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# THE REALITY AND OBSTACLES RELATED TO EMPLOYING ARTIFICIAL INTELLIGENCE APPLICATIONS IN TEACHING IN UNIVERSITIES FROM THE PERSPECTIVE OF ACADEMICS

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## ABSTRACT

*The aim of this study is to identify the reality and obstacles to employing artificial intelligence applications in teaching in universities from the perspective of academics. The quantitative descriptive approach was used. A questionnaire tool of 19 items was prepared and checked for reliability and validity. The study sample consisted of (175) academics from universities during the 2025-2026 academic year. Results of this study indicate that the reality and obstacles to employing artificial intelligence applications in teaching were moderate. Also, there are statistically significant differences attributed to the variables (college and academic rank) in the employment of artificial intelligence applications, while no significant differences were observed for gender. Therefore, it is recommended that additional training be given to academics to expand the scope of AI utilization in teaching and learning processes and strengthen the infrastructure and institutional resources to help academics keep pace with the rapid advances in AI in education.*

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**KEYWORDS:** Artificial Intelligence Applications, Artificial Intelligence (AI) Applications in Higher Education, Universities.

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## 1. INTRODUCTION

The growing presence of artificial intelligence in all fields has led to a paradigm shift in the education sector, particularly in higher education institutions, which are considered centers of knowledge, innovation, and social change. Integrating artificial intelligence in higher education institutions offers a chance to rethink and reinvent what education, research, and management mean in the twenty-first century. AI is more than just a tool; it is a reflection of a society's potential and goals. Universities must thus adjust to this new reality and actively participate in shaping a future where artificial intelligence (AI) drives quality, equity, and academic excellence (Muñoz et al., 2024).

The role of university professors has undergone a radical transformation with the emergence of AI applications in teaching. Prominent among these changes are the shift from knowledge transmitters to learning facilitators, enhanced personalization, a focus on human-centered skills, the integration of AI tools into curricula, and the development of assessment methods, lifelong learning, and skills development. With the integration of AI into higher education, educators are expected to provide ethical oversight, ensure responsible AI use, address bias, and promote digital well-being (Lyu et al., 2025; Sadiku et al., 2022).

In the context of higher education in Oman, Oman Vision 2040 recommended enhancing lecturers' competencies related to artificial intelligence applications and technology in general (Oman Vision 2040, 2021). In light of the foregoing, this study attempts to investigate the reality and obstacles related to employing artificial intelligence applications in teaching in Universities from the Perspective of Academics.

### 1.1. Problem Statement

Many Arab and foreign studies have indicated the importance of employing artificial intelligence applications in teaching (Jaboob et al., 2024; Mondal et al., 2023; Tojiboyeva, 2024). The integration of artificial intelligence (AI) applications in teaching at Omani universities has shown promising positive impacts, as evidenced by various studies. These studies highlight the effectiveness of AI tools in enhancing educational outcomes, improving teaching practices, and fostering student engagement. The study of Al-Saiari et al. (2024) revealed that the teaching competence of Omani university lecturers using generative AI improved significantly. Also, the Sujee et al. study (2024) indicated that by incorporating artificial intelligence

in Omani higher education, institutions can enhance the learning experience for students and improve teaching methods. While a study by Khalil & Alsenaidi (2024) emphasizes the need for higher educational institutions to prioritize AI competency development in instructor training.

At the same time, the implementation of AI in teaching at Omani universities reveals several research gaps and limitations that future studies must address to enhance policy and practice. Current literature indicates a lack of comprehensive use cases and specific applications of AI in higher education, particularly in the context of Omani institutions (Alshamy et al., 2025; Fadlelmula & Qadhi, 2024; Hammad & Al-Ani, 2021). Also, there is a need for aligning the use of artificial intelligence applications in teaching at Omani universities with Oman Vision 2040, which is essential not only for educational innovation but also for national transformation (Albous et al., 2025; Naidu et al., 2024; Sujee et al., 2024).

### 1.2. Study Questions

- 1- What is the reality of employing artificial intelligence applications in teaching in Universities from the Perspective of Academics?
- 2- What are the obstacles to employing artificial intelligence applications in teaching in Universities from the Perspective of Academics?
3. Are there statistically significant differences attributed to the variables (gender, college, academic rank) in the employment of artificial intelligence applications at the Universities?

