



RESEARCH ARTICLE

Section: *Literature, Linguistics & Criticism*

The use of artificial intelligence in research and education in light of Saudi Arabia's Vision 2030 "Usage and Challenges"

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ABSTRACT

This study explores the current applications of Artificial Intelligence (AI) in Saudi universities and research institutions, emphasizing its role in enhancing educational outcomes and research productivity. Using a theoretical analytical approach, the research examines literature and national strategies to assess AI integration in light of Vision 2030. Supported by initiatives like SDAIA, AI adoption is increasingly essential. Nevertheless, challenges such as data privacy, ethical concerns, faculty readiness, and infrastructure limitations continue to hinder full implementation.

KEYWORDS: artificial intelligence, education, digital transformation, research, vision 2030

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Introduction

The world has witnessed a radical transformation in various fields of knowledge in recent years, thanks to the rapid advancement of artificial intelligence technologies. This field has increasingly played a role in supporting and developing scientific research processes, whether by accelerating data analysis, improving the quality of results, or facilitating access to knowledge sources. This technological advancement has reflected on academic and research institutions, prompting many researchers and faculty members to explore the horizons of employing artificial intelligence in their fields of work (Gridach & Nanavati, 2025). Artificial Intelligence (AI) is defined as “intelligence exhibited by machines and programs that mimics human cognitive abilities and work patterns, such as the ability to learn, reason, and react to situations not pre-programmed in the machine.” Artificial intelligence technologies have witnessed rapid development in the modern era, making them an essential element in various fields. Artificial intelligence has become present in daily applications such as voice assistants and translation systems, as well as in academic fields by supporting educational and research processes (Taherdoost & Madanchian, 2025: 3-6).

Since the launch of Vision 2030, the Kingdom of Saudi Arabia has prioritized artificial intelligence and research in it and through it. Among the 96 goals of the vision, more than 60 goals are directly or indirectly related to artificial intelligence and modern technologies. As a result, the Kingdom has ranked sixth globally in the United Nations e-Government Development Index, jumping 25 positions and surpassing the 2024 target set at 26th place, and approaching the 2030 target set at 5th place. Its ranking in the digital services index is as follows: first at the regional level, second among the G20 countries, and fourth globally. And its ranking in the sub-indicators of digital government: first globally in open government data, first globally in digital government skills, and seventh globally in the e-participation index (<https://www.vision2030.gov.sa/ar/annual-reports>).

From this standpoint, the **research problem** emerges: What are the faculty members' attitudes towards the use of artificial intelligence in scientific research and education in light of Vision 2030? What challenges do they face? This issue branches out into several questions: It branches out into sub-questions regarding the extent of professors' awareness of artificial intelligence applications in education and research, what they perceive as benefits or obstacles, and what they propose as support measures to enhance the integration of these technologies. As for the justification for choosing the topic, it lies in the contemporary technological revolution that has made it necessary to study the readiness of educational institutions for this leap. Despite the increasing global interest in artificial intelligence in higher education, which is reflected in the doubling or tripling of related academic publications in 2021 and 2022 compared to previous years, there is an urgent need to examine the uses of artificial intelligence by faculty members in Saudi universities for scientific research and education in light of the national vision.

The importance of the research lies in its foresight of opportunities to leverage artificial intelligence in improving the quality of education and scientific research, in line with the objectives of Saudi Arabia's Vision 2030. And it provides recommendations that can benefit decision-makers in developing policies to support digital transformation in Saudi universities.

Study Objectives

The current study starts with a major goal that “The Use of Artificial Intelligence in Research and Education in light of Saudi Arabia's Vision 2030.” A group of sub-goals is linked to this goal:

- Assessing faculty members' awareness and comprehension of the fundamentals of artificial intelligence
- Determining the primary domains in which AI is used in research and teaching activities from their point of view
- Tracking the applications and difficulties associated with implementing these technologies
- Making suggestions to improve the application of AI in scientific and educational research.

