

A Study on the Impact of Artificial Intelligence Tools on MBA Students' Learning Outcomes

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Abstract

Technology has introduced the revolutionary changes in the world of education. The rapid integration of Artificial Intelligence (AI) tools in higher education has transformed teaching–learning processes, especially in management education. AI-enabled systems such as intelligent tutoring, adaptive assessments, and learning management platforms enhance personalized learning, engagement, and self-directed study among MBA students. This study examines the impact of AI tools on learning outcomes of MBA students in Solapur, Maharashtra. A descriptive research design was used, with primary data collected from 100 students through a structured Likert-scale questionnaire. The study evaluates the influence of AI tools on conceptual understanding, problem-solving ability, motivation, engagement, and academic performance. Data were analyzed using percentage and mean score techniques. Findings indicate that AI tools significantly improve conceptual clarity, analytical skills, and learning efficiency. The study concludes that the effective and ethical integration of AI tools in management education enhances teaching effectiveness and overall student learning outcomes.

Keywords: *Artificial Intelligence (AI), Management Education, MBA Students, Learning Outcomes, Student Engagement, Adaptive Learning, Academic Performance*

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1. Introduction

Artificial Intelligence (AI) has emerged as a transformative technology influencing various sectors, including education. In the context of higher education, AI tools are increasingly being adopted to enhance teaching effectiveness, personalize learning experiences, and improve student engagement (Ouyang & Jiao, 2021). Management education, particularly MBA programs, demands the development of analytical thinking, problem-solving abilities, decision-making skills, and practical knowledge. Traditional teaching methods often face challenges in meeting diverse learning needs, which has led to the adoption of AI-driven educational tools. AI tools such as intelligent tutoring systems, learning analytics platforms, chatbots, and adaptive learning systems provide customized learning pathways based on individual student performance. These tools support students in understanding complex management concepts, practicing real-world business scenarios, and receiving instant feedback (Chassignol et al., 2018). The integration of AI in MBA education also aligns with the objectives of outcome-based education and digital transformation in higher education. In India, management institutions are gradually adopting AI-enabled learning platforms to improve academic delivery and student outcomes. However, the extent to which AI tools impact learning outcomes among MBA students remains an area requiring empirical investigation. This study focuses on analyzing the impact of AI tools on learning outcomes of MBA students in Solapur, Maharashtra, thereby contributing to the growing body of literature on AI in management education.

2. Background of Study

The several studies reveal that AI penetration to the different fields and sectors has increased to the great extent due to competitive advantages such as automation, integration, simplification etc. from manufacturing to services (Gaikwad, 2024). Artificial Intelligence (AI) has become a key driver of transformation in higher education, reshaping traditional teaching–learning paradigms into more

dynamic, data-driven, and student-centered approaches. The increasing digitization of education and the rise of smart learning environments have enabled institutions to adopt AI-based tools such as intelligent tutoring systems, virtual assistants, and predictive analytics. These tools facilitate personalized learning by adapting content delivery to individual student needs, thereby improving comprehension and retention (Holmes et al., 2019). On the other hand, lack of AI and digital literacy, poor infrastructure leading to digital stress for the students many times (Gaikwad & Bhattacharya, 2024). In management education, where analytical thinking and decision-making are critical, AI technologies support simulation-based learning and real-time problem-solving experiences. As a result, AI is not only enhancing instructional delivery but also redefining the role of educators from knowledge providers to facilitators of learning. The growing complexity of business environments has increased the demand for MBA graduates who possess strong analytical, strategic, and technological competencies. Traditional teaching methods, including lectures and case-based discussions, often lack the flexibility to cater to diverse learning styles and rapidly changing industry expectations. AI-driven tools address these challenges by offering adaptive learning systems, automated assessments, and interactive platforms that promote active learning and continuous feedback (Luckin et al., 2016). The scope can be extended to augmented reality for the learning management systems (Choudhury et al., 2024). These innovations enable students to engage with real-world business scenarios, enhance critical thinking, and develop practical skills required in modern organizations. Furthermore, AI integration aligns with outcome-based education frameworks, which emphasize measurable learning outcomes and skill development.

In the Indian context, the adoption of AI in higher education is gaining momentum, particularly in professional courses such as MBA programs. Educational institutions are increasingly investing in digital infrastructure and AI-enabled platforms to improve teaching quality and student performance. Government initiatives promoting digital education and technological innovation have further accelerated this shift toward AI integration. However, despite the growing adoption, there is limited empirical research examining the actual impact of AI tools on student learning outcomes in management education. Specifically, regional contexts such as Solapur, Maharashtra, remain underexplored. Therefore, this study seeks to bridge this gap by analyzing how AI tools influence the learning outcomes of MBA students, contributing to both academic research and practical implementation in management education.

