

The practices and challenges of implementing artificial intelligence tools in higher education institutions in the Sultanate of Oman

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Abstract

This research investigated the practices and challenges of utilizing artificial intelligence applications in instruction by the instructors at the Faculty of Education and Arts in Sohar University, Sultanate of Oman. To this end, a quantitative analytical descriptive approach was employed, and the research sample consisted of 100 faculty members. After validating and pilot-testing the questionnaire, it was shared with the participants via an online web link. The findings showed a moderate use of AI applications by the faculty members. The primary application of AI-powered tools was for the purpose of lecture preparation and planning. The participants reported using AI-assisted applications as a support tool that requires human scrutiny. Additionally, the findings revealed significant challenges facing the instructors, ranging from, firstly, a lack of professional training; secondly, uncertainty about the institutional policies of use and academic integrity; and, thirdly, challenges related to poor technical integration into the system. The study underscores the need to design specialized training programs to support university instructors and to promote the advanced use of AI-powered tools and applications and develop institutional policies for ethical and legitimate use. Furthermore, higher educational institutions should consider developing technical infrastructure to effectively integrate these tools into the educational process.

Keywords: Artificial intelligence, Challenges, Higher education, Instruction, Practice, Ethical use

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Contribution of this paper to the literature

The present study highlights the current status quo of the integration of AI-powered tools into higher education institutions and compares it to similar contexts. It signifies the challenges that instructors face when they incorporate AI tools in their instruction, calling for support from the institutions to ensure more effective integration.

1. Introduction

Digitalization is increasingly transforming educational institutions, reflecting the impact of the technological revolution. Universities that play a pivotal role in preparing teachers, educational specialists, and those in charge of learning and teaching processes represent examples of institutions that are being influenced by such digital shifts. There has been a growing interest in the potential of artificial intelligence (AI) applications in higher education for the past few years. AI refers to a set of new methods and modern approaches in computer programming that can be used to develop systems that mimic some elements of human intelligence, enabling the systems to perform inference operations (Al-Yazji, 2019). It is considered an advanced field of technology that gives computer systems the ability to perform various tasks similar to human intelligence. Added to that, advanced technologies based on AI improve the learning experience and develop human capabilities in multiple ways, which leads to significant progress in the field of education. Bakr and Taha (2019) illustrate that AI can accurately analyze students' data and track their progress and learning style. AI technologies can address learners' individual needs, level, and skills, which will more likely lead to improving students' academic performance and attainment.

Higher education is a cornerstone of the development and progress in any society, as its various institutions contribute to the knowledge capacity of society through the teaching process, community service, knowledge dissemination, and scientific outcomes (Al-Atoum, 2023). Accordingly, higher education institutions seek to provide up-to-date applications to keep pace with technological development, such as AI applications. Besides being competent in content knowledge and fulfilling their instructional roles, instructors in tertiary education should exhibit a plethora of skills, including the capabilities to produce digital knowledge, communicate and share knowledge electronically with others, manage e-learning systems, and carry out empirical research effectively and efficiently (Al-Otaibi, 2017). Amer (2015) stresses that the teacher is the basis for leading any digital transformation by integrating and using different technologies in the educational process. Abd El-Samad and Ahmad (2020) point out that there are several AI applications and technologies that teachers can employ in the teaching-learning process, such as expert systems, language processing, and the automation of robotic processes.

Hence, the use of AI applications by instructors in higher educational institutions represents a fundamental component to elevate the quality of academic programs and improve their outcomes. This is evident in supporting course designs, managing curricular and extracurricular activities, and improving evaluation and follow-up methods that enable students to learn more independently and innovatively (Abdulkader, 2024; Al-Asmar, 2025; Al-Buraiki & Al-Ruheili, 2025; Al-Buraiki, 2026; Al Ruheili & Al-Buraiki, 2025). AI offers significant contributions to all aspects of education at tertiary levels, resonating with the emphasis of UNESCO on the key role of AI-supported applications in education to promote sustainable development and effectively enhance cooperative integration between human beings and machines in teaching and learning, and in various businesses, professions, and personal lives (Shaaban, 2021). However, there remains a lack of context-specific empirical evidence that uncovers the actual practices and challenges of AI-powered applications in Omani higher educational institutions. Thus, the present study is an attempt to fill this gap and to add to the existing knowledge of technology and AI integration in education.