Literature Review

In recent years, there has been an increasing interest from researchers in studying the application of artificial intelligence in the fields of education and scientific research, especially in the Saudi context, which is witnessing major digital

transformations under the Vision 2030. Previous studies have addressed this topic from multiple aspects, most notably the extent of artificial intelligence use in academic environments, faculty members' attitudes towards it, in addition to the challenges that hinder the effective use of artificial intelligence technologies in education and research.

These studies have shown that there is an increasing awareness among institutions and individuals of the potential of artificial intelligence to improve the quality of educational outputs and enhance the performance of scientific research. However, the variation in the degree of adoption is attributed to personal and institutional factors such as technical competence, institutional support, and awareness of artificial intelligence tools, in addition to obstacles related to language, ethics, and the limited number of benefiting disciplines. Some studies have also confirmed that national digital transformation programs, led by entities such as the Saudi Data and Artificial Intelligence Authority (SDAIA), have played a pivotal role in creating a regulatory and legislative environment that encourages the use of artificial intelligence in line with the objectives of Vision 2030.

Wenhan Lyu & Shuang Zhang Understanding the Practices, Perceptions, and (Dis)Trust of Generative AI among Instructors: A Mixed-methods Study in the U.S. Higher Education (2025), Generative AI (GenAI) has brought opportunities and challenges for higher education as it integrates into teaching and learning environments. As instructors navigate this new landscape, understanding their engagement with and attitudes toward GenAI is crucial. We surveyed 178 instructors from a single U.S. university to examine their current practices, perceptions, trust, and distrust of GenAI in higher education in March 2024. While most surveyed instructors reported moderate to high familiarity with GenAI-related concepts, their actual use of GenAI tools for direct instructional tasks remained limited. Our quantitative results show that trust and distrust in GenAI are related yet distinct; high trust does not necessarily imply low distrust, and vice versa. We also found significant differences in surveyed instructors' familiarity with GenAI across different trust and distrust groups. Our qualitative results show nuanced manifestations of trust and distrust among surveyed instructors and various approaches to support calibrated trust in GenAI. We discuss practical implications focused on (dis)trust calibration among instructors.

Maria Lgaz & Elaheh Yadegaridehkordi Factors influencing academic staff satisfaction and continuous usage of generative artificial intelligence (GenAI) in higher education (2025), Generative Artificial Intelligence (GenAI) tools hold significant promises for enhancing teaching and learning outcomes in higher education. However, continues usage behavior and satisfaction of educators with GenAI systems are still less explored. Therefore, this study aims to identify factors influencing academic staff satisfaction and continuous GenAI usage in higher education, employing a survey method and analyzing data using Partial Least Squares Structural Equation Modeling (PLS-SEM). This research utilized the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Expectation Confirmation Model (ECM) as its theoretical foundations, while also integrating ethical concerns as a significant factor. Data was collected from a sample of 127 university academic staff through an online survey questionnaire. The study found a positive correlation between effort expectancy, ethical consideration, expectation confirmation, and academic staff satisfaction. However, performance expectancy did not show a positive correlation with satisfaction. Performance expectancy was positively related to the intention to use GenAI tools, while academic staff satisfaction positively influenced the intention to use GenAI. The social influence did not correlate positively with the use of GenAI. Security and privacy were positively associated with staff satisfaction. Facilitation conditions also positively influenced the intention to use GenAI. The findings of this study provide valuable insights for academia and policymakers, guiding the responsible integration of GenAI tools in education while emphasizing factors for policy considerations and developers of GenAI tools.