### 1.3. Study Objectives

- 1- To identify the reality of employing artificial intelligence applications in teaching in Universities from the Perspective of Academics.
- 2- To identify the obstacles to employing artificial intelligence applications in teaching in Universities from the Perspective of Academics
- 3- To determine whether there are statistically significant differences attributed to the variables (gender, college, academic rank) in the employment of artificial intelligence applications at the Universities.

### 1.4. Significance Of the Study

The use of artificial intelligence in higher education goes beyond simply advancing

technology; it reshapes the dynamics of teaching. Its importance lies in the following:

#### 1.4.1. Theoretical Significance

The study addresses a contemporary topic that is actively discussed in academic and technical circles, prompting many universities to review and explore the literature on artificial intelligence applications. Consequently, the significance of this research lies in its provision of a solid scientific knowledge base that interested parties and researchers can refer to. It also represents a valuable contribution to the Omani and Arab body of scholarship in the field of artificial intelligence.

#### 1.4.2. Practical Significance

The study contributes to a comprehensive survey of the University of Nizwa's use of artificial intelligence applications in teaching. This enables senior management to identify strengths and areas that need development and modernization. It can also benefit other Omani and Arab universities by providing a tool that can be used by specialists and researchers.

#### 1.5. Definition Of Terms

**Artificial intelligence applications:** It is defined by Ertel (2024) as: "The utilization of AI to emulate human cognitive functions, including perception, reasoning, and decision-making, thereby enhancing various aspects of daily life through intelligent machines and smart computer systems" (p.32).

While Artificial intelligence (AI) applications in higher education are defined by Sadiku et al. (2024) as: "advanced technologies that enhance teaching and learning processes through personalized, adaptive, and efficient methods. These applications facilitate various educational services, including intelligent tutoring systems, automated grading, and the development of customized learning experiences, thereby transforming traditional educational paradigms" (p. 22).

The procedural definition of the concept of artificial intelligence applications in this research refers to everything that university teachers use in their academic work during the stages of teaching, whether in the introduction, explanation, discussion, or assessment stages, using modern technologies provided by the university and various applications available through the information network.

**Nizwa University:** one of the private universities operating in the Sultanate of Oman and is a non-profit private university. It includes several faculties, including science and arts, engineering, and health

sciences. Most of its students are from within the Sultanate, and it also welcomes a large group of international students.

#### 1.6. Limitation of the Study

**There are limits to this study, which are as follows:**

- Objective limits: The current study was limited to identifying the reality and obstacles to employing artificial intelligence applications in teaching in Universities from the Perspective of Academics
- Human limits: Academics working in Omani Universities from the Perspective of Academics.
- Temporal limits: The academic year 2025-2026.
- Spatial limits: The study was applied to various colleges, institutes, centers, departments, and deanships in Omani universities.

### 2. LITERATURE REVIEW

#### 2.1. Artificial Intelligence Applications in Teaching at Universities

Artificial intelligence offers a rich repertoire of applications in higher-education teaching. In terms of personalized & adaptive learning, AI platforms adjust content, pacing, and difficulty to each student's strengths and weaknesses. Also, Intelligent Tutoring Systems (ITS) Platforms engage with students through natural-language dialogue and dynamic feedback, simulating one-on-one tutoring to deepen comprehension (Möller et al., 2024). In the contexts of automated grading & feedback tools, it automates scoring for quizzes, essays, and code exercises, offering consistent and immediate feedback while cutting faculty grading time significantly. Also, AI analyzes data from attendance, performance, and engagement to identify at-risk students early, enabling timely interventions and tailored support (Ali, 2024).

According to Singh and Pathania (2024), learning dashboards offer educators and sometimes students a data-driven view of progress and areas needing attention. Also, in terms of content creation and course design, educators can leverage generative AI (e.g., ChatGPT) to streamline syllabus creation, generate lecture outlines, draft assessments, and curate up-to-date readings, reducing preparation time and enhancing adaptability. AI-enabled systems like Canvas and Blackboard Ultra learn from student performance to offer personalized recommendations, adaptive assignments, and automatic feedback features. AI-integrated VR and AR environments enable realistic simulations for medical, engineering, or language training—offering practical experience

in a controlled setting (Firat, 2023).

AI tools can also support real-time translation, speech-to-text, and captioning for lectures and materials—helping non-native speakers, remote learners, and students with disabilities engage fully. In terms of administrative automation & student services, universities use AI-powered chatbots for help desks supporting admissions, enrollment, financial aid queries, and general Q&A at scale (Tojiboyeva, 2024). AI in higher education is already reshaping teaching from adaptive learning to administrative automation. Its strategic application offers a transformative foundation for more effective, inclusive, and adaptive learning environments when implemented thoughtfully and ethically.