2. Literature Review

2.1. The Concept of Artificial Intelligence

Artificial intelligence (AI) is a science that studies and develops theories, methods, techniques, and application systems to mimic the human mind. The primary task of AI is to build a system that can resemble the functions of the human brain and control it by a human-computer system (Lufeng, 2018). The term "artificial intelligence" was first used in the 1950s by the American scientist John McCarthy, who indicated that computers would be able to imitate human functions in learning and solving problems (Beyaz, 2020). AI has been defined differently by researchers. For instance, Huang (2018) defined AI as a "computer system designed to interact with human knowledge and behavior, solve problems, retain knowledge, and understand human natural language through learning and reasoning" (p. 3278), while Sadaqa (2023) defined it as one of the advanced computer technologies that represents part of the fourth industrial revolution and relies on designing and innovating computerized systems and machines that are capable of performing many tasks and operations like humans.

Latroush (2025) pointed out that AI is a set of technological solutions that mimic human cognitive functions such as self-learning, searching for solutions without a pre-defined algorithm, and achieving results that are consistent with the results of human intellectual activity when performing specific tasks. The set of technological solutions includes information and communication infrastructure, software that uses machine learning methods, processes and services, data processing, and solution searching. In the academic context specifically, Assi and Al-Anan (2025) defined AI as a set of digital tools and technologies that allow learners to reorganize cognitive material, build personal learning paths, and analyze educational data in a way that goes beyond the conventional individual capabilities. This includes various applications such as adaptive education systems, smart assistants, big data analysis, and generative models such as ChatGPT and others (Al-Buraiki & Al-Ruheili, 2025; Al Ruheili & Al-Buraiki, 2025).

AI aims to fathom the nature of human intelligence through the ways in which computing programs operate that are capable of mimicking intelligent human behavior. In other words, the computer program or application which is powered by AI is capable of solving problems or making decisions by itself as it relies on various inferential processes (Khawaled, 2019). Fahd (2020) pointed out that the goal of AI is replicating human intelligence, solving knowledge-intensive tasks, and improving and developing human-computer interaction. Abdul

Wahab (2020) added that the primary goal of AI is based on automatically or semi-automatically processing information, regardless of its nature or size.

Many diverse forms of AI tools have emerged, and they are pertinent to intelligent teaching systems that support designing content, creating texts and media by using AI generative tools, and fostering adaptive learning environments (Al-Buraiki, 2026). Subsequently, the educational learning process can be developed, and modern applications and technologies in the field of teaching and learning can be utilized (Fahimirad & Kotamjani, 2018). Advancements in AI technologies provide flexible and interactive learning opportunities, identify the strengths and weaknesses of educational systems using machine learning tools, analyze education and learning systems with complete independence, and work to solve problems (Rienties, Köhler Simonsen, & Herodotou, 2020).

2.2. Artificial Intelligence in Education

Education is witnessing significant acceleration in the use of AI-supported applications. Thus, in education in general and tertiary education in particular, instructors and students are widely using diverse AI applications. For instance, AI-powered tools are used to analyze student data and provide educational content that addresses their individual needs, which subsequently increases the effectiveness of teaching and learning. Additionally, the implementation of AI enhances students' participation and classroom interaction (Al-Hoshi & Al-Hoshi, 2024). Artificial intelligence also improves the quality of assessment and evaluation through accurate automated assessment tools that help track student progress and provide immediate feedback. This contributes to developing teaching strategies and achieving educational goals more efficiently (Al-Asmar, 2025). In addition, smart technologies can support faculty members in research and administrative tasks, such as analyzing big data and generating educational content, freeing up their time to focus on human interaction and deep academic guidance (Al-Buraiki & Al-Ruheili, 2025; Almalki, 2023; Al Ruheili & Al-Buraiki, 2025). From a broader perspective, AI enhances the competitiveness of world-class educational institutions and establishes a sustainable and advanced learning environment in line with the requirements of 21st-century skills (Awda, 2025).

Shaaban (2021) listed five areas for using AI in education: managing education, empowering teaching and teachers, evaluating teaching and learning, developing the values and skills necessary for life and work in the era of AI, and providing lifelong learning opportunities for all. Recent research such as Assi and Al-Anan (2025) has also indicated that the use of AI in education cannot be understood in isolation from four interconnected dimensions: firstly, frequency of use, i.e. the extent of regular reliance on AI tools in academic activities; secondly, diversity of use, which means the use of more than one type of technology, i.e. adaptive learning, virtual assistant, predictive analysis, etc.; thirdly, depth of integration, which is the degree to which technology is integrated into the core of the educational process and not its occasional or marginal use; and fourthly, purpose of application, which is the connection between the use of the tool and a specific cognitive goal, not merely experimentation or technical consumption. Collectively, these dimensions confirm that positive educational impact is not achieved through superficial use of the tool, but rather through its integration within a cognitive framework that contributes to stimulating analysis and critical thinking.

