JOURNAL OF TECHNOLOGY MANAGEMENT AND TECHNOPRENEURSHIP

The Impact of AI-Enabled Teaching Materials on Student Understanding in Islamic Financial Planning and Wealth Management

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Abstract

This study investigates the effects of AI-enabled teaching materials on student understanding in the course of Islamic Financial Planning and Wealth Management. By comparing pre- and post-course evaluations, we assess the improvement in students' comprehension and satisfaction. The results indicate that AI technologies significantly enhance learning outcomes, suggesting a broader potential for AI integration in educational curricula.

Keywords: AI in education; Islamic financial planning; student understanding; collaborative learning; MOOCs

1. Introduction

The integration of Artificial Intelligence (AI) in education has revolutionized traditional teaching methodologies, offering personalized and interactive learning experiences. This study focuses on the course "Islamic Financial Planning and Wealth Management" to evaluate the impact of AI-enabled teaching materials on students' understanding and satisfaction. The objective is to determine the effectiveness of AI tools in enhancing educational outcomes and to explore the potential for broader application in academic settings.

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2. Literature Review

AI technologies have been increasingly adopted in various educational contexts, providing benefits such as personalized learning paths, instant feedback, and enhanced engagement. This section reviews relevant literature on the impact of AI in education, collaborative learning, and specific applications in financial education.

2.1. AI in education

AI's role in education has grown significantly, with technologies such as adaptive learning systems, intelligent tutoring systems, and automated grading enhancing the learning experience (Chen et al., 2020). AI enables personalized learning by adapting content and pacing to individual student needs, thereby improving learning efficiency and outcomes (Zawacki-Richter et al., 2019). For instance, AI-powered platforms like Khan Academy and Coursera use algorithms to provide personalized feedback and suggest tailored learning resources based on student performance (Luckin et al., 2016).

2.2. Collaborative learning and AI

Collaborative learning, where students work together to solve problems and learn from each other, is a critical component of modern education. AI technologies can facilitate this by providing tools for communication, resource sharing, and collaborative projects (Dillenbourg et al., 2018). Studies have shown that AI can enhance collaborative learning by tracking group dynamics, offering real-time feedback, and promoting active participation (Roschelle et al., 2013). AI-supported peer interaction tools, such as discussion forums and collaborative workspaces, help students engage more deeply with the material and learn from diverse perspectives (Soller, 2001).

2.3. AI in financial education

The application of AI in financial education, particularly in complex fields like Islamic financial planning, is relatively new but promising. AI can help simplify intricate financial concepts through interactive simulations and personalized learning modules (Mistry & Banerjee, 2019). In Islamic financial planning, where principles and practices differ significantly from conventional finance, AI tools can provide tailored instruction that respects and incorporates religious and ethical considerations (Billah, 2019). This personalized approach can significantly enhance understanding and retention of complex topics.

2.4. AI in MOOCs

Massive Open Online Courses (MOOCs) have leveraged AI to improve accessibility and learning outcomes for a global audience. AI technologies in MOOCs provide personalized learning experiences, facilitate peer interactions, and offer scalable solutions for large enrollments (Daradoumis et al., 2013). Studies have shown that AI in MOOCs can enhance student engagement and satisfaction, leading to better educational outcomes (Hone & El Said, 2016). The ability of AI to provide instant feedback and adaptive

learning paths is particularly valuable in MOOCs, where instructor-student interaction is limited (Kizilcec et al., 2017).

2.5. Gaps in the literature

While there is extensive research on the benefits of AI in education, studies specifically focusing on its impact on Islamic financial education are limited. This study aims to fill this gap by providing empirical evidence on the effectiveness of AI-enabled teaching materials in the context of Islamic Financial Planning and Wealth Management. By comparing pre- and post-course evaluations, this study offers insights into how AI can enhance understanding and satisfaction in this specialized field.

3. Methodology

3.1. Participants

The participants were students enrolled in the "Islamic Financial Planning and Wealth Management" course, divided into two groups (D2BA2792A and D2BA2792B). The survey included responses from 50 students, with demographic data such as gender, age, and previous education level collected.

3.2. Data collection

Data were collected through a pre-course survey assessing students' understanding of Islamic financial planning and wealth management, followed by a post-course survey evaluating their comprehension after using AI-enabled teaching materials. The surveys also measured student satisfaction and the perceived impact of AI-supported peer interaction and MOOCs.

3.3. Data analysis

The data were analyzed using descriptive and inferential statistics to compare students' understanding before and after the course. Descriptive statistics summarized demographic information and survey responses. Paired t-tests were used to evaluate the significance of improvements in understanding and satisfaction levels. Additionally, correlation analysis was conducted to examine the relationship between AI-supported peer interaction and overall satisfaction.