## **2.2. Opportunities of Employing Artificial Intelligence Applications in Teaching at Omani Universities**

Higher education institutions in Oman stand to gain significantly by integrating artificial intelligence technologies into teaching and learning practices. Rooted in national priorities like Oman Vision 2040, AI aligns with goals of innovation, personalized education, and building a knowledge-based economy. AI platforms tailor content dynamically to student performance, adjusting pace, complexity, and feedback in real time. This enhances engagement across ability levels, improving learning outcomes for high achievers and those needing extra support (Sujee et al., 2024; Naidu et al., 2024).

In this context, Nizwa University encourages the use of artificial intelligence applications. Through strategic emphasis on AI & digital transformation, Nizwa's recent "19<sup>th</sup> Cultural Season" emphasized AI, digital transformation, and labor market readiness through seminars, student innovation exhibitions, and alumni engagement, embedding AI awareness at the institutional level (Times of Oman, 2024). The University of Nizwa also has a partnership with ITG; Nizwa deployed EduWave and WaveERP, which is a fully integrated e-learning and ERP solution. Educators benefit from automated instructional tools, while students experience seamless learning and course administration, improving efficiency and educational quality.

Generally, AI in Omani higher education moves institutions toward smarter, more inclusive, and outcome-focused teaching. It enhances student success, supports instructors, and aligns with Oman's national goals. Adoption should be paired with ethical frameworks, infrastructure investment, and professional development to maximize impact responsibly.

## **2.3. Obstacles Of Employing Artificial Intelligence Applications in Teaching at Omani Universities**

There are the key obstacles faced by Omani universities when adopting AI in teaching, drawing from regional trends and Omani-specific studies, which include faculty resistance and fear of change, many educators are hesitant to modify teaching methods or adopt AI tools, fearing job displacement and a shift in pedagogical roles. Both faculty and students may resist unfamiliar learning models involving AI-assisted problem solving (Al Matari et al., 2023).

Also, Omani instructors often lack adequate AI literacy and effective training, which undermines adoption. Without ongoing professional development, educators struggle to integrate AI pedagogically. There are other obstacles represented by infrastructure and resource constraints. AI applications demand robust IT infrastructure, high-speed internet, secure data storage, and computing hardware, which are unevenly available across campuses (Ali, 2025).

Other obstacles include the following: AI adoption raises significant concerns about data protection, student privacy, fairness, and algorithmic bias. Lack of transparency around AI decision-making ("black box") complicates trust, responsibility, and accountability. Overuse of generative AI (e.g., ChatGPT) may undermine critical thinking and encourage plagiarism; concerns are more pronounced among professors worried about cheating and loss of original student work (Alshamy et al., 2025).

Many studies and research related to the applications of artificial intelligence in teaching at universities have been reviewed, including the study by Vieriu and Petrea (2025), conducted at the National University of Science and Technology in Bucharest, which investigates the impact of AI technologies on students' learning processes and academic performance. The study adopted the descriptive analytical approach and used a questionnaire to collect data. The study sample consists of 85 second-year students who had direct experience with AI-enhanced learning environments. The findings reveal that AI offers significant benefits, including personalized learning, improved academic outcomes, and enhanced student engagement. However, challenges such as over-reliance on AI, diminished critical thinking skills, data privacy risks, and academic dishonesty were also identified. The study recommends the necessity of a structured framework for AI integration,

supported by ethical guidelines, to maximize benefits while mitigating risks.

Jomaa et al. study (2025) also examined teachers' attitudes toward using AI tools to teach English vocabulary in EFL within the context of higher education in Oman. The study adopted a mixed-method research design and used a questionnaire (closed-ended and open-ended questions) to collect data. The study sample consists of 70 English teachers teaching at the preparatory studies center at one of the Omani universities. The findings showed that the English instructors have a positive attitude toward the advantages of the use of AI tools in teaching English in general and vocabulary in particular. The study recommends that teachers should be provided with sufficient training to exploit such tools in providing their students with effective and engaging teaching methods.

