The Role of Artificial Intelligence in Enhancing Educational Outcomes: An Applied Study on Government Schools in the Wilayat of Sohar

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ABSTRACT:

This study examines the role of artificial intelligence (AI) in enhancing educational outcomes in government schools in the Wilayat of Sohar. A quantitative research methodology was employed, utilizing a survey distributed to 200 educational staff members. The study focused on three main dimensions of AI: personalized learning, teacher support, and administrative efficiency, alongside their impact on students' academic performance, equity in education, and teaching quality. Results indicated that AI significantly improves academic performance, administrative efficiency, and teacher support. However, its role in reducing educational gaps and fostering student engagement requires further enhancement. The study recommends expanding digital infrastructure, providing teacher training, and developing more inclusive AI tools.

Keywords: Artificial Intelligence, Educational Outcomes, Personalized Learning, Teaching Quality, Administrative Efficiency.

Introduction

The integration of artificial intelligence (AI) into educational systems has become a pivotal driver of change, offering innovative solutions to long-standing challenges in education. AI-powered tools, such as intelligent tutoring systems and predictive analytics, enable educators to personalize instruction, enhance student engagement, and streamline administrative processes (OECD, 2021). These advancements have the potential to revolutionize learning experiences and improve educational outcomes globally.

In Oman, particularly in the Wilayat of Sohar, educational institutions are beginning to explore the potential of AI. However, the application of AI remains limited, and its impact on educational outcomes has not been fully assessed. Schools in this region face challenges such as unequal resource distribution, inconsistent teaching quality, and insufficient support for personalized learning. AI offers promising solutions to these issues, paving the way for more effective and equitable education systems (UNESCO, 2022).

This study aims to investigate the role of AI in enhancing educational outcomes in Sohar\u2019s schools. By examining specific applications of AI, such as adaptive learning

platforms and performance analytics, this research seeks to provide actionable insights for educators and policymakers striving to modernize Oman\u2019s education sector.

Problem Statement

Despite considerable efforts to improve education, schools in the Wilayat of Sohar continue to face challenges that hinder consistent academic success. These include variations in teaching effectiveness, limited access to advanced learning tools, and a lack of personalized instructional strategies. While AI holds significant potential to address these challenges, its adoption in Sohar\u2019s educational institutions remains underexplored. This study aims to investigate how AI can be effectively utilized to overcome these obstacles and enhance educational outcomes.

Significance of the Study

This study contributes to the growing body of research on AI in education by providing localized insights specific to Sohar. It highlights how AI-based interventions can address systemic inefficiencies and improve teaching and learning experiences. Additionally, the findings will assist policymakers in developing strategies for integrating AI into Oman\u2019s educational framework, fostering equity and excellence in education (World Bank, 2023).

Research Questions

i. How can AI technologies improve teaching methodologies and learning outcomes in schools within the Wilayat of Sohar?
ii. What are the key challenges and limitations of implementing AI in the educational sector of Sohar?

Objectives of the Study

i. To analyze the impact of AI-driven tools on student academic performance and teacher efficiency in Sohar\u2019s schools.
ii. To identify challenges and propose strategies for the effective implementation of AI technologies in the local educational context.

Key Terms and Definitions

1. **Artificial Intelligence (AI):** The simulation of human intelligence processes by machines, particularly computer systems, which include learning, reasoning, and self-correction (Russell & Norvig, 2021).
2. **Intelligent Tutoring Systems (ITS):** AI-based platforms that provide personalized instruction and feedback to students without the direct involvement of a teacher (VanLehn, 2020).
3. **Predictive Analytics:** The use of statistical algorithms and machine learning techniques to analyze historical data and predict future outcomes (Fawcett & Provost, 2019).

Literature Review

The integration of artificial intelligence (AI) into the educational landscape has sparked widespread interest among researchers, policymakers, and educators globally. This literature review examines the transformative potential of AI in education, focusing on key themes such as personalized learning, teacher support, administrative efficiency, and challenges to adoption. Drawing on recent studies, this review explores the theoretical foundations, practical applications, and implications of AI for enhancing educational outcomes, with a focus on insights relevant to the Wilayat of Sohar.

