# **AI EXAM GENERATOR**

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A THESIS PROJECT PROPOSAL

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1. **Background of the Study**

The increasing integration of digital technologies in education has transformed how teaching and learning are conducted. However, one of the most time-intensive tasks educators continue to face is the creation of assessments that accurately measure student understanding. Teachers are often burdened with manually generating quizzes and exams, which requires deep analysis of learning materials, attention to question variety, and a balance of difficulty levels. In modular learning setups—where students learn independently through distributed materials—this task becomes even more repetitive and challenging.

With the rise of Artificial Intelligence (AI), there is a growing potential to automate complex educational tasks, including the generation of assessments. The Digital Exam **Generator** is designed as a smart solution that automatically creates exam questions from educational modules provided by teachers. By utilizing Natural Language Processing (NLP), the system analyzes instructional content, identifies key learning points, and produces relevant questions in various formats such as multiple-choice, true or false, and short answer.

This system not only reduces the workload on educators but also ensures the consistency, relevance, and adaptability of assessments across different subjects and grade levels. Moreover, it contributes to the modernization of educational practices by leveraging AI to enhance productivity and accuracy in test creation. In doing so, the AI Exam Generator supports both teachers and institutions in delivering more effective and time-efficient assessments in today's digitally driven learning environment.

1. **Problem Statement**

Traditional exam creation methods, such as manual question writing and repetitive test formatting, have long been the standard in education but often pose challenges for today’s teachers—especially in modular or distance learning setups. These traditional methods are time-consuming, mentally exhausting, and prone to inconsistency in question quality, relevance, and difficulty. As the demands on educators grow, the manual preparation of assessments can lead to burnout, reduced teaching time, and assessments that fail to fully align with the learning objectives of the module content.

This problem requires a solution because there is a growing need for intelligent, time-saving tools that can automatically generate accurate and relevant exam questions from instructional materials. Leveraging artificial intelligence and natural language processing allows for faster quiz creation, reduced workload, and more consistent quality. Integrating such smart tools into the education system empowers teachers to focus more on instruction and feedback, while ensuring that students receive well-structured assessments that support learning outcomes

**Objectives**

**General Objective**

To develop an AI-powered system that automatically generates accurate, relevant, and varied exam questions based on the content of teacher-provided learning modules to improve the efficiency and quality of assessment creation in educational settings.

### **Specific Objectives**

* **To design a user-friendly interface that enables teachers to upload module files and input custom prompts for question generation.**
* **To design a user-friendly interface that enables teachers to upload module files** in formats such as PDF, DOCX, or plain text **and input custom prompts for question generation.**

1. **To integrate an AI language model capable of interpreting both the uploaded content and the teacher’s prompt to produce relevant and structured exam questions.**
2. **To implement functionality for reviewing, editing, and exporting AI-generated questions in various formats such as PDF or Word.**
3. To generate various types of exam questions (e.g., multiple-choice, true or false, short answer) based on the extracted information from the modules.
4. **Scope and Delimitations**

### **Scope**

This study focuses on the design and development of a web-based application called **AI Exam Generator** that automatically creates exam questions from teacher-provided learning modules. The system will utilize Natural Language Processing (NLP) to analyze the uploaded instructional content and generate questions in various formats, such as multiple-choice, true or false, and short-answer types. The application will also include a user interface where teachers can upload modules, review generated questions, make edits, and export quizzes in formats like PDF or Word. The system aims to support modular and traditional learning environments by streamlining the assessment creation process and improving question quality and alignment with learning content.

### **Delimitation**

This system is limited to processing textual instructional materials in English and in digital formats such as PDF, DOCX, or plain text. It does not support scanned handwritten documents or non-text-based inputs like images, audio, or video. The question generation capability is focused on basic question types and does not include higher-order formats such as essay questions or interactive drag-and-drop assessments. Additionally, the AI-generated questions are based on the content of the uploaded module and do not pull from external references or learning standards. The system is intended for use by educators and not designed for direct student interaction or automatic grading of responses.