AI applications provide various advantages in the field of education, such as enhancing self-learning, increasing the effectiveness of educational processes, conducting automatic assessments, working to speed up tasks, and providing rich educational environments that meet the individual differences of students. AI-assisted tools save time and effort and allow learners to achieve optimal understanding and comprehension of teaching materials on different topics (Eyüp & Kayhan, 2023). AI has become a structural component in contemporary educational systems that has forced a reconsideration of the roles of teachers and lecturers, the selection of teaching methods, the design of educational activities, the improvement of evaluation methods and tools, and patterns of managing the educational process. Bin Zina and Muqatili (2025) confirm that the use of AI tools across various platforms has effectively contributed to raising academic performance compared to traditional distance education.

Artificial intelligence (AI) emerges as one of the main drivers of sustainable development, which enhances institutional efficiency and empowers people to develop competencies of 21st-century future skills. Adapting AI in education aligns with Oman Vision 2040, which seeks to achieve high-quality, technology-integrated, multi-track education. Striving to integrate technological advancement into higher education institutions fosters innovation and entrepreneurship, and enhances skills development (Oman Vision, 2040). The quality of tertiary education is linked to the extent to which it keeps pace with technological developments to boost learning and support scientific research. It is thus recommended to integrate AI with academic programs (Al-Jabri, 2024).

In higher education institutions, instructors face several challenges in using AI in education. Kittany (2025) and Eid and Eid (2024) indicate that there are diverse challenges facing the utilization of AI applications, such as insufficient technical expertise, high costs for AI applications, and lack of the necessary infrastructure. In other words, instructors in higher education institutions struggle to apply AI because of lack of experience and knowledge among faculty members in the field of AI applications in teaching, the weakness of the university infrastructure, a lack of motivation from management to use AI applications, and the high financial costs necessary to apply AI (Al-Atoum, 2023; Al-Khaibari, 2020; Fahimirad & Kotamjani, 2018).

Salem and Afifi (2022) study recommended the need to work on creating enhanced conditions for the use of artificial intelligence (AI) to support university education. Similarly, the findings of the study conducted by Eid and Eid (2024) concluded that the challenges facing the application of AI in higher education are represented in ineffective data governance and management, insufficient technical expertise, high costs for AI applications, privacy, security, ethical considerations, and the lack of necessary infrastructure. Abdulkader (2024) emphasized the role of tertiary educational institutions in overcoming the challenges related to providing supportive infrastructure, providing a qualified cadre to establish effective communication networks before applying AI in teaching, addressing ongoing problems, and conducting training programs that address the real needs of lecturers and instructors.

2.3. Previous Studies

Previous studies have shown the positive impact of employing AI applications in education. Among these studies is the Al-Qatiti and Al-Fana (2025) study, which measured the level of awareness of artificial intelligence

(AI) concepts, platforms, and applications among students and academics in higher education institutions in the Sultanate of Oman. The results of the study showed a difference in understanding the term "artificial intelligence," while there is a simple understanding of the term "Agent." Notably, Al-Qatiti and Al-Fana (2025) only explored the teachers' literacy knowledge of AI and did not investigate their actual practices.

Jawas and Jawas (2024) investigated the extent of the use of AI applications in higher education institutions in Yemen. The study followed a qualitative approach, employing interviews with faculty members in universities. The findings revealed that the use of AI applications in higher education institutions is very limited in Yemen. It also reported that most of the problems associated with the use of AI applications are related to the preparedness of the educational environment and infrastructure.

Al-Saadi (2024) conducted a study that identified the actual practices of tertiary instructors in employing artificial intelligence applications in higher education institutions in the Sultanate of Oman. The study followed a qualitative approach using semi-structured interviews to collect data. The participants of the study were instructors from Sultan Qaboos University (SQU). The findings of the study highlighted some significant areas related to the application of AI, namely the diversity in employing artificial intelligence applications in SQU, and that the most prominent applications used are ChatGPT and the Gemini application.

Al-Atoum (2023) study on Jordanian tertiary instructors explored the requirements for applying artificial intelligence in the field of higher education. The study employed the descriptive approach by collecting data via a survey and content analysis, and the results showed that there is a set of requirements for employing AI applications in higher education, most notably spreading the culture that supports the use of AI in higher education institutions and providing the necessary infrastructure. Among the most prominent challenges of employing artificial intelligence is the lack of availability of specialists and experts in AI technology, and the high cost of implementing AI applications in higher education.