The study by Atiyah Al-Ghamdi on faculty members' perceptions of the role of artificial intelligence in developing academic performance at King Saud University (2024), aimed to understand faculty members' perceptions of the role of artificial intelligence in developing academic performance at King Saud University and the requirements for its employment. It also sought to determine whether there were statistically significant differences in their responses attributed to variables such as academic degree and years of experience. The descriptive survey method was used, and the study sample consisted of 169 faculty members at King Saud University. The study tool comprised a questionnaire consisting of two axes: the first axis was academic performance, which included three areas of academic performance (teaching, research, and community service), and the second axis was the requirements for employing artificial intelligence in developing academic performance. The study results showed that faculty members' perceptions of the role of artificial intelligence in

developing academic performance were generally rated as (high), with their perceptions of research performance development rated as (very high), and teaching and service performance development rated as (high). The results also indicated that there are requirements of (very high) importance for employing artificial intelligence in developing academic performance at King Saud University. Additionally, the results showed statistically significant differences in faculty members' perceptions of the requirements for employing artificial intelligence in developing academic performance attributed to the variable of years of experience, favoring those with less than 10 years of experience, while no statistically significant differences were found in their perceptions of the role of artificial intelligence in developing academic performance attributed to the variables of gender and academic rank. The research concluded with a set of recommendations and suggestions.

Additionally, the research conducted by Mohamed Fteiha and Anas Najdawi on faculty members' knowledge and attitudes on artificial intelligence (AI): a case study in higher education(2024), The study was conducted to improve our knowledge of the current level of knowledge and attitudes towards artificial intelligence among university faculty members at Abu Dhabi University. Method: A questionnaire containing 35 items was distributed to 116 faculty members (n=116) using the descriptive approach method. It was found that the perceptions of faculty members at Abu Dhabi University about their level of knowledge about artificial intelligence were at a high level, with an arithmetic average of 4.03. Results: It was found that the level of their attitudes towards artificial intelligence was also at a high level with an average of 3.82. Conclusion: Findings have confirmed that the level of knowledge of female faculty members and their attitude towards using artificial intelligence is higher than the level of knowledge of male faculty members. Depending on the category of college (in favor of the Law College) and finally, there was no statistical significance according to academic position.

The study by Ahmed Al-Kabeer and Hegazy Yassin on the use of artificial intelligence tools in scientific research: an analytical study in 2023, aimed to identify the artificial intelligence tools that can be utilized in the scientific research process, explore ways to benefit from these tools, and identify the main challenges faced by faculty members and researchers in the field of libraries and information regarding the use of artificial intelligence tools and their benefits in the field of scientific research. The study relied on the descriptive-analytical method and the electronic questionnaire as a tool for data collection. The study sample consisted of 47 members representing all academic staff specialized in the field of libraries and information. The study reached several findings, the most important of which were: Self-learning was the most frequently mentioned method for acquiring knowledge using artificial intelligence tools, with a percentage of 47.9% of the total choices made by the study sample members. The most important AI tools used for searching and obtaining information sources were Google Scholar, with a percentage of 54.7% of the study sample. Additionally, one of the most important AI tools used for searching within files and texts and obtaining them was Data Search, with a percentage of 47.2% of the study sample, among other results.

While Asmaa Lotfy's study on the attitude towards the use of artificial intelligence applications and its relationship with professional identity and job engagement among faculty members in(2023), indicated the level of attitude towards the use of artificial intelligence applications among faculty members, the relationship between the attitude towards the use of artificial intelligence applications and professional identity and job engagement, the possibility of predicting the attitude towards the use of artificial intelligence applications through professional identity and job engagement, and the differences in the attitude towards the use of artificial intelligence applications according to gender, specialization, academic degree, and years of experience. The research involved 206 faculty members; the research tools consisted of two scales: the attitude towards the use of artificial intelligence applications and professional identity (both prepared by the researcher), and the job engagement scale (prepared by Hussein, 2021). The results revealed a statistically significant high level of inclination towards using artificial intelligence applications among faculty members, and a statistically significant positive relationship between the inclination towards using artificial intelligence applications, professional identity, and job engagement. Additionally, it is possible to predict the inclination towards using artificial intelligence applications in light of professional identity and job engagement. There were statistically significant differences between the average scores of male and female faculty members in the "evaluation" field and the overall score for the inclination towards using artificial intelligence applications, with a tendency towards females. There were also statistically significant differences between the average scores of faculty members with theoretical and practical specializations in the "evaluation" fields, And "scientific research and communication"

and the overall degree of attitude towards the use of artificial intelligence applications in the direction of those with theoretical specializations; and the existence of statistically significant differences between the average scores of faculty members in the fields of “teaching” and “scientific research and communication” and the overall degree of attitude towards the use of artificial intelligence applications with different academic degrees (Professor - Assistant Professor - Lecturer); and the existence of statistically significant differences between the average scores of faculty members in the “field of scientific research and communication” with different years of experience (less than 10 years - more than 10 years). The research results were discussed, and some recommendations and proposed research were presented.