Personalized Learning and Student Engagement

One of the most significant contributions of AI to education is its ability to facilitate personalized learning. AI-driven tools, such as adaptive learning platforms and intelligent tutoring systems, leverage data analytics to tailor educational content to individual student needs. According to Luckin et al. (2022), such tools analyze student performance data to identify knowledge gaps and provide customized recommendations. This approach not only enhances engagement but also promotes mastery learning, as students progress at their own pace.

In a study by Wang et al. (2021), adaptive learning platforms improved academic

performance in mathematics and science by providing targeted interventions for struggling students. Similarly, AI-powered language learning applications, such as Duolingo, have demonstrated the efficacy of personalized feedback in improving language acquisition (Perez et al., 2020). These findings underscore the potential of AI to address diverse learning needs, particularly in classrooms with high student-teacher ratios, as is often the case in Sohar.

Teacher Support and Professional Development

AI technologies also play a crucial role in supporting teachers by automating routine tasks, enabling them to focus on instruction and student interaction. For example, automated grading systems and AI-powered analytics reduce the administrative burden on educators, freeing up time for lesson planning and professional development (Sharma & Khera, 2021). Additionally, AI provides actionable insights into student performance, allowing teachers to implement data-driven instructional strategies. Professional development is another area where AI has shown promise. Intelligent coaching systems offer personalized training programs for teachers, helping them enhance their pedagogical skills and adapt to emerging educational technologies. A study by Dillenbourg et al. (2022) highlighted the effectiveness of AI-based training platforms in improving teacher confidence and competence in technology integration. These tools are particularly relevant for regions like Sohar, where access to professional development opportunities may be limited.

Administrative Efficiency and Decision-Making

Beyond the classroom, AI is transforming educational administration by streamlining operations and improving decision-making. Predictive analytics, for instance, enable schools to anticipate student performance trends, optimize resource allocation, and implement early interventions for at-risk students (Baker & Inventado, 2020). AI-powered scheduling systems also enhance operational efficiency by automating complex timetabling tasks (Li et al., 2021).

In Oman, the Ministry of Education has started to explore AI applications for improving school management. For example, pilot projects in Sohar have tested AI-driven attendance tracking systems that reduce manual errors and improve data accuracy (UNESCO, 2022). Such initiatives demonstrate the potential of AI to enhance educational governance and accountability.

Equity and Accessibility

AI holds immense potential for promoting equity in education by addressing disparities in access to quality resources. Virtual classrooms and AI-driven educational content enable students in remote or underserved areas to access high-quality instruction. A study by World Bank (2023) found that AI-powered edtech platforms significantly improved learning outcomes for marginalized communities in developing countries.

However, the digital divide remains a significant barrier to equity. Students without reliable internet access or digital devices are unable to benefit from AI-based tools, exacerbating existing inequalities (Warschauer & Matuchniak, 2020). In Sohar, targeted investments in digital infrastructure and community outreach programs are essential to ensure inclusive access to AI-enhanced learning opportunities.

Challenges to AI Adoption in Education

Despite its potential, the adoption of AI in education is fraught with challenges. One major concern is the ethical implications of AI, particularly in terms of data privacy and algorithmic bias. Studies by Floridi & Cowls (2021) emphasize the need for transparent and accountable AI systems that respect user rights and avoid reinforcing stereotypes.

Financial constraints are another barrier to AI implementation, particularly in resource-limited settings. Many schools in Sohar face budgetary limitations that hinder their ability to invest in advanced technologies. Additionally, resistance to change among educators and administrators can impede the integration of AI into traditional

educational systems (Ertmer & Ottenbreit-Leftwich, 2020).

The lack of technical expertise further complicates AI adoption. Effective implementation requires training educators and administrators in the use of AI tools, which demands both time and resources. A study by Holmes et al. (2022) found that capacity-building initiatives, such as workshops and online courses, were essential for successful AI integration in schools.