Al-Masry (2022) conducted a study at the University of Jordan to examine how AI technologies contributed to improving the quality of services offered to the students. A questionnaire was distributed to the students to collect the research data. The responses of the students illustrated a moderate use of AI technologies and the quality of services provided to students at the University of Jordan. The results confirmed that there were no statistically significant differences in the quality of services provided to students with respect to the variables of gender and study program, while there were statistically significant differences in relation to academic degree in favor of higher diploma and master's degrees. The study reported that there is a statistically significant role of AI-supported tools in improving the quality of student services at the University of Jordan.

Al-Khudari and Al-Eryani (2021) evaluated the digital infrastructure in higher education institutions in Yemen and its impact on the use of AI technologies in education. The data were collected via a questionnaire that was distributed to 200 information technology specialists in various universities in Yemen. The findings of the study revealed that the digital infrastructure in Yemeni universities is insufficient to effectively integrate AI technologies, and universities also suffer from a lack of funding and specialized personnel to develop the digital infrastructure.

Overall, previous studies show that employing AI applications in higher education holds great potential to improve the quality of education and the services provided. However, challenges related to awareness, infrastructure, and human resources need to be seriously addressed to ensure that the desired benefits of these technologies are achieved. Investing in developing these aspects will have a positive impact on the effectiveness of higher education in the Sultanate of Oman. What distinguishes this study is that it focuses on the actual practices and usages of AI applications in education and the challenges encountered by the faculty members at the Faculty of Education and Arts in Sohar University.

As an academic environment, Sohar University pays attention to AI applications, following the example of advanced educational institutions, and seeks to integrate these technologies into teaching practices to enhance the quality and efficiency of education. It also works to raise awareness among faculty members about the importance of AI and its role in developing teaching and learning methods. It is keen to adopt supporting smart tools and systems to keep pace with modern technological advancements and create an interactive and stimulating educational environment. University faculty members may encounter several challenges in employing AI-supported tools in their teaching that may limit the benefit from these applications or hinder their use. Accordingly, this research aims to investigate the practices of instructors at the Faculty of Education and Arts in Sohar University in relation to AI-supported applications in education, and the challenges they face.

The above discussion illustrates the significance of employing AI applications to enrich the learning environments and support the teaching processes and academic planning (Eyüp & Kayhan, 2023). The potential of AI-assisted technologies allows for students' performance to be analyzed statistically and linked to useful educational strategies. However, most of the above studies were conducted in other contexts rather than the Omani one, i.e., Jawas and Jawas (2024); Al-Atoum (2023); Al-Masry (2022) and Al-Khudari and Al-Eryani (2021), or collected their data using a qualitative approach, i.e. Jawas and Jawas (2024) and Al-Saadi (2024). Hence, the findings of the previous studies may not apply to the Omani higher education institutions, and the problem under study calls for urgent investigation. Anecdotally, the researchers of the present study, in light of their teaching experience in tertiary education, sensed the need to explore the instructors' actual use and practices of AI applications. The findings of the present research are believed to provide practical recommendations that will help teachers adapt effective teaching methods and propose practical approaches that can contribute to overcoming the possible challenges.

Based on the above discussion, the present research aims to answer the following questions.

1. To what extent do faculty members at the Faculty of Education and Arts in Sohar University use artificial intelligence applications in education?
2. What are the challenges facing faculty members at the Faculty of Education and Arts at Sohar University when using artificial intelligence applications?

3. Research Methodology

3.1. Study Design

The present study adopted the analytical descriptive research methodology to investigate the practices and challenges of using AI applications by higher education instructors in the Sultanate of Oman. The descriptive-analytical approach suits the purpose of the present study as this type of study tends to describe the phenomenon, revealing the actual reality of the use of AI applications in education by the faculty members at the Faculty of Education and Arts in Sohar University and the challenges they face. It is worth noting that this study design is not limited to collecting, classifying, and analyzing data and facts, but rather includes interpreting the results and arriving at generalizations regarding the phenomenon under study (Al-Harbi, 2019).

3.2. Study Participants

The participants of the study included the faculty members of the Faculty of Education and Arts (FEA) at Sohar University in the Sultanate of Oman in the academic year 2025–2026. The study sample consisted of 100 instructors from various study programs in the FEA.

3.3. Study Instrument

After reviewing the pertinent literature and related empirical studies that emphasized the applications of AI and its potential in education, a questionnaire was developed. The questionnaire in its initial form comprised 24 items, distributed over two dimensions: the practices of using AI applications in education and the challenges and obstacles when using AI applications in education.