1. **Significance of the Study**

**Teachers and Instructors.**

Educators, especially those handling modular or blended learning setups, will benefit from an AI-powered system that reduces the time and effort needed to create quizzes and exams. The system automates the generation of relevant, well-structured questions based on uploaded modules and custom prompts, allowing teachers to focus more on instruction and less on repetitive manual tasks.

**Students.**

Students will receive more consistent and well-aligned assessments that accurately reflect the topics and objectives taught in class. This leads to improved evaluation fairness and supports better learning outcomes by providing clearer insights into student understanding.

**Academic Institutions.**  
Colleges and universities can streamline their academic workflows through the system, which enhances instructional productivity and supports the transition toward digital teaching tools. It contributes to overall institutional efficiency and ensures that educators are equipped with modern resources for assessment creation.

**Instructional Designers and Curriculum Developers.**  
This tool can serve as a valuable aid in aligning assessments with curriculum standards. Designers can use the system to generate baseline question sets or prototypes for evaluation, speeding up the content development process and ensuring better alignment with learning outcomes.

**Future Researchers and Developers.**  
This study provides a foundation for further exploration into AI-powered educational tools. It may guide future innovations in assessment automation, natural language processing in education, and other intelligent systems designed to enhance teaching and learning in higher education.

1. **Initial Review of Related Systems/Studies**

The most important aspect of the research about Educational Technology (EdTech) is how it determines the changes in traditional learning environments, which incorporates the use of advanced technology tools and systems. It focuses on the way EdTech has been developing since its inception, as a primitive computer-assisted instruction to a more sophisticated form of AI-enabled systems, making the teaching and assessment systems more advanced. Especially, the study highlights the opportunity EdTech has to enhance efficiency, accessibility, and personification of education and discusses the issues of implementation including digital literacy and infrastructure (Yang, 2024).

The other important study is the document that gives a detailed study on trends of EdTech research at a global level between 1950-2021 through the use of bibliometric techniques. It reviewed more than 135,000 articles in 156 journals and noted the dramatic increase in the number of publications on EdTech following 2000, most of them being located in the area of social sciences and computer science. Areas of focus entail interactive learning, virtual reality, and distance education with the United States being dominant in volume of publications as well as cooperation. Such understandings provide a powerful basis of novelties like AI-based technologies like the AI Exam Generator (Gunes et al., 2022).

The third paper is a critical analysis of the way the EdTech is being frequently employed to bring continuity to the model of teaching rather than to change it. It touched upon the topic of emergency remote schooling, data privacy, and digital equity. The authors stressed that, as promising as it seems to be, EdTech has not yet released its full potential because it has yet to focus on the student-centered learning paradigm (Darling‐Aduana, 2024).

With its emphasis on innovation and publishing of academic works, a different study emphasized how the emerging technology, generative artificial intelligence, redefines the delivery of EdTech research. It explored the issues of cost, scaling, peer-review, and ethical publishing and called to be more accommodative and sustainable in the future of EdTech publishing (Corrin et al., 2024).

In one study, the authors focused on the way digital technology is transforming education by providing bendable, universal and distant learning opportunities. It has pointed out how EdTech helped during the COVID-19 pandemic in increasing the rate of digitalization and opening the world to the possibility of quality education (Perspective Chapter: Education Technology (EdTech) and the Online Course Revolution, 2023).

Independent study identified EdTech in terms of a procedural approach to improving teaching and learning by modeling and testing instructions. It focused on the fact that modern tools, like the AI Exam Generator, are needed to assist teachers and enhance the related practises (The Role of Educational Technology in Academia, 2024).