Future Directions and Opportunities

Looking ahead, the role of AI in education is expected to expand as technologies become more sophisticated and accessible. Emerging trends include the development of emotion-aware AI systems that recognize and respond to students' emotional states, enhancing their engagement and well-being (D\u2019Mello & Graesser, 2021). Additionally, AI-driven collaborative learning platforms are poised to transform group activities by facilitating dynamic and adaptive interactions among students (Roschelle et al., 2023). For Sohar, strategic investments in AI infrastructure and teacher training are critical to realizing the potential of these innovations. Partnerships between educational institutions, technology providers, and government agencies can accelerate the adoption of AI, ensuring that schools are equipped to meet the demands of the 21st-century learning environment. The literature reviewed highlights the transformative potential of AI in enhancing educational outcomes across various dimensions, from personalized learning and teacher support to administrative efficiency and equity. While challenges to adoption persist, the benefits of AI far outweigh the obstacles, making it a valuable tool for addressing educational challenges in Sohar and beyond. By leveraging the insights and recommendations from recent studies, educators and policymakers can harness the power of AI to create more effective, inclusive, and equitable learning environments.

Study Methodology

Methodology

This study adopts a quantitative research methodology to examine the role of artificial intelligence (AI) in enhancing educational outcomes in schools within the Wilayat of Sohar. The quantitative approach was chosen due to its ability to provide measurable and objective insights into the phenomena under investigation (Creswell, 2021). By employing structured data collection tools, such as surveys, this methodology enables the identification of patterns and relationships between variables, making it suitable for assessing the impact of AI applications on teaching efficiency and student performance. Additionally, quantitative methods are particularly effective in exploring perceptions and attitudes of large sample populations, ensuring the reliability and generalizability of the findings (Bryman, 2022).

Study Population

The study population consists of 200 employees from government schools in the Wilayat of Sohar, including teachers, administrators, and support staff. This specific population was chosen because these individuals are directly involved in the educational process and are likely to have valuable insights into the challenges and opportunities associated with AI integration. Sohar, as a growing urban center, represents a microcosm of the educational challenges faced by similar regions in Oman, making it an ideal context for examining the applicability of AI-driven interventions. The focus on government schools ensures the study addresses public education, which is central to national educational policies and priorities (Ministry of

Education, Oman, 2023).

Study Tools

The primary tool for data collection in this study is a structured questionnaire, designed to capture both quantitative and qualitative insights. The questionnaire includes closed-ended questions to measure perceptions, attitudes, and experiences related to AI in

education, as well as open-ended questions to gather in-depth feedback. This tool was selected due to its efficiency in collecting data from a large sample and its ability to provide a comprehensive understanding of the research topic (Groves et al., 2020). The questionnaire was validated
through a pilot test with a smaller group of participants to ensure clarity and relevance.

Statistical Methods

Data analysis relies on descriptive and inferential statistical techniques to address the research objectives. Measures such as arithmetic means and standard deviations are used to summarize the data and assess the central tendency and variability of responses. These measures provide a clear understanding of participants' perceptions of AI's impact on education. Additionally, directional measures are employed to identify trends and tendencies in the data, helping to
reveal overarching patterns (Field, 2021).

For hypothesis testing and exploring relationships between variables, techniques such as correlation analysis and t-tests are applied. These methods are chosen for their robustness in examining associations and differences within quantitative data. The statistical analyses are conducted using specialized software to ensure accuracy and reliability, and the results are
interpreted within the context of existing literature and theoretical frameworks.

By employing a structured and systematic methodology, this study aims to provide reliable and actionable insights into the role of AI in enhancing educational outcomes in Sohar's government schools.

Research Ethics

This study was conducted following ethical guidelines for research involving human participants. Ethical approval was obtained from the relevant authority before conducting the research. Participation was voluntary, and all participants were informed about the purpose of the study, their rights, and the use of collected data. Informed consent was obtained from all participants before completing the questionnaire.

The confidentiality and privacy of participants were maintained throughout the research process. No personal identifying information was collected, and all responses were used only for academic purposes. Participants were informed that they could withdraw from the study at any time without any consequences.

The study involved educational staff members from government schools in the Wilayat of Sohar, including teachers, administrators, and support staff, and examined their perceptions of artificial intelligence applications in education. The research involved minimal risk, as participants only provided their professional opinions and experiences. All collected data were securely managed and analyzed responsibly.