3.3.1. Instrument Validity

The face validity of the research instrument was obtained by presenting it to a panel of judges from Sohar University professors, and further modifications were applied to rephrase some items, merge others, and delete duplicates. The questionnaire in its final form consisted of 18 items, distributed over the two dimensions, as shown in Table 1.

Table 1. The questionnaire items.

Dimension	Before face validity	After face validity
The instructors’ implementations of AI application in teaching	12	10
The challenges instructors face when using AI applications in teaching	12	8

To ensure the internal consistency of the research instrument, a pilot test was conducted with a random sample of 20 faculty members from the Faculty of Education and Arts at Sohar University. The Pearson correlation coefficient was calculated between the score of each item and the total score of the dimension to which the item belongs. This procedure was used to examine the degree of association between each item and its corresponding construct, thereby determining the internal consistency of the instrument. The results of the item–dimension correlations are presented in Table 2.

Table 2. Pearson Correlation Coefficients Between each Item and the Total Score of the Dimension to Which it Belongs.

The instructors’ implementations of AI applications in teaching		The challenges instructors face when using AI applications in teaching	
#	The correlation	#	The correlation
1	0.80**	1	0.75**
2	0.86**	2	0.64**
3	0.72**	3	0.57**
4	0.86**	4	0.81**
5	0.76**	5	0.78**
6	0.78**	6	0.68**
7	0.80**	7	0.77**
8	0.74**	8	0.71**
9	0.78**		
10	0.72**		

Note: ** Correlation is statistically significant at the 0.01 level.

The results in Table 2 show that all the item-total correlations were statistically significant, with coefficients ranging from 0.57 to 0.86. This indicates a high degree of internal consistency among the items.

The Pearson correlation coefficient was also calculated between the score of each dimension and the total score of the questionnaire, and the results are displayed in Table 3.

Table 3. Pearson’s correlation coefficient between the dimensions and the overall score.

The dimension	The correlation
The instructors’ implementations of AI applications in teaching	0.85**
The challenges instructors face when using AI applications in teaching	0.53**

Note: ** Correlation is statistically significant at the 0.01 level.

The relationship between each dimension and the total questionnaire score was calculated using Pearson’s correlation coefficient. As shown in Table 3, the two dimensions demonstrated strong positive correlations with scores of 0.53 and 0.85. Hence, all the correlations were statistically significant at the p<0.01 level, illustrating the internal consistency and structural validity of the instrument.

3.3.2. Instrument Reliability

To ensure the reliability of the instrument, the questionnaire was completed by a small number of participants who were not included in the actual data collection. Cronbach's alpha was calculated, and the results are displayed in Table 4.

Table 4. Reliability Statistics (Cronbach's Alpha).

The dimension	Reliability score
The instructors' implementations of AI applications in teaching	0.93
The challenges instructors face when using AI applications in teaching	0.86
Overall	0.90

Table 4 shows that the data collection instrument has high reliability in all dimensions, which confirms its suitability for application.

4. Findings and Discussion

Means and standard deviations of the responses of the participants were calculated to report the findings of the questionnaire items. Table 5 shows interpretations of the results according to the 5-point Likert scale.

Table 5. Mean Interpretations.

Mean	Interpretation
1-1.80	Very low
1.81-2.60	Low
2.61-3.40	Moderate
3.41-4.20	High
4.21-5	Very high

To answer the first research question, “To what extent do faculty members at the Faculty of Education and Arts in Sohar University use artificial intelligence applications in education?”, the means and standard deviations of the participants’ responses to the questionnaire items were measured. Table 6 displays the means and standard deviations of the participants’ responses.

Table 6. Means and Standard Deviations for Faculty Members’ Use of Artificial Intelligence Applications in Education.

#	Item	M	SD	Level
1	I conduct a human review for all AI outputs before I approve them.	3.86	1.33	High
2	I use AI tools to design instructional activities and supportive materials, i.e., slides, questions, examples.	3.82	1.02	High
3	I use AI tools to generate ideas and outlines for my lectures.	3.71	1.02	High
4	I direct my students to use AI tools ethically and appropriately.	3.5	1.20	High
5	I use AI tools to support students with special needs and individual differences, i.e., simplifying, summarizing, incorporating multimedia.	3.21	1.11	Moderate
6	I use AI tools in academic research work, i.e., literature review, generating outlines, generating codes and analysis.	3.21	1.18	Moderate
7	I use AI tools to provide constructive feedback for students, i.e., formation, customization.	3.17	1.16	Moderate
8	I use AI tools to analyze students’ study data and progress.	3.1	1.20	Moderate
9	I use AI tools to write formative and summative exam questions.	3.06	1.28	Moderate
10	I employ AI add-ons in the university LMS or university platforms.	3.05	1.12	Moderate
Overall		3.37	0.91	Moderate