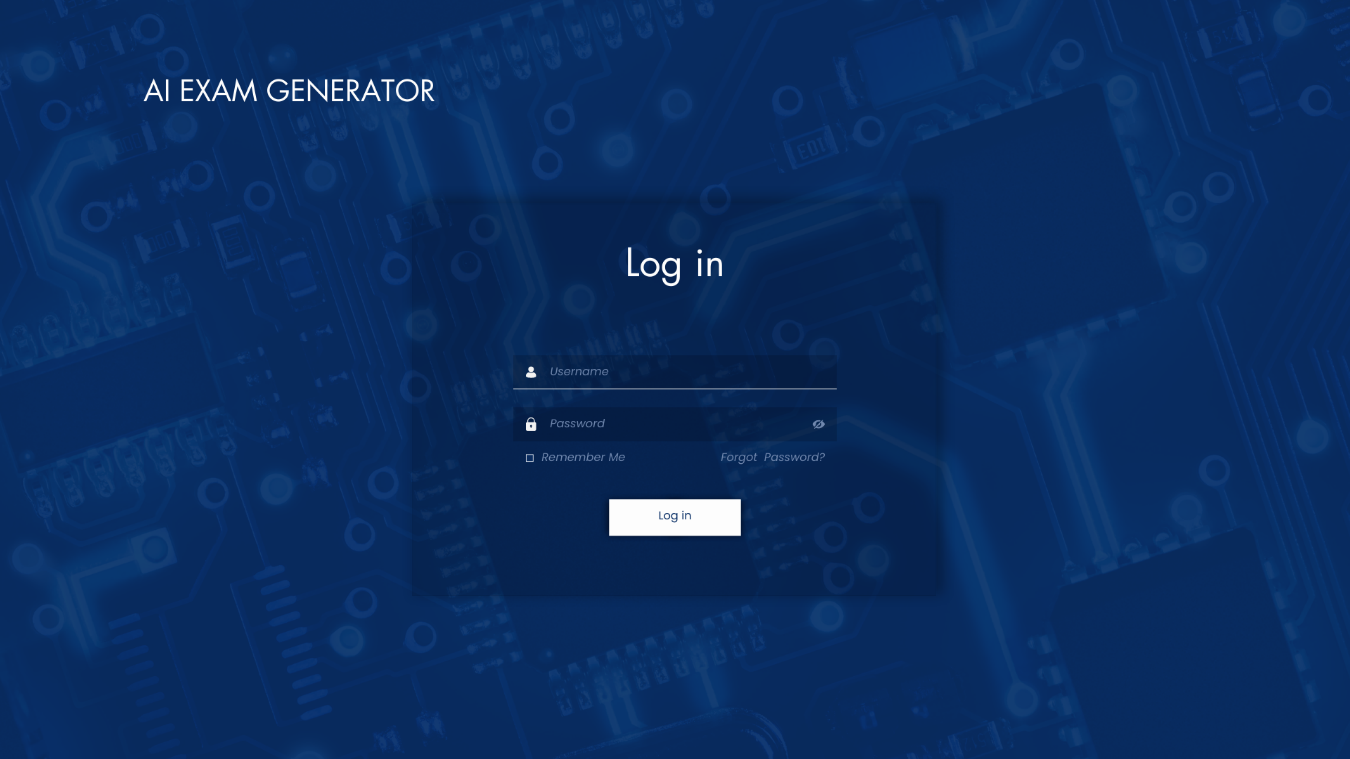
Research that was done in England post-pandemic examined the implementation of EdTech in schools and colleges. It concluded that successful uptake is associated with improved scores, grow in teacher confidence, and communication. Above all, it pointed out that the attitude of educators and learners toward the use of technology is extremely important in the adoption process (Gibson et al., 2023).