3. Scope and Significant Of Study

The scope of the present study is confined to examining the impact of Artificial Intelligence (AI) tools on the learning outcomes of MBA students in Solapur, Maharashtra. It focuses specifically on AI-enabled educational tools such as intelligent tutoring systems, learning management systems, chatbots, and adaptive learning platforms used within management education. The study evaluates key dimensions of learning outcomes, including conceptual understanding, problem-solving ability, student engagement, motivation, and academic performance. The research is limited to MBA students and does not extend to other disciplines, ensuring a focused analysis within the domain of management education. By adopting a descriptive research design and collecting primary data through structured questionnaires, the study provides a localized and context-specific understanding of AI adoption in higher education. The significance of this study lies in its contribution to the emerging field of AI in management education by providing empirical evidence on how AI tools influence student learning outcomes. As educational institutions increasingly integrate digital technologies, there is a growing need to assess their effectiveness in enhancing academic performance and skill development. This study offers valuable insights for educators, academic administrators, and policymakers in understanding the role of AI in improving teaching–learning processes. It also supports the implementation of outcome-based education by highlighting how AI tools can facilitate measurable learning improvements and student-centric approaches (Zawacki-Richter et al., 2019).

The study holds practical significance for management institutions in India, particularly in semi-urban

regions like Solapur, where the adoption of advanced technologies is still evolving. The findings can guide institutions in making informed decisions regarding investment in AI-based educational tools and digital infrastructure. Additionally, the study contributes to the broader discourse on digital transformation in higher education by identifying opportunities and challenges associated with AI integration. It also provides a foundation for future research by addressing the gap in regional studies and encouraging further empirical investigations in similar contexts (Ifenthaler & Yau, 2020).

4. Objectives of the Study

- To study the awareness of AI tools among MBA students
- To analyze the usage of AI tools in the learning process
- To examine the impact of AI tools on MBA students' learning outcomes
- To identify challenges faced by students while using AI tools

5. Review of Literature

The application of Artificial Intelligence (AI) in higher education has been widely examined for its ability to enhance learning effectiveness and student engagement. Research indicates that AI technologies, including machine learning algorithms and intelligent tutoring systems, facilitate personalized learning by adapting instructional content to individual learner needs (Zawacki-Richter et al., 2019). Such systems allow educators to monitor student progress in real time and provide targeted interventions, thereby improving academic outcomes. Additionally, AI-supported learning environments have been found to increase student motivation and participation, as learners receive immediate feedback and customized learning experiences. These developments demonstrate the potential of AI to address the limitations of traditional teaching methodologies.

In management education, AI tools have been increasingly utilized to foster higher-order cognitive skills such as analytical thinking, problem-solving, and decision-making. Studies suggest that simulation-based learning, predictive analytics, and AI-enabled platforms help students engage with real-world business problems, thereby bridging the gap between theoretical knowledge and practical application (Luckin et al., 2016). Moreover, AI-driven chatbots and virtual assistants provide continuous academic support, enabling students to clarify doubts and access learning resources at any time. This enhances the overall learning experience and supports the development of competencies required in dynamic business environments.

Recent studies have also explored the role of learning analytics and adaptive systems in improving student performance and retention in higher education. Learning analytics tools collect and analyze large volumes of student data to identify learning patterns and predict academic outcomes, enabling institutions to design effective instructional strategies (Ifenthaler & Yau, 2020). Furthermore, adaptive learning systems adjust the pace and difficulty of content delivery based on student performance, ensuring a more personalized and efficient learning process. These technologies contribute significantly to improving conceptual understanding and academic achievement among students, particularly in professional programs such as MBA.

Despite the growing body of literature, several researchers emphasize the need for more empirical studies to evaluate the impact of AI tools in specific educational contexts, especially in developing countries like India. Studies highlight challenges such as inadequate digital infrastructure, lack of faculty training, and ethical concerns related to data privacy, which may affect the successful implementation of AI in education (Ouyang & Jiao, 2021). In the Indian higher education system, the adoption of AI is still evolving, and there is limited research focusing on its effectiveness in management education. Therefore, this study aims to address this research gap by examining the impact of AI tools on the learning outcomes of MBA students in Solapur, Maharashtra.

6. Research Methodology

The study adopted a descriptive research design. Primary data were collected from 100 MBA

students in Solapur, Maharashtra, using a structured questionnaire. A five-point Likert scale was used to measure responses related to the use of AI tools and learning outcomes. The collected data were analyzed using percentage analysis and mean score analysis.

7. Data Analysis and Interpretation

Table 1: Descriptive Statistics

Statement	Mean Score
AI tools improve conceptual understanding	4.25
AI tools enhance problem-solving skills	4.10
AI tools increase learning engagement	4.30
AI tools support self-learning	4.35

The analysis of data reveals that AI tools have a strong positive impact on various dimensions of learning outcomes among MBA students. The mean score of 4.25 for the statement “AI tools improve conceptual understanding” indicates that students largely agree that AI-based learning platforms help them grasp complex management concepts more effectively. This suggests that features such as adaptive learning, interactive content, and instant feedback contribute significantly to deeper understanding and knowledge retention. The statement “AI tools enhance problem-solving skills” recorded a mean score of 4.10, reflecting a high level of agreement among respondents. This indicates that AI tools enable students to engage in analytical thinking and practical application of concepts through simulations, case-based learning, and scenario analysis. Although slightly lower than other dimensions, the score still demonstrates that AI tools play a crucial role in developing critical problem-solving abilities required in management education.