Table 6 shows that the faculty members at the Faculty of Education and Arts in Sohar University moderately use AI applications in their teaching processes. The overall mean is (3.37), and its standard deviation is (0.91). This indicates that AI is actually present in the practices of most of the faculty members. However, its employment is still in the stage of partial or selective use rather than being an integrated and regular part of the educational process in its various dimensions. This result is consistent with the study of Al-Qatiti and Al-Fana (2025), the study of Jawas and Jawas (2024), the study of Al-Saadi (2024), and the study of Al-Masry (2022), which showed that the reality of the use of AI applications is moderate, variable, and limited by academics.

The findings show that the highest mean is the item related to conducting a final human review of all AI outputs before they are approved, with a mean of (3.86), which is considered at a high level, and this indicates that faculty members who employ AI tools tend to treat them as complementary tools and not a substitute for human judgment. Hence, the instructors apply human scrutiny to judge the outputs and to adjust it to the needs of their learners. This reflects an awareness of the limitations of AI, the possibility of error or bias in its outputs, and a tendency to ensure the accuracy and quality of what is presented to students.

The results also highlight that the use of AI in designing learning activities and support materials such as slides, questions, and examples ranks high, with an average of 3.82. This indicates that a significant number of the faculty members utilize AI tools to prepare course materials such as developing presentation slides and generating practice exercises. This could be because AI tools offer quick and efficient production processes of instructional content and illustrative examples. This can be explained by the fact that this type of use is one of the most direct and easy forms of integration into daily teaching practices and does not necessarily require fundamental modifications in the teaching strategies (Al-Buraiki, 2026).

Additionally, the findings illustrate that the use of AI-assisted tools to generate ideas or plans for lectures achieved a mean of (3.71), which reflects a high level of agreement among the research participants. It is understood from this that the faculty members utilize AI tools in the planning stage of the course or lecture by suggesting titles, organizing the sequence of topics/ideas, or providing initial visualizations of the lectures. This

suggests the use of AI tools as a mental and creative support tool that helps generate and organize ideas, especially in light of time constraints and large teaching burdens (Abdulkader, 2024; Al-Buraiki, 2026; Al Ruheili & Al-Buraiki, 2025).

The item “I direct my students to use AI tools ethically and appropriately” is also rated high by the faculty members with a mean of 3.5, but lower than the above-discussed items. This indicates that the employment of AI is still mostly faculty-centered rather than student-centered. The teacher uses it primarily in preparation and design, while students’ guidance for the systematic and ethical use of these tools to fulfill course assignments is still in the process of being gradually expanded. It is understood that there is some reservation or need for greater clarity in educational policies prior to giving students more space to use these applications. It can also be interpreted that the present study targeted the instructors rather than the students. Hence, exploring the actual practices and uses of AI tools among students constitutes a potential future research area.

The items that received moderate ratings indicate less widespread or more complex areas of use in the employment of AI in education. The first item, which the participants moderately agreed upon, is “I use AI tools to support students with special needs and individual differences,” with a mean score of 3.21. Another item that scored a similar mean is “I use AI tools in academic research work.” This indicates that the investment of AI in achieving the principle of differentiated and inclusive education is still at a moderate level, despite the great potential that these tools offer in adapting content to the different needs of learners. The same mean is reported about employing AI tools for research purposes, which points out that the faculty members have begun to use AI applications in reviewing literature, drafting initial drafts, or supporting analyses, but this use has not yet become a widely common practice.

The results also show that using AI to improve feedback to students in terms of formulation or personalization comes with a mean of (3.17), and using it to analyze student learning data and monitor progress with a mean of (3.10) are both considered moderate. It is recognized that the investment of AI capabilities in the diagnostic and tracking aspects of learning, i.e., in analyzing student performance patterns and providing more comprehensive and personalized feedback, remains relatively limited, which may be attributed to the need for deeper integration of these tools with learning management systems and to the lack of specialized training in learning data analysis among faculty members.

The means of reliance on AI in generating formative or summative assessment questions and the employment of AI add-ons or components in learning management systems or university platforms are (3.06) and (3.05), respectively. This uncovers a moderate use of AI in designing formal assessment tools, as well as in utilizing integrated components within e-learning environments. This may be related to concerns about the reliability of the questions generated, technical difficulties in activating add-ons and integrating them with existing systems, or the absence of institutional policies that clearly encourage this type of use (Al-Buraiki & Al-Ruheili, 2025).