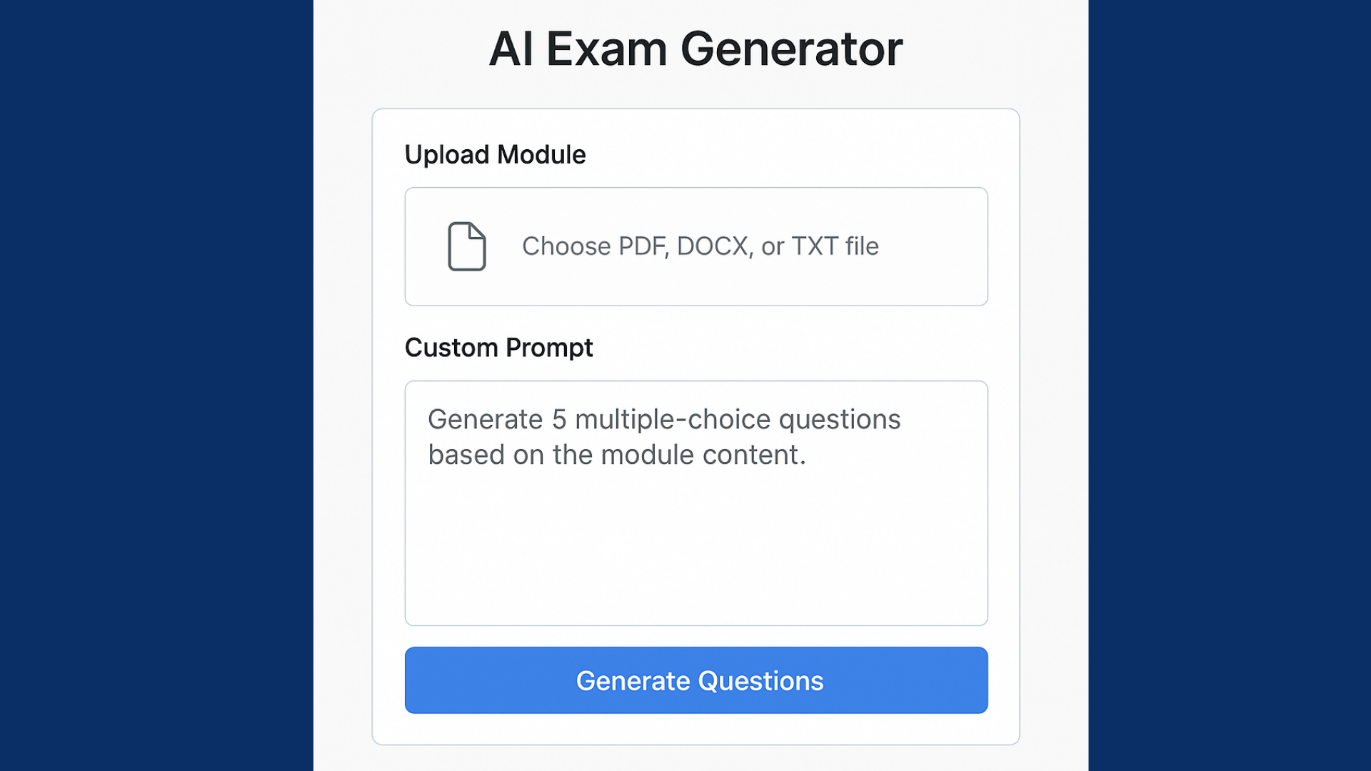
One of the other studies focused on the role of EdTech design as empowering or restrictive based on its intentionality. Based on extensive interventions in India, the study concluded that properly designed digital learning experiences can boost student agency and their increased engagement (Mulla & Nagarjuna, 2023).

