

# MASTISK AI: Advancing Educational Technology through AI-Driven Adaptive Learning Systems

Shayan Deep Pal<sup>1</sup> and J. Pandit<sup>2</sup>

<sup>1</sup>Department of Electronics and Telecommunication Engineering, JIS School of Polytechnic, Kalyani-741235

<sup>2</sup>Department of Physics, JIS School of Polytechnic, Kalyani-741235

\*Email: shayandeepal@gmail.com

**Abstract** - The emergence of AI in educational technology has brought forward innovative methods to enhance the learning experience. MASTISK AI represents a cutting-edge educational platform that employs artificial intelligence to address critical challenges in traditional exam preparation and student-teacher interaction [1]. This research examines how MASTISK AI generates dynamic and personalized learning content by analyzing historical exam data, thereby preventing the redundancy of repetitive questions that plague conventional platforms. Additionally, MASTISK AI fosters more effective real-time student-teacher engagement through AI-generated questions and adaptive learning tools [2]. The system's potential to improve learning outcomes and streamline educational processes is evaluated through detailed analysis and empirical evidence.

**Keywords:** *MASTISK AI, Artificial Intelligence, Real-Time Interaction, Dynamic Content Generation*

## 1. INTRODUCTION

Educational technology (EdTech) is increasingly relying on artificial intelligence (AI) to transform traditional learning paradigms. One of the key limitations in conventional exam preparation apps is the repetitive nature of questions, which often leads to rote memorization rather than a deep understanding of the subject matter. Additionally, the lack of effective one-to-one and live interaction between teachers and students further hampers the learning process, as students do not receive immediate feedback and assistance. MASTISK AI addresses these challenges by integrating AI-

driven adaptive learning tools that generate new questions in the same format as real exams, based on historical data. This approach prevents the issue of question repetition, ensuring that students encounter a wider variety of problems that better prepare them for actual exams. Furthermore, the platform enhances real-time interaction between teachers and students by offering AI-generated questions, MCQs, and quizzes that align with students' desired patterns and difficulty levels.

## 2. OBJECTIVES

The primary objective of this research is to assess the effectiveness of MASTISK AI in overcoming the limitations of traditional exam preparation and enhancing real-time student-teacher interaction. The study will explore how AI-generated content can replace repetitive questions with dynamic and personalized learning materials, thereby improving student engagement and understanding. Additionally, the research will evaluate how MASTISK AI facilitates real-time feedback and interaction, leading to a more efficient and effective teaching process.

## 3. BENEFICIARIES

1. Students: Benefit from a diverse range of dynamically generated questions that enhance their preparedness for exams and promote deeper understanding.
2. Teachers: Gain access to AI-generated resources that streamline the teaching process, allowing for more effective student engagement and real-time feedback.

3. Educational Institutions: Improve the overall quality of education by adopting a platform that tailors learning experiences to individual student needs and supports teacher efficiency.
4. EdTech Developers: Obtain insights into the development of AI-driven educational platforms that address key challenges in traditional learning environments.

#### **4. VALUE OF RESULTS**

1. Mitigation of Repetitive Learning: By eliminating repeated questions, MASTISK AI encourages students to engage with a broader range of problems, promoting deeper understanding and better exam preparedness.
2. Adaptive Learning and Personalized Content: The platform's AI algorithms tailor questions and learning materials to each student's progress and learning style.
3. Enhanced Student-Teacher Interaction: MASTISK AI enables teachers to provide real-time feedback and adapt their teaching strategies based on AI-generated insights and student performance.
4. Streamlined Teaching Process: By integrating AI tools into the learning environment, teachers can focus on more meaningful interactions with students, improving the overall educational experience.

#### **7. BACKGROUND**

Traditional exam preparation apps are often criticized for their reliance on a fixed set of questions, which students eventually memorize. This not only reduces the effectiveness of practice sessions but also fails to prepare students adequately for actual exams. Additionally, the lack of real-time interaction between teachers and students in these platforms further diminishes the learning experience, as students do not receive the necessary support and feedback to address their weaknesses promptly.

MASTISK AI was developed to address these significant challenges by leveraging AI to create a more dynamic and personalized learning environment. The platform uses historical exam

data to generate new questions in the same format as actual exams, providing students with a wider variety of problems to solve. Moreover, the platform enhances student-teacher interaction by enabling real-time engagement through AI-generated questions, quizzes, and performance analytics.

#### **5. STATEMENT OF PROBLEM**

The central issue addressed by MASTISK AI is the ineffectiveness of traditional exam preparation platforms due to the repetitive nature of their questions and the lack of real-time student-teacher interaction. These limitations result in students memorizing answers rather than understanding the material, leading to suboptimal exam performance and learning outcomes.