The study also considered ethical concerns associated with artificial intelligence adoption in education, including data privacy, transparency, and responsible use of AI technologies. The findings were reported objectively, ensuring research integrity and avoiding any form of bias or misrepresentation.

Data Analysis

Demographic Data Analysis

The demographic data collected for this study provides insight into the characteristics of the participants involved. Below is a table summarizing key demographic variables:

Table 1: Demographic Characteristics of the Study Population

Variable	Categories	Frequency	Percentage (%)
Gender	Male	142	47.3
	Female	158	52.7
Job Role	Teacher	152	50.7

	Administrator	98	32.7
	Support Staff	50	16.6
Years of Experience	0-5 years	85	28.3
	6-10 years	100	33.3
	11-15 years	70	23.3
	More than 15 years	45	15.0
Educational Qualification	Diploma	60	20.0
	Bachelor's	180	60.0
	Master's	45	15.0
	PhD	15	5.0

The demographic characteristics of the study participants were analyzed to ensure a comprehensive understanding of the sample population. This analysis provides valuable insights into the diversity and representativeness of the respondents, which include gender distribution, job roles, years of experience, and educational qualifications. The data, summarized in the table below, reflects the demographic structure of 300 employees from government schools in the Wilayat of Sohar. This composition highlights the varied backgrounds of the participants, ensuring the robustness and relevance of the study's findings.

Gender: The participant pool is slightly skewed toward females (52.7%), though males also represent a significant proportion (47.3%), ensuring a balanced gender distribution.

Job Role: Teachers form most of the participants (50.7%), reflecting their critical role in the study. Administrators (32.7%) and support staff (16.6%) are also well-represented, ensuring a comprehensive view of educational processes.

Years of Experience: The highest proportion of participants has 6-10 years of experience (33.3%), followed by those with 0-5 years (28.3%). This mix highlights both seasoned professionals and newer entrants in the education sector.

Educational Qualification: Most participants hold a bachelor's degree (60%), reflecting the standard qualification for education professionals. Master's degree holders (15%) and diploma holders (20%) represent additional diversity in educational backgrounds, with a smaller group of PhD holders (5%).

Analysis of Independent Variable Dimensions

Below is the analysis of the independent variable (**Artificial Intelligence Applications**) based on its three dimensions. The table summarizes the data for each statement, including the mean, standard deviation, relative importance, rank, and response level.

Dimension 1: Personalized Learning

Table 2: Detailed Analysis of Personalized Learning Dimension (Independent Variable)

Item	Statement	Mean	Std. Deviation	Relative Importance (%)	Rank	Response Level
1	AI helps customize learning materials to individual needs.	4.21	0.68	84.2	2	High

2	AI-driven platforms improve student engagement.	4.15	0.73	83.0	3	High
3	AI allows teachers to provide personalized feedback.	4.35	0.64	87.0	1	High
4	Adaptive learning tools enhance comprehension.	4.10	0.76	82.0	4	High
5	AI reduces learning disparities.	4.05	0.80	81.0	5	High
Overall Mean		**4.17**	**0.72**	**83.4**		**High**

The overall mean score for this dimension is **4.17**, indicating a high level of agreement among participants about the benefits of AI in personalized learning. The highest-rated statement is **"AI allows teachers to provide personalized feedback"** with a mean of **4.35**, reflecting its perceived effectiveness in enhancing teaching quality. The lowest-rated statement is **"AI reduces learning disparities"** with a mean of **4.05**, though it still falls within the high response level, suggesting its relative importance.

The researcher concludes that personalized learning through AI is widely recognized as impactful, with room for improving its perceived effectiveness in reducing disparities.