Al-Saiari et al. (2024) conduct a study to identify the impact of using artificial intelligence applications on the digital privacy of individuals and institutions in the Sultanate of Oman. The study adopted a qualitative approach, using three focus groups and eight semi-structured interviews as data collection tools. The sample consists of six institutions: four government agencies and two private institutions. The results also indicated that artificial intelligence applications could be used to commit information crimes such as electronic blackmail, theft of government data, and system disruptions. The researchers recommended the need to design a program for employees in institutions to enhance and raise their technical, legislative, and regulatory awareness in dealing with modern and advanced technologies.

Alshamy et al. (2025) explore the perceptions of generative artificial intelligence (GenAI) tools, such as ChatGPT, among students and academics at Sultan Qaboos University (SQU) within the context of higher education in Oman. The study adopted the descriptive analytical approach and used a questionnaire to collect data. The study sample consists of 555 students and 168 academics that provide valuable insights into the opportunities and challenges associated with the adoption of GenAI tools. The findings reveal notable differences between students and academics regarding their perceptions of GenAI tools across all TAM variables. The study recommends the need for regulatory frameworks, comprehensive institutional guidelines, and targeted training programs to ensure the ethical and responsible use of GenAI technologies.

Kottara and Zaridis (2024) provide a comprehensive overview of the role of artificial

intelligence (AI) in teaching in higher education institutions. The authors conducted a systematic review of A total of 220 studies were found in the field of "Artificial Intelligence in Tertiary Education," of which 29 were most relevant to the issues under examination in this study. The findings of this study highlight aspects that demonstrate, despite the benefits arising from AI, it is crucial to re-examine issues related to policy setting in the academic community to avoid negative impacts under ethical considerations.

Al Matari et al. (2024) conduct a study to identify artificial intelligence and the future of teaching in higher education institutions, represented by the University of A'Sharqiyah in the Sultanate of Oman as a model. The authors conducted the qualitative approach through an interview with (4) technologically capable teachers who have experience in employing artificial intelligence in teaching. The results showed that AI (artificial intelligence) can be used to personalize learning, automate grading, provide virtual assistance, and analyze data. The researchers recommended emphasizing the importance of employing artificial intelligence in teaching and considering the ethical aspects of regulating the application of artificial intelligence in teaching.

Finally, Khalil and Alsenaidi (2024) explore the competencies required by digital teachers to effectively leverage AI in fostering a future-ready classroom environment. The study adopted the descriptive analytical approach and used a questionnaire to collect data. The study sample consists of 26 teachers from the University of Technology and Applied Science in Oman. The findings reveal no significant differences in the perceived importance of AI competencies between teachers with less than 10 years of practical experience and those with 10 years or more of experience. The study recommends the need for educational institutions to prioritize AI competency development in teacher training.

### 3. METHODOLOGY

#### 3.1. Research Design

This study adopted a descriptive approach, as it suits the nature and objectives of this study. It is a methodology that emphasizes the characterization and analysis of phenomena without necessarily establishing causal relationships (Walliman, 2021).

#### 3.2. Population Of Study

The study population will consist of all academics at the University of Nizwa in the Sultanate of Oman,

(570) faculty members, according to the statistics of the Human Resources Department at the University of Nizwa for the current year 2023-2024 (University of Nizwa, 2024).

### 3.3. Study Sample

Available sample was used in this study. It was

intended to draw a sample of all academics at the University of Nizwa in the Sultanate of Oman. In this study, sample size of the population was calculated by Krejcie and Morgan tables (1970). The results of this statistical test revealed that a sample size of 175 subjects was appropriate for this study. The distribution of this sample size is given below in table 1.

*Table 1: Sample Size of the Study.*

| Variable      | Category            | Frequency | Percent |
|---------------|---------------------|-----------|---------|
| Academic rank | Professor           | 15        | 8.6     |
|               | Associate Professor | 50        | 28.6    |
|               | Assistant Professor | 85        | 48.6    |
|               | Lecturer            | 25        | 14.3    |
| Gender        | Male                | 126       | 72.0    |
|               | Female              | 49        | 28.0    |
| Colleges      | Science and Arts    | 70        | 40.0    |
|               | Health Sciences     | 30        | 17.1    |
|               | Engineering         | 20        | 11.4    |
|               | Management          | 40        | 22.9    |
|               | Other               | 15        | 8.6     |
| Total         |                     | 175       | 100.0   |

As shown in Table (1), nearly half of the participants were Assistant Professors (48.6%), followed by Associate Professors (28.6%) and Professors (8.6%). Regarding gender, the majority were male (72%), compared to females (28%). In terms of college affiliation, the highest proportion came from the College of Science and Arts (40%), followed by the College of Management (22.9%) and the College of Health Sciences (17.1%). Smaller proportions were represented by the College of Engineering (11.4%) and other colleges (8.6%). This distribution indicates a diverse sample, enhancing the validity and generalizability of the study's findings.