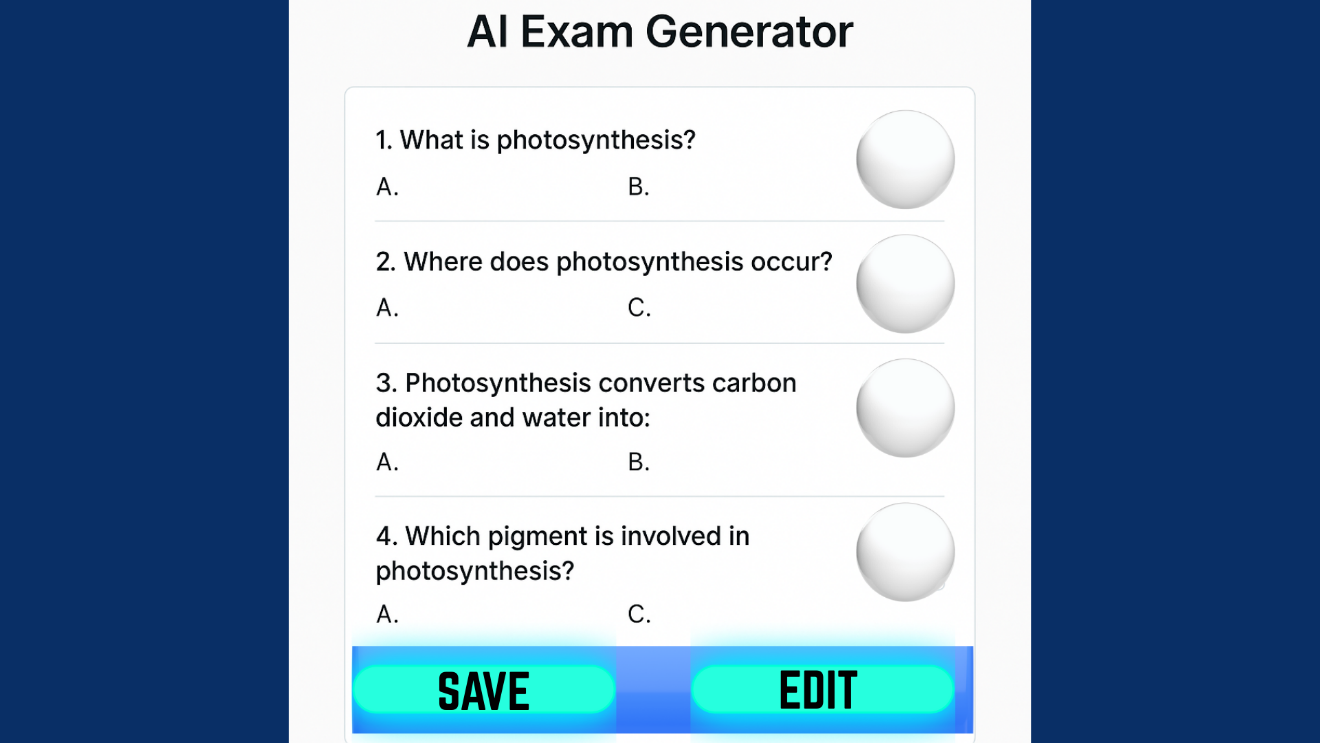
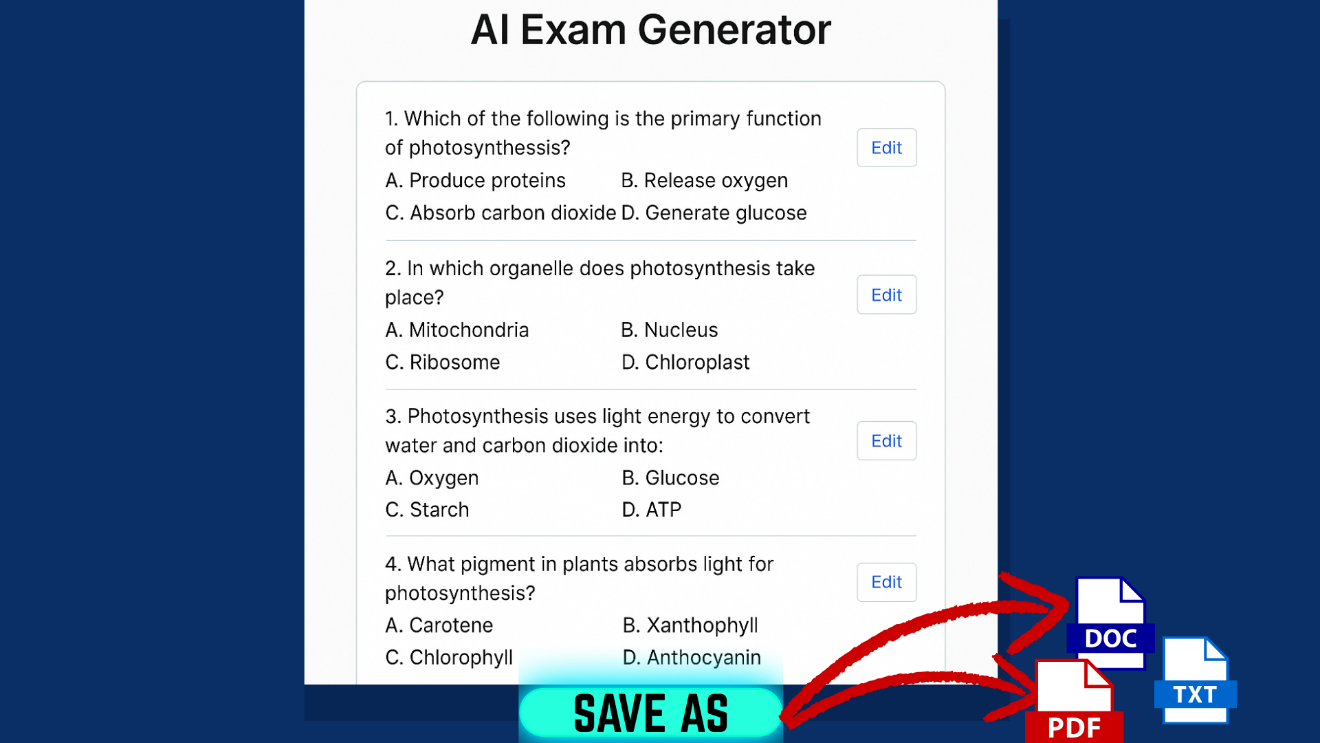
The study of mental modelling of teachers has shown that although the majority of them acknowledge the presence of EdTech as a tool, not all of them have a complete understanding of its pedagogical power. That is why more training is necessary along with such tools as the AI Exam Generator to make it effective to use it (Zeytinli & Ekici, 2022).