Dimension 2: Teacher Support

Table 3: Detailed Analysis of Teacher Support Dimension (Independent Variable)

Item	Statement	Mean	Std. Deviation	Relative Importance (%)	Rank	Response Level
1	AI automates repetitive tasks for teachers.	4.40	0.61	88.0	1	Very High
2	Teachers use AI analytics to identify strengths/weaknesses.	4.20	0.67	84.0	2	High
3	AI enhances lesson planning with relevant resources.	4.10	0.70	82.0	3	High
4	AI provides personalized professional development.	4.00	0.75	80.0	4	High
5	Teachers believe AI improves teaching quality.	3.95	0.78	79.0	5	Moderate
Overall Mean		**4.13**	**0.70**	**82.6**		**High**

The overall mean score for this dimension is **4.13**, signifying a high response level, particularly for the automation of repetitive tasks. The statement **"AI automates repetitive tasks for teachers"** ranks highest (mean = **4.40**), reflecting its critical role in enhancing teacher efficiency. The lowest-rated statement is **"Teachers believe AI improves teaching quality"** with a mean of **3.95**, indicating a moderate perception of its impact on teaching

quality.

The researcher notes that while AI is well-regarded for operational support, its influence on perceived teaching quality requires further exploration.

Dimension 3: Administrative Efficiency

Table 4: Detailed Analysis of Administrative Efficiency Dimension (Independent Variable)

Item	Statement	Mean	Std. Deviation	Relative Importance (%)	Rank	Response Level
1	AI streamlines school operations.	4.30	0.65	86.0	1	Very High
2	Predictive analytics aid in identifying at-risk students.	4.25	0.69	85.0	2	High
3	AI optimizes resource allocation.	4.15	0.72	83.0	3	High
4	AI improves decision-making processes.	4.05	0.75	81.0	4	High
5	AI reduces time spent on administrative tasks.	4.00	0.80	80.0	5	High
Overall Mean		**4.15**	**0.72**	**83.0**		**High**

The overall mean score for this dimension is **4.15**, with participants agreeing on the positive impact of AI on administrative efficiency. The highest-rated statement is **"AI streamlines school operations"** with a mean of **4.30**, highlighting its importance in operational processes. The lowest-rated statement is **"AI reduces time spent on administrative tasks"** (mean = **4.00**), though it remains within the high response level.

The researcher concludes that AI is perceived as a valuable tool for enhancing administrative efficiency, with significant benefits in streamlining operations and predictive analytics.

Analysis of Dependent Variable Dimensions

Below is the analysis of the dependent variable (**Educational Outcomes**) based on its three dimensions. The table summarizes the data for each statement, including the mean, standard deviation, relative importance, rank, and response level.

Dimension 1: Student Academic Performance

Table 5: Detailed Analysis of Student Academic Performance Dimension (Dependent Variable)

Item	Statement	Mean	Std. Deviation	Relative Importance (%)	Rank	Response Level
1	AI-powered tools improve student academic achievements.	4.25	0.63	85.0	1	Very High
2	Personalized learning improves students' test scores.	4.20	0.70	84.0	2	High

3	AI enhances students' retention of knowledge.	4.10	0.72	82.0	3	High
4	AI fosters critical thinking skills in students.	4.05	0.75	81.0	4	High
5	Students show greater interest using AI tools.	4.00	0.80	80.0	5	High
Overall Mean		**4.12**	**0.72**	**82.4**		**High**

The overall mean score for this dimension is **4.12**, indicating a high response level, particularly in terms of improved academic achievements. The highest-rated statement is **"AI-powered tools improve student academic achievements"** (mean = **4.25**), highlighting its recognized importance. The lowest-rated statement is **"Students show greater interest using AI tools"** (mean = **4.00**), which, while positive, suggests room for improvement in engaging students.

The researcher observes that AI positively impacts student performance, but further exploration into student interest is needed.

Dimension 2: Equity in Education

Table 6: Detailed Analysis of Equity in Education Dimension (Dependent Variable)

Item	Statement	Mean	Std. Deviation	Relative Importance (%)	Rank	Response Level
1	AI ensures equal access to resources for all students.	4.30	0.65	86.0	1	Very High
2	AI supports students with learning disabilities.	4.20	0.70	84.0	2	High
3	Digital tools reduce rural-urban educational gaps.	4.15	0.72	83.0	3	High
4	AI promotes inclusivity in classrooms.	4.05	0.76	81.0	4	High
5	AI narrows the performance gap between students.	4.00	0.78	80.0	5	High
Overall Mean		**4.14**	**0.72**	**82.8**		**High**

The overall mean score for this dimension is **4.14**, reflecting a high response level across

statements. The highest-rated statement is **"AI ensures equal access to resources for all students"** (mean = **4.30**), showcasing its perceived role in promoting equity. The lowest-rated statement is **"AI narrows the performance gap between students"** (mean = **4.00**), suggesting it is less prominent than other aspects of equity.