### 3.4. Data Collection Tools

To achieve the study objectives and answer its questions, a questionnaire was developed using previous studies that addressed the reality of employing artificial intelligence applications in teaching, such as the study of Alshamy et al. (2025), Kottara and Zaridis (2024) and Al Matari et al. (2024). The guide to artificial intelligence practices in the educational process (Ministry of Education, 2024) was also consulted. The questionnaire, in its initial form, consisted of two parts: the first part included demographic data for the study sample members (gender, academic rank, years of experience, and college). The second part consists of two dimensions: The first includes (10) paragraphs that measure the reality of employing artificial intelligence applications in teaching at Nizwa University, and the

second includes (9) paragraphs that measure the obstacles to employing artificial intelligence applications. The three-point Likert scale (high, medium, low) was adopted.

### 3.6. The Validity of the Instrument

Validity refers to the ability of the instrument to measure what a citation was for. (Lynn, 1986). The validity of the questionnaire was verified through the following:

#### 3.6.1. Face Validity

The questionnaire was presented in its initial form to (7) experienced and specialized arbitrators from various universities and educational institutions in the Sultanate of Oman, with the aim of obtaining their opinions and comments on the suitability of the questionnaire phrases, in line with the objectives of the study. The arbitration of the second part, which addressed the reality of employing artificial intelligence applications in teaching, resulted in amending the wording of some paragraphs (2-5). Based on the arbitration process, the study tool became composed of two parts: the first includes general data, and the second addresses the reality of employing artificial intelligence applications in teaching, consisting of (10) paragraphs, and the obstacles to its employment, consisting of (9) paragraphs.

#### 3.6.2. Construct Validity

To examine the construct validity of the

questionnaire, the correlation coefficients between each item and the total score were calculated on (30) male and female academics outside the study

sample. The correlation coefficients ranged from (0.37) to (0.87) as table 2 shows.

**Table 2: Correlation Coefficients Between the Item and the Total Score.**

| Dimension                                                     | Item # | R<br>With total score | Dimension                                                               | Item # | R<br>With total score |
|---------------------------------------------------------------|--------|-----------------------|-------------------------------------------------------------------------|--------|-----------------------|
| The reality of employing artificial intelligence applications | 1      | .67(**)               | The obstacles related to employing artificial intelligence applications | 1      | .60(**)               |
|                                                               | 2      | .86(**)               |                                                                         | 2      | .71(**)               |
|                                                               | 3      | .68(**)               |                                                                         | 3      | .71(**)               |
|                                                               | 4      | .38(*)                |                                                                         | 4      | .80(**)               |
|                                                               | 5      | .79(**)               |                                                                         | 5      | .37(*)                |
|                                                               | 6      | .58(**)               |                                                                         | 6      | .71(**)               |
|                                                               | 7      | .71(**)               |                                                                         | 7      | .69(**)               |
|                                                               | 8      | .87(**)               |                                                                         | 8      | .44(*)                |
|                                                               | 9      | .76(**)               |                                                                         | 9      | .68(**)               |
|                                                               | 10     | .60(**)               |                                                                         |        |                       |

It should be noted that all correlation coefficients were acceptable and statistically significant.

### 3.7. The Reliability of the Instrument

Many statistical tests were performed to assess reliability of data. In the current study, the scale was confirmed by the test-retest method, by applying the

scale and re-applying it outside the study sample consisting of (30) male and female academics. The Pearson correlation coefficient of their ratings was calculated twice. The reliability coefficient was also calculated by the method of internal consistency. These values as shown on table 3 below were considered appropriate for this study.

**Table 3: Reliability Indications for the Dimensions of Each Scale of the Study Tool.**

| Dimension                                                               | Pearson-Correlation Coefficient Values | Cronbach-Alpha Coefficient Values |
|-------------------------------------------------------------------------|----------------------------------------|-----------------------------------|
| The reality of employing artificial intelligence applications           | 0.90                                   | 0.92                              |
| The obstacles related to employing artificial intelligence applications | 0.87                                   | 0.88                              |

It should be noted that all correlation coefficients were acceptable and statistically significant.