Overall, the above-reported findings show that the faculty members’ use of AI applications is primarily selective and preparatory in nature. The use is more concentrated on the stage of preparing content and activities, and generating ideas, with a clear tendency to apply human review to judge the appropriateness and accuracy of the outputs. In contrast, AI is still employed in more advanced fields, such as analyzing learning data, customizing feedback, supporting differentiated education, and evaluation. The integration of tools with learning-management systems illustrates an existing gap between the actual capabilities of AI-supported tools and applications and real practices in the educational field.

The overall mean of the dimension is (3.37), which reflects a moderate level of usage that does not yet rise to widespread and systematic use, and at the same time goes beyond the stage of limited or symbolic use. This can be explained by the fact that faculty members in the college are going through a transitional phase in adopting AI applications, which combines a noticeable desire to benefit from these tools, especially in aspects of preparation and design of materials. There are still challenges and obstacles, i.e., professional, organizational, technical, and ethical, that limit the expansion of this use to include all components of the educational process in an integrated manner: teaching, learning, assessment, support for individual differences, and analysis of learning data.

To answer the second question, “What are the challenges facing faculty members at the Faculty of Education and Arts in Sohar University when using artificial intelligence applications?”, the means and standard deviations of the participants’ responses were calculated, and the results are shown in Table 7.

Table 7. Means and standard deviations for the challenges encountered while using AI tools in education.

#	Item	M	SD	Level
1	Lack of professional training for using AI	4.16	0.69	High
2	Legal and ethical concerns, i.e., intellectual property, privacy, algorithmic bias	4.02	0.89	High
3	Poor infrastructure and high subscription charges to AI tools	3.99	0.77	High
4	Absence or unclear institutional policies on AI tools	3.98	0.85	High
5	Lack of time to experiment and adopt AI-supported activities	3.96	0.93	High
6	It is hard to mark students’ work in light of their usage of AI.	3.92	1.00	High
7	Resistance to change limits proper adaptation.	3.88	0.98	High
8	Weak complementation of AI tools with the university LMS, email, and database	3.87	0.92	High
	Overall	3.97	0.62	High

Table 7 shows that the study participants in the Faculty of Education and Arts at Sohar University are aware of the existence of major obstacles that prevent the effective use of these applications. The overall mean for the dimension reached (3.97), indicating a high level of agreement. The standard deviation is (0.62), which reflects that these challenges are not marginal or circumstantial, but rather are an influential part of the existing educational and organizational environment. The leading of these obstacles is the lack of specialized professional training on AI-supported tools. This item is rated high with a mean of (4.16), indicating an explicit consensus among the university instructors that their skills in dealing with AI tools still need professional development that goes beyond general theoretical knowledge to hands-on training related to their daily teaching practices. Such training enhances the instructors’ skills to design activities, prepare course content, and develop customized assessments with the

help of these AI tools. It can be inferred from the participants' responses that the availability of specialized training programs can directly contribute to mitigating the impact of the obstacles and increase their ability to adopt AI in the educational process. This finding aligns with the studies of Al-Khudari and Al-Eryani (2021); Al-Atoum (2023); Al-Saadi (2024); and Al-Buraiki (2026).

The item "Legal and ethical concerns, i.e., intellectual property, privacy, algorithmic bias" is viewed as a major challenge, as it scored a mean of 4.02. This reveals that part of the instructors' reluctance to use AI applications is due to uncertainty about the legality of using the outputs of these tools, the limits of dealing with students' data, and the possibility that some models contain cultural or linguistic biases. It is understood that adopting clear policies and explicit ethical guidelines at the institutional level can alleviate these concerns and allow for a more reassuring and responsible use of these applications.

The results also show that "Poor infrastructure and high subscription charges to AI tools", which scored a mean of (3.99), represent a major obstacle to the effective adoption of AI applications. This finding signifies that some university instructors face challenges related to the reliability of internet connectivity and the availability of appropriate hardware and software. Thus, the obstacles are not limited to the level of individual competencies, but they extend to the availability of resources and infrastructure that enable the actual and sustainable use of these technologies in classrooms and the university environment in general. This result is supported by previous studies' findings such as Al-Khudari and Al-Eryani (2021); Al-Atoum (2023); Jawas and Jawas (2024) and Al-Buraiki and Al-Ruheili (2025).