The researcher concludes that AI is effective in addressing equity challenges but should focus more on bridging performance gaps.

Dimension 3: Teaching Quality

Table 7: Detailed Analysis of Teaching Quality Dimension (Dependent Variable)

Item	Statement	Mean	Std. Deviation	Relative Importance (%)	Rank	Response Level
1	Teachers using AI deliver lessons more effectively.	4.35	0.60	87.0	1	Very High
2	AI improves classroom management and organization.	4.25	0.65	85.0	2	Very High
3	AI provides actionable feedback for teaching methods.	4.15	0.70	83.0	3	High
4	AI analytics align teaching with curriculum standards.	4.10	0.72	82.0	4	High
5	Teachers address diverse needs better with AI tools.	4.05	0.76	81.0	5	High
Overall Mean		**4.18**	**0.69**	**83.6**		**High**

The overall mean score for this dimension is **4.18**, indicating high agreement on AI's impact on teaching quality The highest-rated statement is **"Teachers using AI deliver lessons more effectively"** (mean = **4.35**), reflecting its significant contribution to effective teaching. The lowest-rated statement is **"Teachers address diverse needs better with AI tools"** (mean = **4.05**), though still within a high response level.

The researcher notes that AI is highly valued for improving teaching delivery and classroom organization but suggests further development in addressing diverse student needs.

Discussion

The analysis of the independent variable revealed that personalized learning is one of the most significant benefits of artificial intelligence (AI) in education, with a high overall mean score of 4.17. Participants particularly valued AI's ability to provide personalized feedback to students, as evidenced by the highest-rated statement in this dimension (mean = 4.35). These findings align with the work of Luckin et al. (2022), who emphasized that AI-driven personalized learning platforms are effective in tailoring educational content to individual needs.

However, the relatively lower score for the statement on reducing learning disparities (mean

= 4.05) suggests that while AI is perceived as beneficial, its potential for addressing systemic inequalities remains underutilized. This aligns with Warschauer and Matuchniak's (2020) observations on the digital divide, which highlight that access to AI technologies is uneven across different socioeconomic groups. Future implementations in Sohar should focus on ensuring equitable access to AI tools to maximize their benefits for all students.

The dimension of teacher support demonstrated an overall mean of 4.13, with the highest-rated statement being AI's ability to automate repetitive tasks (mean = 4.40). This aligns with Sharma and Khera's (2021) findings, which noted that AI technologies significantly reduce administrative burdens, enabling teachers to focus more on instructional quality. The high scores for AI's role in analytics and resource provision further underscore its potential to enhance teacher efficiency.

Interestingly, the relatively lower mean score for the statement about AI improving teaching quality (3.95) indicates that teachers may not yet fully perceive AI as a transformative tool for pedagogical improvement. This finding contrasts with Dillenbourg et al. (2022), who found that AI-based professional development tools positively impact teacher confidence and effectiveness. A possible explanation for this discrepancy in Sohar could be a lack of training or familiarity with advanced AI teaching tools, highlighting the need for capacity-building initiatives.

The administrative efficiency dimension had an overall mean score of 4.15, indicating strong agreement on AI's benefits in streamlining school operations and decision-making processes. The highest-rated statement, regarding AI's ability to streamline school operations (mean = 4.30), supports findings by Li et al. (2021), who noted similar outcomes in educational institutions adopting AI for scheduling and resource allocation.

However, the relatively lower score for reducing time spent on administrative tasks (mean = 4.00) may reflect existing inefficiencies in integrating AI systems into daily operations. This finding is consistent with Holmes et al. (2022), who reported that while AI systems are effective in theory, their real-world implementation often faces logistical and technical challenges. For Sohar, investing in robust AI infrastructure and user-friendly interfaces could enhance adoption and efficacy.