## 4. RESULTS AND DISCUSSION

### 4.1. Results Related to the First Question: What Is the Reality of Employing Artificial Intelligence Applications in Teaching in

### Universities from the Perspective of Academics?

To answer this question, the means and standard deviations of the respondents' answers were calculated. Table (4) presents the results, ranking the items in descending order according to their mean scores.

**Table (4): Means and Standard Deviations of the Reality of Employing Artificial Intelligence Applications in Teaching in Universities from the Perspective of Academics.**

| Rank | N | Item                                                                                                                        | Mean | Std. Deviation | Degree of agreement |
|------|---|-----------------------------------------------------------------------------------------------------------------------------|------|----------------|---------------------|
| 1    | 1 | I use AI applications and platforms for planning academic courses.                                                          | 3.75 | 1.10           | high                |
| 2    | 6 | I use intelligent chatbots to respond to students' questions and inquiries.                                                 | 3.71 | 0.95           | high                |
| 3    | 2 | I employ AI applications and platforms in assessment to identify students' strengths and development priorities.            | 3.66 | 1.10           | moderate            |
| 4    | 4 | I utilize AI to provide appropriate solutions for students with limited knowledge and skills, such as using Expert Systems. | 3.65 | 0.93           | moderate            |
| 5    | 3 | I use AI applications and platforms to meet students' diverse educational needs.                                            | 3.62 | 1.08           | moderate            |
| 6    | 5 | I provide students the opportunity to interact with course components through AI-based virtual reality technologies.        | 3.61 | 0.99           | moderate            |

|    |    |                                                                                                                    |      |      |          |
|----|----|--------------------------------------------------------------------------------------------------------------------|------|------|----------|
| 7  | 9  | I enrich lessons with 2D and 3D models and additional information using AI-powered augmented reality applications. | 2.76 | 1.17 | moderate |
| 8  | 8  | I incorporate AI-based educational games to enhance engagement and challenge during instruction.                   | 2.68 | 1.30 | moderate |
| 9  | 10 | I use educational robots in class as instructional tools to facilitate students' learning.                         | 2.65 | 1.24 | moderate |
| 10 | 7  | I use AI tools to convert written content into mind maps, infographics, and diagrams.                              | 2.08 | 1.23 | Low      |
|    |    | The Current Use of Artificial Intelligence Applications                                                            | 3.22 | 0.68 | moderate |

As shown in Table (4), the overall mean score for the reality of employing artificial intelligence applications was ( $M = 3.22$ ,  $SD = 0.68$ ), reflecting a moderate level of use among academics at the University. The most common practices included using AI in planning academic courses ( $M = 3.75$ ) and utilizing chatbots to respond to students' questions ( $M = 3.71$ ), both of which reached a high degree of agreement. Conversely, the lowest levels of use were reported for AI tools that create visual representations such as mind maps and info graphics ( $M = 2.08$ , low) and educational robots ( $M = 2.65$ , moderate).

These results highlight that while academics are increasingly adopting AI in planning and student support, the integration of more advanced applications—such as augmented reality, virtual reality, and robotics—remains limited. This suggests a need for additional training, institutional support, and awareness to expand the scope of AI utilization in teaching and learning processes. The results of this study are consistent with the study of Kottara and Zaridis (2024), which indicated that there is a need to

utilize tools such as virtual reality for more experiential and collaborative learning that creates conditions for a quality educational process and enhances the dyadic relationship between teachers and students. Alshamy et al. (2020) and Al-Saiari et al. (2025) studies also emphasized the importance of implementing ongoing training programs that go beyond basic digital literacy and provide users with the knowledge and skills necessary to effectively use AI tools.

#### ***4.2. Results Related to the Second Question: What Are the Obstacles to Employing Artificial Intelligence Applications in Teaching in Universities from the Perspective of Academics?***

To answer this question, the means and standard deviations of the respondents' answers were calculated. Table (5) presents the results, ranking the items in descending order according to their mean scores.