#### **6. PROBLEM DEFINITION**

Traditional exam preparation platforms often rely on a static set of questions, which students quickly become familiar with, leading to rote memorization rather than meaningful learning. Additionally, these platforms typically do not facilitate real-time interaction between teachers and students, hindering the ability of teachers to provide immediate feedback and support. MASTISK AI seeks to overcome these limitations by using AI to generate new, personalized questions and by enhancing real-time engagement between students and teachers.

#### **8. EXTENT OF RESEARCH**

The research on MASTISK AI focuses on developing and validating the platform's ability to generate dynamic learning content and facilitate real-time student-teacher interaction. Initial studies have demonstrated the platform's potential to improve student engagement and learning outcomes. However, further research is required to refine the AI algorithms, enhance the user experience, and conduct large-scale trials to evaluate the system's impact across diverse educational settings.

## 9. PRESENT METHODS OF TACKLING THE PROBLEM

Current methods of addressing the problem include the use of static question banks in exam preparation apps and traditional classroom settings where teachers provide feedback in a delayed manner. Some EdTech platforms have introduced limited adaptive learning features, but these solutions often do not fully address the issue of repetitive questions or the lack of real-time student-teacher interaction. MASTISK AI aims to offer a more comprehensive solution by integrating AI-driven adaptive learning tools that generate new questions and facilitate real-time engagement.

## 11. PROPOSED SOLUTION

MASTISK AI offers a novel solution to the challenges of repetitive exam preparation and limited student-teacher interaction through its AI-driven adaptive learning platform. The proposed system includes the following key features:

1. **AI-Generated Questions:** The platform generates new questions in the same format as real exams, based on historical data, to prevent repetition and enhance exam preparedness.
2. **Real-Time Feedback and Interaction:** MASTISK AI enables teachers to interact with students in real-time by providing AI-generated questions, quizzes, and performance analytics, facilitating immediate and meaningful engagement.
3. **Adaptive Learning:** The platform tailors learning materials to each student's progress and learning style, providing personalized content that adapts to their needs.
4. **Enhanced Teaching Efficiency:** By streamlining the teaching process with AI-generated resources, teachers can focus on more effective student engagement and support.

## 10. ALTERNATE SOLUTION AND APPROACHES

Alternative approaches to personalized education include enhancing existing exam preparation platforms with AI-driven features, developing mobile applications that provide personalized learning experiences, and integrating AI tools into traditional classroom settings [3]. While these approaches offer some benefits, MASTISK AI distinguishes itself by offering a comprehensive solution that addresses both the issue of repetitive questions and the need for real-time student-teacher interaction.

## 12. NOVELTY OF APPROACH

The approach taken by MASTISK AI is unique in its integration of AI-driven adaptive learning tools that generate personalized content in real-time [4]. Unlike traditional platforms that rely on static content, MASTISK AI continuously adapts to each student's progress, providing new and varied questions that better prepare them for exams. Additionally, the platform enhances real-time interaction between teachers and students, making the learning process more engaging and effective.

## 13. CONCLUSION

MASTISK AI presents a significant advancement in educational technology by addressing key challenges in traditional exam preparation and student-teacher interaction [5]. The platform's use of AI to generate dynamic and personalized learning content, coupled with its ability to facilitate real-time engagement, has the potential to revolutionize how students learn and prepare for exams. This research demonstrates the value of MASTISK AI in improving learning outcomes and streamlining the teaching process, paving the way for future developments in AI-driven education.

#### 14. REFERENCES:

- [1] Asada, M., Hosoda, K., Kuniyoshi, Y., Ishiguro, H., Inui, T., Yoshikawa, Y., Ogino, M., Yoshida, C. (2009). "Cognitive developmental robotics: a survey". *IEEE Transactions on Autonomous Mental Development*. **1** (1): 12–34.
- [2] Beal, J.; Winston, Patrick (2009), "The New Frontier of Human-Level Artificial Intelligence", *IEEE Intelligent Systems*, vol. 24, pp. 21–24,
- [3] Buiten, Miriam C (2019). "Towards Intelligent Regulation of Artificial Intelligence". *European Journal of Risk Regulation*. **10** (1): 41–59.
- [4] Chalmers, David (1995). "Facing up to the problem of consciousness". *Journal of Consciousness Studies*. **2** (3): 200–219.
- [5] Peter Brusilovsky (2003). "Adaptive and Intelligent Web-based Educational Systems". *International Journal of Artificial Intelligence in Education*. **13** (2–4): 159–172.



#### BIOGRAPHIES

**Shayan Deep Pal** is a student of JIS School of Polytechnic, Kalyani, pursuing Diploma Engineering in the Electronics and Telecommunication Engineering (ETCE) branch. He is the Founder of MASTISK AI, a visionary startup aimed at revolutionizing competitive exam preparation using AI-driven question generation and analytics. With a deep passion for technology and innovation, Shayan strives to make education more accessible, efficient, and personalized for students across India.