of managing educational resources.

Conclusions:

The conclusions of the scientific article on the technology for improving the quality of education using automated information systems in the educational process emphasize several key points:

1. The implementation of automated information systems in educational institutions is a promising and effective means of improving the quality of education and enhancing the learning

process. These systems provide a wide range of tools and resources that contribute to increasing accessibility, quality, and efficiency of education.

2. The application of automated information systems in the educational process allows for the personalization of education, adapting it to individual student needs and providing access to diverse educational resources.

3. However, the implementation of such technologies requires not only technical preparedness and infrastructure but also staff training and support from the educational institution's administration.

4. The advantages of using such systems include improving student motivation, activity, and independence in the learning process, which influences their academic performance and achievements.

5. The implementation of automated information systems also contributes to improving the efficiency of managing educational processes, student registration, scheduling, and financial aspects. This allows educational institutions to optimize their operations and reduce time spent on administrative processes.

6. At the same time, it is necessary to consider the drawbacks of using automated information systems, such as the possibility of technical failures, dependence on technology availability, and the need for staff training.

In conclusion, the use of technology in the educational process opens up new opportunities for improving education and preparing students for the demands of the modern world. Further research in this area should focus on analyzing the effectiveness of various technologies, studying their impact on interpersonal relationships and student motivation, and developing innovative methods and approaches to using technology in the educational process.

The list of references:

1. Преимущества введения АИС в образование [electronic resource] URL: https://investim.guru/news/preimuschestva-vvedeniya-ais-v-obrazovanie
2. Хвецкович Э.Б, Мазурик М. С, Автоматизированные информационные системы управления учебным процессом вуза: практическое исследование [electronic resource] URL: https://cyberleninka.ru/article/n/avtomatizirovannye-informatsionnye-sistemy-upravleniya-uchebnym-protsessom-vuza-prakticheskoe-issledovanie [electronic resource] URL: (date of access: April 04, 2024)
3. Современные информационные технологии в образовании [electronic resource] URL: http://itas.pstu.ru/wiki/index.php
4. Canvas Support and Resources [electronic resource] URL: https://med.stanford.edu/edtech/services/lms/medcanvas.html
5. Stanford Canvas – All about University LMS [electronic resource] URL: https://www.takethiscourse.net/stanford-canvas/
6. Cal viz: Tableau enterprise Server [electronic resource] URL: https://technology.berkeley.edu/services/tableau
7. What is Tableau? [electronic resource] URL: https://www.tableau.com/why-tableau/what-is-tableau
8. BLACKBOARD LEARN [electronic resource] URL: https://tled.austincc.edu/faculty-support/technology-tools/blackboard-learn/
9. First Anniversary of Ex Libris Aleph at the University of Oxford's Bodleian Libraries [electronic resource] URL: https://exlibrisgroup.com/press-release/first-anniversary-of-ex-libris-aleph-at-the-university-of-oxford%C2%92s-bodleian-libraries/

10. Audit of the University Libraries (page 3) [electronic resource] URL: https://oia.fiu.edu/pdf/Audit%20of%20the%20University%20Libraries.pdf

11. Managing External Education The University of Chicago [electronic resource] URL: https://registrar.uchicago.edu/faculty-staff/ais-user-guides/managing-external-education/

12. Slate Technology [electronic resource] URL: https://apro.ucr.edu/slate

13. Slate FeaturesWhat features do we use in Slate? [electronic resource] URL: https://myusf.usfca.edu/slate/features#:~:text=Slate%20is%20a%20relational%20database,test%20scores%20submitted%2C%20and%20more.

14. G Suite for education is helping ASU [electronic resource] URL: https://edu.google.com/case-studies/arizona-state-university/