***Table (5): Means and Standard Deviations of the Obstacles to Employing Artificial Intelligence Applications in Teaching in Universities from the Perspective of Academics.***

| Rank | N | Item                                                                                                         | Mean | Std. Deviation | Degree of agreement |
|------|---|--------------------------------------------------------------------------------------------------------------|------|----------------|---------------------|
| 1    | 4 | The number of students in a classroom affects the use of AI applications.                                    | 3.87 | 0.98           | high                |
| 2    | 5 | Students possess the necessary digital skills to deal with AI applications.                                  | 3.82 | 1.09           | high                |
| 3    | 3 | Faculty members' awareness of the importance of utilizing AI applications in learning.                       | 3.79 | 1.02           | high                |
| 4    | 1 | I believe that using AI applications requires significant time and effort in preparation and implementation. | 3.74 | 0.93           | high                |
| 5    | 2 | The availability of infrastructure to support the use of AI in education.                                    | 3.69 | 1.06           | high                |
| 6    | 6 | The excessive workload of teachers affects their ability to employ AI applications.                          | 3.61 | 0.97           | moderate            |
| 7    | 8 | Training faculty members to integrate AI applications in teaching.                                           | 3.46 | 0.99           | moderate            |
| 8    | 7 | The high financial cost required to equip classrooms and provide necessary resources for AI integration.     | 3.14 | 1.24           | moderate            |
| 9    | 9 | There is not enough time to employ AI applications during class sessions.                                    | 2.78 | 1.21           | moderate            |
|      |   | Challenges in Utilizing Artificial Intelligence Applications                                                 | 3.55 | 0.61           | moderate            |

As illustrated in Table (3), the overall mean score for the difficulties encountered in using artificial

intelligence applications was ( $M = 3.55$ ,  $SD = 0.61$ ), indicating a moderate level of challenges. The most

prominent obstacles were the large number of students in classrooms ( $M = 3.87$ ), students' digital skills ( $M = 3.82$ ), and faculty members' awareness of the importance of AI ( $M = 3.79$ ). In contrast, the least reported difficulties were time limitations during class sessions ( $M = 2.78$ ) and the financial cost of AI integration ( $M = 3.14$ ).

These findings highlight that while academics recognize the importance of AI and possess basic readiness, they face challenges related to class size, workload, and the resources required for effective AI integration. Strengthening institutional infrastructure, providing training, and addressing financial constraints could help mitigate these difficulties and enhance the adoption of AI applications in teaching and learning. The results of this study are consistent with Vieriu and Petrea (2025), which indicated that the process of integrating AI into university teaching depends largely on the availability and quality of resources, such as technological infrastructure, AI software and tools, faculty training and support, and ongoing technical support. Khalil & Alsenaidi (2024) also

emphasized the importance of a supportive infrastructure to help teachers stay updated with rapid AI advancement in education. Al Matari et al. study (2020) emphasized the need to invest in infrastructure and resources and emphasized that AI applications help to reduce the burden on teachers.

#### **4.3. Results Related to the Third Question: Are There Statistically Significant Differences Attributed to the Variables (Gender, College, Academic Rank) In the Employment of Artificial Intelligence Applications at the Universities?**

To answer this question, the Kruskal-Wallis's test was applied for the variables of academic rank and college, while the Mann-Whitney U test was used for gender. The results are presented below.

##### **4.3.1. Academic Rank**

Table (6) shows the Kruskal-Wallis's test results for the effect of academic rank on the use of AI applications.

**Table (6): Kruskal-Wallis Test Results by Academic Rank for Current Use of AI Applications.**

|                     | N  | Mean Rank | Chi-Square | df | Sig. |
|---------------------|----|-----------|------------|----|------|
| Professor           | 15 | 74.77     | 16.625     | 3  | .001 |
| Associate Professor | 50 | 69.91     |            |    |      |
| Assistant Professor | 85 | 103.79    |            |    |      |
| Lecturer            | 25 | 78.42     |            |    |      |

The results indicate statistically significant differences among ranks ( $\chi^2 = 16.625$ ,  $p = .001$ ). Post hoc analysis using the Sheffé method showed that Assistant Professors ( $M = 3.46$ ,  $SD = 0.668$ ) reported

significantly higher use of AI compared to Associate Professors ( $M = 2.97$ ,  $SD = 0.551$ ) and Lecturers ( $M = 3.00$ ,  $SD = 0.817$ ).

**Table (7): Post Hoc Analysis Using the Sheffé Method for the Effect of Academic Rank Current Use of AI Applications.**

|                     | Mean | Professor | Associate Professor | Assistant Professor | Lecturer |
|---------------------|------|-----------|---------------------|---------------------|----------|
| Professor           | 3.01 |           |                     |                     |          |
| Associate Professor | 2.97 | .037      |                     |                     |          |
| Assistant Professor | 3.46 | -.456     | -.492(*)            |                     |          |
| Lecturer            | 3.00 | .003      | -.034               | .458(*)             |          |

\*Significant at  $p < .05$ .