Lastly, an analogy made on the Indian EdTech market underlined the importance of the expansion of access to the internet and affordable smartphones as the major drivers of the sector. The pandemic increased the pace of digital learning as well, and whether it is the elementary school or college students faced, scalable AI-assisted tools such as the AI Exam Generator are as timely as never before (Kharbanda & Benjamin, 2024).

1. **Methodology Overview**
2. This project proposes the use of the **Modified Waterfall Model** as the development methodology for the **AI Exam Generator** system. This model follows a structured progression through key development phases—**Requirements Analysis, System Design, Implementation, Testing, and Evaluation**—while allowing limited iteration to accommodate feedback and refinements during the development process.
3. The development will begin with the **Requirements Analysis** phase, where functional and technical specifications will be identified. Data will be collected through informal interviews with educators and academic staff to understand the challenges they face in manually creating quizzes and exams from learning modules. Additional methods such as document review of instructional materials and observation of current assessment workflows will ensure that the system’s design is grounded in actual classroom practices and educator needs.
4. In the **System Design** phase, the architecture of the AI Exam Generator will be mapped out, including the layout of the user interface, system flow, user interaction pathways, and integration of Natural Language Processing (NLP) components. The design will define how the system handles module uploads, content extraction, AI-driven question generation, and quiz exporting. Technologies such as HTML, CSS, JavaScript (for the frontend), Python with Flask or Django (for the backend), and OpenAI’s API or similar NLP models will be used to enable AI-powered question generation. A lightweight database (e.g., SQLite or Firebase) may be used for temporary data storage if needed.
5. The **Implementation** phase will involve coding the system using development tools such as Visual Studio Code. During this phase, individual modules will be built, including file upload functionality, content viewer, question generator, review interface, and export tools (PDF, DOCX, or Google Forms integration). The AI module will use machine learning or large language models to analyze the module content and generate relevant quiz questions.
6. Following development, the **Testing** phase will include unit testing, integration testing, and user acceptance testing (UAT) to ensure that the system operates according to the defined specifications. Teachers will be involved in user testing to assess the quality of the generated questions and the usability of the interface.
7. The final phase, **Evaluation**, will focus on assessing the system's performance and effectiveness based on teacher feedback, system usability metrics, and the accuracy and relevance of the AI-generated questions. Although the Modified Waterfall Model follows a linear flow, limited adjustments may be made to earlier stages to address minor issues discovered during testing and evaluation. This approach ensures that the final system meets the instructional needs of educators while incorporating essential feedback throughout the development process
8. **Sample User design Interface**