Another notable obstacle is the lack of clarity of institutional policies regulating the use of AI applications, as the mean of this item is (3.98), signifying a high level of agreement among the university instructors. This indicates that faculty members may not have accurate knowledge of what is or is not permissible regarding their or their students' use of these AI applications in teaching, learning, and evaluation. Subsequently, many of them tend to practice caution when using AI tools in order to prevent committing unintentional violations. This finding underscores the importance of universities formulating written and announced policies that include clear controls and specific usage mechanisms, creating a legislative and regulatory framework that supports the responsible use of AI in education.

The results also indicate that the lack of time available to experiment and adapt educational activities based on artificial intelligence represents a major obstacle for faculty members, with a mean score of (3.96). This finding reflects the high workload of the university instructors that impedes them from allocating sufficient time to experiment with new AI tools and incorporate AI tools in redesigning the academic courses and activities. Therefore, the lack of sufficient time for experimentation is a factor that curbs the spirit of educational innovation, and at the same time indicates the need to provide institutional support, whether by reducing some burdens or granting incentives related to projects to develop enhanced teaching by AI.

In the same context, the results showed that the difficulty of evaluating students' work in light of their use of AI applications is one of the important challenges, as the mean score of this item is (3.92), representing a high level of agreement. This reflects the concern of the participants about the extent of their ability to distinguish between the students' self-production and what may be the result of using AI tools. This challenge is linked to the questions about the fairness of the evaluation and its reliability in measuring students' actual learning. Several previous studies echo similar concerns, illustrating the need to reconsider the evaluation strategies used and to develop alternative or complementary evaluation methods, such as oral evaluation, project-based evaluation, and interim evaluation that focuses on the learning process and not just the final product (Al-Buraiki & Al-Ruheili, 2025; Al-Ruheili & Al-Buraiki, 2025).

In summary, the above-reported findings underscore the main challenges encountered by university faculty members when using AI applications in education. Most importantly, the key challenges include a lack of professional training, inadequate time for experimentation, the legal and ethical concerns related to ownership, privacy, and bias, poor infrastructure represented in technical capabilities, costly subscriptions, institutional policy, and system integration. Addressing these obstacles requires a comprehensive institutional vision that involves empowering the university instructors, creating a supportive technical and organizational environment, and initiating a positive culture towards employing AI to better serve the teaching and learning processes.

5. Summary, Conclusion and Recommendations

The present study investigated the practices and challenges of using AI applications and tools in higher educational institutions. The data were collected via a questionnaire to 100 faculty members of Sohar University in the Sultanate of Oman. The findings revealed a moderate use of AI applications in education (3.37), with more emphasis on preparing and developing course materials like designing slides, questions, and examples, generating ideas for lectures, rather than their use at all stages of the educational process. Faculty members who use AI tend to treat it as a supportive tool, not a substitute for human expertise. They often conduct a final human review of its outputs before they are approved, reflecting a relative awareness of its limitations and the potential for error or bias. The use of AI in more advanced areas like analysis of student learning data, personalization of feedback, support for individual differences and people with special needs, and integration of artificial intelligence tools with learning management systems does not receive significant attention from the university lecturers. The challenges and constraints associated with the use of AI are generally significant (3.97), and they are represented in lack of training and time constraints, organizational and ethical concerns, absence/ambiguity of policies, and ethical and legal concerns. Additionally, technical support, reliable infrastructure, subscription costs, and poor integration with systems underscore fundamental challenges. There is a clear gap between the potential of AI in boosting teaching and learning, and the actual practices of university lecturers.

In light of the findings and discussion, it is vital to design and implement specialized and professional training programs on AI applications in education, considering the nature of educational and literary disciplines and focusing on advanced uses such as learning data analysis, personalized feedback, and support for individual differences. Higher educational institutions are expected to develop explicit institutional policies that regulate the use of AI by both faculty and students in teaching, learning, evaluation, and scientific research that align with national and international standards. It is also fundamental for universities to improve their technical

infrastructure by boosting internet connectivity, providing institutional licenses for the most important educational and research AI tools, and enhancing their integration with learning management systems and university platforms. Furthermore, it becomes imperative to adopt assessment strategies that are appropriate to the era of AI, i.e., the use of a combination of formative and summative assessment, more focus on the learning process, and the use of oral and practical tasks and project-based assessment that reduce the chances of illicit reliance on AI tools.

With respect to research, more comparative studies should be considered that encompass different colleges and universities to examine the differences in the actual application of AI tools and the challenges associated with them. As the present study is analytically descriptive, conducting qualitative research by using in-depth interviews or focus groups is recommended, since such studies will shed more light on the faculty and student experiences with AI, provide a deeper understanding of the cultural and ethical representations, and thus propose practical models for its integration into tertiary education.

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