##### **4.3.2. Gender**

The Mann-Whitney U test results for gender are

presented in Table (8).

**Table (8): Mann-Whitney U Test Results by Gender for Current Use of AI Applications.**

| Gender | N   | Mean Rank | Mean | U        | Z      | Sig. |
|--------|-----|-----------|------|----------|--------|------|
| Male   | 126 | 90.36     | 3.25 | 2789.500 | -0.991 | .322 |
| Female | 49  | 81.93     | 3.14 |          |        |      |

The results indicate no statistically significant differences between males and females in the use of AI applications ( $p > .05$ ).

##### **4.3.3. Colleges**

Table (9) provides the Kruskal-Wallis's test results for the effect of college affiliation.



**Table (9): Kruskal-Wallis Test Results by College for Current Use of AI Applications.**

| College          | N  | Mean Rank | Chi-Square | Df | Sig. |
|------------------|----|-----------|------------|----|------|
| Science and Arts | 70 | 81.79     | 17.131     | 4  | .002 |
| Health Sciences  | 30 | 121.30    |            |    |      |
| Engineering      | 20 | 89.40     |            |    |      |
| Management       | 40 | 80.33     |            |    |      |
| Other            | 15 | 69.00     |            |    |      |

The results show statistically significant differences among colleges ( $\chi^2 = 17.131$ ,  $p = .002$ ). Post hoc comparisons revealed that faculty from the **College of Health Sciences** ( $M = 3.76$ ,  $SD = 0.737$ )

reported significantly higher use of AI applications than those from Science and Arts ( $M = 3.12$ ,  $SD = 0.655$ ), Management ( $M = 3.07$ ,  $SD = 0.635$ ), and other colleges ( $M = 2.98$ ,  $SD = 0.399$ ).

**Table (10): Post Hoc Results Shefee Method by College for Current Use of AI Applications.**

|                  | Mean | Science and Arts | Health Sciences | Engineering | Management | Other |
|------------------|------|------------------|-----------------|-------------|------------|-------|
| Science and Arts | 3.12 |                  |                 |             |            |       |
| Health Sciences  | 3.76 | -.643(*)         |                 |             |            |       |
| Engineering      | 3.22 | -.103            | .540            |             |            |       |
| Management       | 3.07 | .045             | .688(*)         | .148        |            |       |
| Other            | 2.98 | .137             | .780(*)         | .240        | .092       |       |

\*Significant at  $p < .05$ .

The findings indicate that statistically significant differences in AI application use were associated with academic rank and college affiliation, while no significant differences were observed for gender. Specifically, Assistant Professors and faculty members from the College of Health Sciences reported greater use of AI applications. These results suggest that institutional context and professional rank influence the integration of AI more than gender differences, highlighting the importance of targeted support and resources for broader adoption across ranks and colleges. This result is consistent with the study of Jomaa et al. (2025), which indicated that gender is not statistically significant to the use of AI tools in teaching.

## 5. RECOMMENDATION

- Effective training programs for academics should be developed and implemented, focusing on advanced AI applications, to expand its use in teaching and learning processes. Institutional support must be comprehensive and integrated, encompassing technical empowerment and resource provision. This can be achieved by adopting flexible educational models that make AI a partner in improving academic work efficiency.
- Additional studies should be conducted to identify academics' attitudes toward the use of virtual and augmented reality (VR and AR), the effectiveness of using artificial intelligence applications in improving the quality of university

education, and the impact of artificial intelligence in reducing the teaching load on faculty members.

### 5.1. Summary

The topic of artificial intelligence and its supporting applications in academic work has become an important and indispensable aspect for these universities. On the one hand, in terms of global university rankings and the need to ensure quality, the use of artificial intelligence is an important criterion in determining that level of quality. Furthermore, the rapid pace of technological development in this era requires academics to keep up with this development in a manner appropriate to different generations.

For all these reasons, this study sought to investigate the reality of the use of artificial intelligence applications at the University of Nizwa from the perspective of a group of academics, while also revealing the obstacles that hinder their use of these applications. The sample consisted of 179 academics from various disciplines. The study found that academics expressed an average level of use of these applications, with no differences between academics based on gender, but rather differences based on discipline. This result requires the university and academics to do more to support the use of artificial intelligence applications and overcome the challenges expressed by the study sample, the most important of which is increasing training on these applications.

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