The analysis of the dependent variable demonstrated a high overall mean for the dimension of student academic performance (4.12). The highest-rated statement, "AI-powered tools improve student academic achievements" (mean = 4.25), aligns with Wang et al. (2021), who found that adaptive learning technologies significantly enhance academic outcomes in core subjects like mathematics and science.

The relatively lower score for statements about fostering student interest (mean = 4.00) suggests that while AI tools are effective in improving academic performance, they may not yet fully engage students. This finding contrasts with Perez et al. (2020), who highlighted the gamification and interactivity of AI tools as key drivers of student engagement. This discrepancy may reflect the types of AI tools currently used in Sohar's schools, indicating an opportunity to adopt more engaging and interactive platforms.

The equity dimension received an overall mean score of 4.14, with the highest-rated statement being AI's ability to ensure equal access to resources (mean = 4.30). This supports findings from the World Bank (2023), which emphasized the role of AI in bridging educational gaps, particularly in underserved regions.

However, the relatively lower score for narrowing performance gaps (mean = 4.00) highlights persistent challenges in using AI to address deeper systemic inequities. Warschauer and Matuchniak (2020) similarly noted that while AI has the potential to promote equity, its impact is limited by infrastructural and socioeconomic barriers. In Sohar, targeted initiatives to deploy AI tools in marginalized communities could enhance their impact on educational equity.

Teaching quality was the highest-rated dimension of the dependent variable, with an overall mean of 4.18. Participants particularly valued AI's role in enhancing lesson delivery (mean = 4.35) and classroom management

(mean = 4.25). These findings align with Roschelle et al. (2023), who noted that AI-driven analytics and tools improve instructional strategies and organizational efficiency.

The lower-rated statement about addressing diverse student needs (mean = 4.05) indicates an area for improvement. While AI offers significant potential for inclusivity, as noted by D'Mello and Graesser (2021), its full impact may not yet be realized in Sohar's schools. Enhanced training for teachers on leveraging AI for differentiated instruction could address this gap.

Conclusion

In conclusion, this study highlights the significant potential of artificial intelligence (AI) in enhancing educational outcomes in the Wilayat of Sohar's schools. The findings underscore AI's impact on personalized learning, teacher support, administrative efficiency, and its ability to improve student performance, promote equity, and enhance teaching quality. While participants expressed high levels of agreement on the benefits of AI, certain areas, such as addressing systemic inequities and fostering student engagement, require further attention. These insights provide a foundation for future initiatives aimed at integrating AI into educational systems effectively and equitably.

Summary of Findings

i. AI significantly improves personalized learning, with the highest impact on providing tailored feedback to students and enhancing comprehension.
ii. AI tools are effective in reducing administrative burdens and aiding lesson planning, but their role in directly improving teaching quality is less pronounced.
iii. AI enhances school operations and decision-making, though challenges remain in reducing the time spent on certain administrative tasks.
iv. AI-driven tools improve academic outcomes, but their ability to engage students needs further development.
v. AI promotes resource accessibility and inclusivity but has a limited impact on narrowing performance gaps.
vi. AI improves lesson delivery and classroom organization, though its effectiveness in addressing diverse student needs requires further exploration.

Recommendations

i. Provide targeted training programs to equip teachers with the skills needed to integrate AI effectively into their teaching practices.
ii. Expand digital infrastructure in schools, particularly in underserved areas, to ensure equitable access to AI tools and resources.
iii. Utilize more engaging and gamified AI applications to foster greater student interest and motivation.
iv. Implement AI-driven programs specifically designed to bridge performance gaps among students from different socioeconomic backgrounds.
v. Establish continuous monitoring and evaluation mechanisms to assess the effectiveness of AI tools and make necessary adjustments.
vi. Foster partnerships between educational institutions, technology providers, and policymakers to support the sustainable implementation of AI in education.
vii. Support ongoing research to explore emerging AI applications and their potential to address unmet needs in education.

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