

Development Of A Database Model For A Digital Platform Designed To Integrate The Activities Of Stakeholders In Inclusive Education

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Abstract. This article investigates the development of a database model for a digital platform designed to integrate the activities of stakeholders in inclusive education. During the study, a database structure was proposed to manage the activities of the stakeholders involved in the inclusive education process, including students, teachers, parents, psychologists, and administrators, within a unified information environment. The mechanisms for storing and processing adaptive educational content, individual learning trajectories, monitoring results, and accessibility parameters for students with disabilities are also described. The article provides a scientific analysis of ER diagrams, relationships between users, and the principles of ensuring data security. The proposed model contributes to improving the efficiency of inclusive Learning Management System (LMS) platforms, automating the educational process, and ensuring an individualized approach to learning.

Keywords: inclusive education, LMS system, database, database model, ER diagram, adaptive learning, accessibility, electronic platform, individual learning trajectory, monitoring system, relational database, information system, pedagogical technologies, digital education.

Introduction

The present day digital technology, the rapid development of the education system in both the new opportunities it has created. Moreover, inclusive education organization in modern software tools in use important is professional is. Inclusive education for all students, including the possibility of limited children also equal educational opportunities to create aims pedagogical process is.

Traditional education system in the possibility of limited students with individual work, monitored, get to go and all of the entities, activities coordination, helping them to a number of problem there is. The same reason for the inclusive education of subjects of activity of a single information environment in the organization of the executive software platform, to create urgent tasks one is.

Today, digital technologies are becoming an integral part of the education system. In particular, the importance of electronic platforms and Learning Management System (LMS) systems is increasing in the development of inclusive education. Inclusive education is a pedagogical process aimed at providing equal educational opportunities to all learners, including individuals with disabilities. To organize this process effectively, the development of modern information systems and databases is of particular importance[1,2].

Traditional LMS systems are often designed for general users and may not fully meet the specific needs of inclusive education. Therefore, the development of a database model that is adapted to the needs of students with disabilities, supports adaptive learning, and meets accessibility requirements is one of the relevant issues in modern digital education. The aim of this article is to develop an effective database model for inclusive LMS systems and to analyze its pedagogical and technological capabilities.

MAIN PART

In the inclusive education system, the main stakeholders include students, teachers, parents, psychologists, and administrators. The use of electronic platforms and Learning Management Systems (LMS) is important for organizing effective interaction and collaboration among these stakeholders.

The software provides the following capabilities[1,2]:

- formation of an individual learning trajectory;
- creation of adaptive learning materials;
- monitoring and analysis of learning outcomes;
- continuous communication with parents;

- provision of accessibility features.

The use of accessibility technologies is particularly important in inclusive educational platforms. In particular, the following features create a convenient learning environment for students with disabilities:

- text-to-speech functionality;
- video lessons with subtitles;
- speech-to-text systems;
- high-contrast interfaces;
- large-font design.

In addition, artificial intelligence-based monitoring systems can be used to analyze students' activity, academic performance, and learning difficulties. Based on the results of this analysis, individualized recommendations can be generated.

The proposed software platform may consist of the following modules:

- student dashboard;
- teacher dashboard;
- psychologist monitoring module;
- parent portal;
- statistical analysis module;
- AI-based recommendation system.

The proposed platform not only improves the efficiency of inclusive education management but also contributes to the automation of the pedagogical process.

Inclusive LMS systems are designed not only for providing and managing learning materials but also for managing individualized learning, monitoring students' progress, and organizing collaboration among different stakeholders. The main functions of these systems include:

- *creating individual learning trajectories;*
- *monitoring students' development and progress;*
- *providing adaptive learning materials;*
- *supporting accessibility features;*
- *organizing collaboration with parents and specialists;*
- *generating statistical analyses and reports.*

In such systems, the database serves as a central component that enables the activities of all users to be managed within a unified information system.

Database Component	Function
User Information	Stores general information and account data of platform users
Student Profiles	Stores students' personal, educational, and individual learning information
Teacher Information	Stores information about teachers, their qualifications, and teaching activities
Courses	Stores information about courses, subjects, learning materials, and course content
Assignments	Stores assignments, deadlines, submission status, and assessment results
Special Needs Parameters	Stores students' individual needs, accessibility requirements, and adaptation parameters
Student Development Monitoring	Stores and analyzes students' learning progress, performance, and development indicators
AI Recommendations	Stores and generates individualized learning recommendations based on student data and learning outcomes

Table 1. Structural Framework of the Proposed Database Model

Through this model, it becomes possible to manage all user activities within a unified information system.

Advantages of Using ICT (Information and Communication Technologies) for Children with Special Educational Needs.

The use of ICT provides a number of important advantages for children with special educational needs[3-5]:

- computers contribute to increasing children's autonomy and expanding their opportunities for education;
- children with special educational needs can complete assignments at their own pace of learning;
- children with visual impairments can access and use the Internet alongside their sighted peers;
- specialized devices and software facilitate communication and interaction between children with communication difficulties, their peers, and teachers;
- the use of technological means of communication contributes to creating a positive social image of children both at school and in the community;
- children's confidence in using ICT helps them use the Internet for completing homework and meeting other educational needs.

The use of new technologies as technical support enables children with special educational needs to participate more actively in the educational process. For example, ICT enables children with motor impairments to write using alternative technological tools, while for children with visual impairments, it provides opportunities to access and engage in reading activities.

From this perspective, technologies contribute to developing children's ability to manage their environment, support the resolution of educational and social challenges, and provide access to information resources. In other words, assistive technologies can compensate for limitations in certain natural functional abilities of the human body, thereby optimizing children's processes of acquiring and assimilating knowledge.

Conclusion

The development of a database model for inclusive LMS systems is one of the important areas of modern digital education. The proposed model enables effective management of the activities of stakeholders in inclusive education, as well as the organization and monitoring of individualized learning. Furthermore, the application of accessibility and adaptive technologies contributes to creating an accessible and supportive electronic learning environment for students with disabilities.

In the future, the development of intelligent inclusive LMS platforms incorporating artificial intelligence technologies based on the proposed database model can be considered a promising direction for further research and technological development.

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