1. **Gantt Chart/Initial Timeline**

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| --- | --- | --- | --- |
| **Task** | **Duration** | **Start Date** | **End Date** |
| Requirements Gathering | 4 days | July 02, 2025 | July 06, 2025 |
| System Design | 6 days | July 07, 2025 | July 12, 2025 |
| Frontend Development | 19 days | July 13, 2025 | July 31, 2025 |
| Backend Development | 31 days | August 01, 2025 | August 31, 2025 |
| Security implementation | 6 days | September 01, 2025 | September 06, 2025 |
| System Testing | 2 days | September 2025 | September 2025 |
| User Acceptance Testing | 4 days | September 2025 | September 2025 |
| Post-defense revisions |  | September 2025 | October 25, 2025 |
| Testing and debugging | 15 days | October 26, 2025 | November 09, 2025 |
| Deployment | 19 days | November 10, 2025 | November 28, 2025 |

**References**

Yang, Y. (2024). Transforming Learning Landscapes: The Evolution and Impact of Educational Technology. https://doi.org/10.31219/osf.io/fj8k2

Gunes, U., Tonbuloğlu, B., Tonbuloğlu, İ., Yıldırım, K., & Karataş, İ. (2022). Educational technologies a bibliometric approach. Marmara Üniversitesi Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi. https://doi.org/10.15285/maruaebd.1148289

Darling‐Aduana, J. (2024). Introduction to the Section on Education Technology. 517–521. https://doi.org/10.1007/978-3-031-69362-5\_70

Corrin, L., Han, F., & Huijser, H. (2024). Navigating the terrain of academic publishing in educational technology. ASCILITE Conference Proceedings, 653–657. https://doi.org/10.14742/apubs.2024.1448

Perspective Chapter: Education Technology (EdTech) and the Online Course Revolution. (2023). IntechOpen eBooks. https://doi.org/10.5772/intechopen.109227

The Role of Educational Technology in Academia. (2024). Advances in Information Quality and Management, 1–12. https://doi.org/10.4018/978-1-6684-7366-5.ch038

Gibson, S., Carroll, C., & Brown, C. (2023). Successful Implementation of Education Technology in Schools and Colleges. 1–8. https://doi.org/10.1109/fie58773.2023.10343231

Mulla, S., & Nagarjuna, G. (2023). EdTech as an Empowering Tool: Designing Digital Learning Environments to Extend the Action Space for Learning and Foster Digital Agency (pp. 69–74). Springer Science+Business Media. https://doi.org/10.1007/978-3-031-43393-1\_8

Zeyti̇nli̇, F., & Ekici, G. (2022). Eğitim Teknolojisi Kavramıyla İlgili Ortaokul Öğretmenlerinin Zihinsel Modelleri. https://doi.org/10.29329/tayjournal.2022.491.05

Kharbanda, C., & Benjamin, A. (2024). An Exploratory Study on Evaluating the efficiency of Strategic Innovation in the Indian EdTech Landscape. Indian Scientific Journal Of Research In Engineering And Management. https://doi.org/10.55041/ijsrem38066