The mean score of 4.30 for “AI tools increase learning engagement” highlights that students find AI-enabled platforms more interactive and engaging compared to traditional teaching methods. Features such as gamification, real-time interaction, and personalized content delivery enhance student participation and interest in learning. This increased engagement is essential for maintaining motivation and improving overall academic performance. The highest mean score of 4.35 is observed for the statement “AI tools support self-learning,” indicating that students strongly perceive AI tools as effective in promoting independent learning. AI-driven platforms allow learners to access resources anytime, learn at their own pace, and revisit concepts as needed. This flexibility fosters self-directed learning habits, which are critical for lifelong learning and professional development.

8. Discussion

The study clearly demonstrates that Artificial Intelligence (AI) tools significantly enhance learning outcomes among MBA students. The high mean score for conceptual understanding (Mean = 4.25) indicates that AI-driven platforms facilitate deeper comprehension of complex management concepts through personalized content delivery and interactive learning environments. AI systems enable adaptive instruction, allowing students to learn at their own pace, which improves knowledge retention and cognitive development (Chen et al., 2020). The study also reveals that AI tools positively influence problem-solving skills (Mean = 4.10), which are essential in management education. AI-based simulations and decision-support systems provide students with opportunities to engage in real-time business scenarios, thereby enhancing analytical thinking and strategic decision-making. Although the score is slightly lower compared to other variables, it still reflects the effectiveness of AI in fostering applied learning and critical reasoning skills required in professional environments (Kumar & Sharma, 2022).

The results indicate a high level of student engagement (Mean = 4.30) through AI-enabled learning platforms. Technologies such as gamification, virtual assistants, and interactive dashboards create a dynamic learning experience that encourages active participation. Increased engagement not only improves attention and motivation but also contributes to better academic performance and learning satisfaction among students (Hwang & Tu, 2021). The highest mean score for self-learning support

(Mean = 4.35) highlights the crucial role of AI in promoting independent learning among MBA students. AI tools provide flexible access to learning materials, enabling students to revisit concepts and progress according to their individual needs. This fosters self-regulated learning and lifelong learning habits, which are essential in today's rapidly evolving business environment. Overall, the analysis confirms that AI integration enhances multiple dimensions of learning, contributing to improved academic outcomes and skill development (Bond et al., 2020).

9. Finding of Study

- The study reveals that Artificial Intelligence (AI) tools have a significant and positive impact on the learning outcomes of MBA students. The majority of respondents agreed that AI-enabled platforms enhance conceptual understanding, as reflected by a high mean score of 4.25. This indicates that AI tools help students grasp complex management concepts more effectively through personalized and interactive learning methods.
- The findings also show that AI tools contribute to the development of problem-solving skills, with a mean score of 4.10. Students reported that AI-based simulations, case studies, and analytical tools enable them to apply theoretical knowledge to practical business situations. This demonstrates the role of AI in strengthening analytical thinking and decision-making abilities, which are essential for management professionals.
- Another key finding is the increased level of student engagement, with a mean score of 4.30. AI tools such as chatbots, adaptive learning systems, and gamified platforms make the learning process more interactive and engaging. This leads to higher participation, improved concentration, and better academic performance among MBA students.
- The highest mean score of 4.35 was observed for self-learning support, indicating that AI tools strongly promote independent and self-paced learning. Students are able to access learning resources anytime, revisit difficult concepts, and learn according to their own pace and convenience. The study concludes that AI tools significantly enhance conceptual clarity, engagement, problem-solving skills, and self-learning, thereby improving the overall academic performance of MBA students.

10. Conclusion

The study concludes that the integration of Artificial Intelligence (AI) tools in management education has a substantial and positive impact on the learning outcomes of MBA students. AI-enabled platforms have proven effective in enhancing conceptual understanding, improving problem-solving abilities, increasing student engagement, and promoting self-directed learning. The findings clearly indicate that AI tools facilitate a more personalized, interactive, and efficient learning environment compared to traditional teaching methods. The adoption of AI in MBA programs supports the development of critical skills required in the modern business landscape, such as analytical thinking, decision-making, and adaptability. By enabling real-time feedback, customized learning paths, and practical exposure through simulations, AI tools help bridge the gap between theoretical knowledge and real-world application. This contributes to improved academic performance and better preparedness of students for professional challenges. The study also implies that the successful implementation of AI in education requires adequate digital infrastructure, faculty training, and ethical considerations related to data usage and privacy. Institutions must adopt a strategic approach to integrate AI tools effectively within the curriculum. Overall, the study highlights that AI-driven education is a valuable advancement in management learning and holds significant potential for transforming higher education, particularly in emerging regions like Solapur, Maharashtra.

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