4. Results

4.1. Pre-course understanding

Before the course, the majority of students rated their understanding of Islamic financial planning and wealth management as low or very low. Only a small percentage had a moderate understanding, and none rated their comprehension as high.

4.2. Post-course evaluation

Post-course evaluations showed a significant improvement in students' understanding. The majority of students rated their comprehension as moderate to high. The paired t-test results indicated that the improvement was statistically significant ($p < 0.01$).

4.3. Satisfaction with learning experience

Students expressed high levels of satisfaction with the learning experience after using AI-enabled teaching materials. The majority of students were either satisfied or very satisfied, with only a small percentage expressing neutrality or dissatisfaction.

4.4. Impact of AI technologies

Students reported that AI-supported peer interaction and AI technologies in MOOCs positively impacted their learning. The majority of students agreed that these tools improved their collaborative learning and understanding of course materials. Correlation analysis revealed a strong positive relationship between AI-supported peer interaction and overall satisfaction ($r = 0.72$, $p < 0.01$).

4.5. Detailed statistical analysis

Table 1. Detailed statistical analysis results of pre-course and post-course

Measure	Pre-course mean (SD)	Post-course mean (SD)	t-value	p-value
Understanding level	2.1 (0.8)	4.3 (0.6)	12.5	<0.01
Satisfaction level	N/A	4.6 (0.5)	N/A	N/A
AI-supported peer interaction impact	N/A	4.2 (0.7)	N/A	N/A
AI technologies in MOOCs impact	N/A	4.5 (0.5)	N/A	N/A

5. Discussion of findings

The results of this study demonstrate the significant positive impact of AI-enabled teaching materials on students' understanding and satisfaction in the course of Islamic Financial Planning and Wealth Management. This section explores the implications of these findings in detail and discusses the potential challenges and opportunities associated with integrating AI technologies into educational curricula.

5.1. Enhanced understanding and comprehension

The marked improvement in students' understanding of Islamic financial planning and wealth management post-course underscores the effectiveness of AI-enabled teaching materials. AI technologies, through adaptive learning systems, personalized feedback, and interactive content, provide a tailored learning experience that caters to individual student needs. This personalized approach likely contributed to the significant increase in comprehension levels observed in this study.

The ability of AI to identify areas where students struggle and to offer targeted interventions is a key factor in enhancing understanding. By continuously adapting to student performance, AI tools can provide a more efficient and effective learning process compared to traditional methods. This finding aligns with previous research suggesting that personalized learning facilitated by AI can lead to improved academic outcomes (Chen et al., 2020; Huang & Rust, 2021).

5.2. Increased student engagement and satisfaction

The high levels of student satisfaction reported in the post-course surveys indicate that AI-enabled teaching materials positively impact the overall learning experience. The interactive nature of AI tools, which often include elements such as gamification, real-time feedback, and multimedia content, can make learning more engaging and enjoyable. This increased engagement is crucial for maintaining student motivation and interest, particularly in complex subjects like Islamic financial planning.

Moreover, the positive impact of AI-supported peer interaction highlights the role of collaborative learning in enhancing student satisfaction. AI technologies can facilitate peer-to-peer learning by enabling students to collaborate on projects, participate in discussions, and share resources. This collaborative approach not only improves understanding but also fosters a sense of community and support among students.

5.3. Facilitating collaborative learning

The findings of this study emphasize the potential of AI to facilitate collaborative learning. Students reported that AI-supported peer interaction improved their understanding of course materials, suggesting that collaborative learning is enhanced by AI tools. AI technologies can support group work by providing platforms for communication and collaboration, tracking group progress, and offering insights into group dynamics.

Collaborative learning is particularly beneficial in subjects like Islamic financial planning, where complex concepts and real-world applications require discussion and multiple perspectives. AI tools can help manage

and streamline these collaborative efforts, ensuring that all students actively participate and benefit from group activities.

5.4. Addressing educational disparities

One of the significant advantages of AI-enabled teaching materials is their scalability and accessibility. AI technologies can provide high-quality educational resources to students regardless of their geographical location or socioeconomic background. This can help address educational disparities by ensuring that all students have access to the same level of instruction and support.

For instance, students in remote or underserved areas can benefit from AI-driven MOOCs that offer comprehensive coverage of subjects like Islamic financial planning. The ability of AI to provide personalized feedback and support ensures that these students receive the same attention and assistance as their peers in more advantaged settings.

5.5. Potential challenges and considerations

While the benefits of AI in education are evident, several challenges must be addressed to ensure the successful integration of AI technologies:

1. Technical Infrastructure: Implementing AI-enabled teaching materials requires robust technical infrastructure, including reliable internet access and adequate computing resources. Educational institutions must invest in the necessary technology to support AI integration.
2. Data Privacy and Security: The use of AI involves the collection and analysis of large amounts of student data. Ensuring data privacy and security is crucial to protect student information and maintain trust.
3. Teacher Training: Educators need training to effectively use AI tools and integrate them into their teaching practices. Professional development programs should focus on building educators' skills in using AI technologies to enhance instruction.
4. Equity and Inclusion: While AI has the potential to address educational disparities, it is essential to ensure that AI technologies are accessible to all students, including those with disabilities and those from diverse backgrounds.

5.6. Future research directions

Future research should explore the long-term impact of AI-enabled teaching materials on student learning outcomes. Longitudinal studies can provide insights into the sustained benefits and potential challenges of AI integration. Additionally, research should examine the effectiveness of AI in different educational contexts and subjects to identify best practices and scalable solutions.

5.7. Recommendations

Based on the findings and discussion, the following recommendations are proposed:

1. Further Integration of AI: Educational institutions should continue to explore and integrate AI technologies into their curricula to enhance learning outcomes.
2. Continuous Improvement and Feedback: AI teaching materials should be regularly updated based on student feedback and advancements in AI technology.
3. Training for Educators: Professional development programs should focus on training educators to effectively use AI tools in their teaching.
4. Inclusive and Equitable Access: Efforts should be made to ensure that AI technologies are accessible to all students, including those with disabilities and those from diverse backgrounds.

6. Conclusion

This study demonstrates the positive impact of AI-enabled teaching materials on student understanding and satisfaction in Islamic Financial Planning and Wealth Management. The analysis revealed significant improvements in students' comprehension and overall learning experience, highlighting the potential of AI technologies in educational settings.

6.1. Summary of findings

The pre-course survey indicated that most students had a low or very low understanding of Islamic financial planning and wealth management, with limited prior formal education or training in the subject. However, the post-course evaluations showed substantial improvements, with the majority of students rating their understanding as moderate to high. Statistical analysis confirmed that these improvements were significant.

Additionally, students expressed high levels of satisfaction with the AI-enabled learning experience. The positive responses regarding AI-supported peer interaction and the use of AI technologies in MOOCs underscored the role of AI in facilitating collaborative learning and enhancing comprehension of complex subjects.

6.2. Implications for education

The findings of this study have several important implications for the future of education:

1. Enhanced Learning Outcomes: The significant improvement in student understanding demonstrates that AI-enabled teaching materials can effectively enhance learning outcomes. This suggests that AI technologies should be more widely adopted in educational curricula to support student learning.
2. Increased Student Engagement: High satisfaction levels and positive feedback on AI-supported peer interaction indicate that AI tools can increase student engagement. By making learning more interactive and personalized, AI can help maintain student interest and motivation.
3. Facilitation of Collaborative Learning: The study highlights the potential of AI to facilitate collaborative learning. AI-supported peer interaction can improve students' understanding by encouraging collaboration and knowledge sharing among peers.

4. Scalability and Accessibility: AI-enabled teaching materials can be easily scaled and made accessible to a broader audience. This can help address educational disparities by providing high-quality learning resources to students regardless of their location or background.

6.3. Recommendations for future research practice

Based on the findings of this study, several recommendations can be made for future research and practice:

1. Broader Integration of AI Technologies: Educational institutions should consider integrating AI technologies into a wider range of courses and subjects. Further research is needed to explore the impact of AI on different academic disciplines and student demographics.
2. Continuous Improvement and Feedback: AI teaching materials should be continuously updated and improved based on student feedback. This will ensure that the materials remain relevant and effective in addressing student needs.
3. Training for Educators: Educators should receive training on how to effectively use AI technologies to enhance their teaching. This includes understanding the capabilities of AI tools, designing AI-integrated lesson plans, and leveraging AI for personalized student support.
4. Longitudinal Studies: Future research should include longitudinal studies to assess the long-term impact of AI-enabled teaching materials on student learning outcomes. This will provide deeper insights into the sustained benefits and potential challenges of AI in education.

In conclusion, this study provides compelling evidence that AI-enabled teaching materials can significantly enhance student understanding and satisfaction in Islamic Financial Planning and Wealth Management. The positive impact on learning outcomes and student engagement highlights the transformative potential of AI in education. By embracing AI technologies, educational institutions can create more effective, engaging, and equitable learning environments that cater to the diverse needs of students. Future research and continuous innovation will be key to fully realizing the benefits of AI in education and ensuring its successful integration into academic curricula.

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