It is clear from the above that modern literature agrees on the promising potential of artificial intelligence in improving higher education and scientific research, but at the same time, it reveals real challenges that need to be addressed. The framework of results derived from these studies forms a solid foundation to build upon in our case study, which will focus on the attitudes of faculty members in the Arabic Language Department towards the use of artificial intelligence. The current research will benefit from the methodologies and results of those studies when designing its tools and analyzing its data, and it will also seek to confirm or refute whether the trends observed globally and in the Arab world apply to the local context of Imam Abdulrahman bin Faisal University.

Methodology

This study adopts a **theoretical analytical approach**, relying on an in-depth review and critical analysis of previous literature, national strategic documents, and relevant theoretical frameworks related to the use of artificial intelligence in research and education. The purpose of this approach is to explore existing knowledge, identify conceptual trends, and synthesize insights in light of the goals and pillars of Saudi Arabia’s Vision 2030. Through this method, the study aims to build a conceptual framework that highlights the potential roles, opportunities, and challenges of AI integration in the Saudi educational and research contexts.

Theoretical Contribution

This study makes several theoretical contributions to the growing body of literature on artificial intelligence in education and research. **Firstly**, it situates AI integration within the specific sociopolitical and economic context of Saudi Arabia’s Vision 2030—an aspect that remains largely underexplored in current research. **Secondly**, the paper proposes a conceptual framework that synthesizes key factors influencing the adoption and effectiveness of AI in both educational and research settings. These factors include institutional readiness, digital infrastructure, regulatory policies, and cultural attitudes toward technology. **Thirdly**, by bridging insights from technology adoption theories with national strategic goals, this study expands the theoretical discourse beyond generic models and introduces a localized, policy-aware perspective. This offers a novel lens for understanding AI implementation in emerging economies. Below we present some relevant points which are:

Artificial intelligence (AI)

First, it is necessary to clarify some basic concepts related to artificial intelligence. Generally, artificial intelligence is classified in terms of its capabilities into two main types: narrow (weak) artificial intelligence, which is intelligence directed at performing very specific tasks under a narrow range of conditions (such as recommendation systems or playing chess), and general (strong) artificial intelligence, which possesses a broad ability to learn any intellectual task that a human can perform (which is still largely hypothetical). Currently, most applications of artificial intelligence fall under the former category, used in education and scientific research within the scope of narrow artificial intelligence; that is, specialized systems that can perform certain tasks more efficiently than humans in those tasks. Machine Learning and Deep Learning technologies are among the most important branches of modern artificial intelligence, where Machine Learning algorithms focus on building systems that learn from data and gradually improve their performance with the accumulation of experience. Although all machine learning is a form of artificial intelligence, the reverse is not necessarily true; artificial intelligence is broader in scope and also includes expert systems, logical systems, and more (Collins & Dennehy, 2021: 10-12).

Vision 2030 and Artificial Intelligence

The Kingdom has distinguished itself in the world of artificial intelligence, being the first entity to receive the ISO 23 certification and ranking third globally according to the Industrial AI Policy Observatory. It is ranked 11th globally according to the Global AI Safety Index and 14th globally, having jumped 17 positions among 83 countries according to the Global AI Index. It is also the most awarded in terms of medals, having won 22 medals in the WAICY youth AI competition among 129 countries (<https://www.vision2030.gov.sa/ar/annual-reports>)

The Saudi Data and Artificial Intelligence Authority (SDAIA) is almost the sole entity in the Kingdom responsible for data and artificial intelligence, including big data. It serves as the national reference for everything related to their regulation, development, and handling. It holds the original jurisdiction over all matters related to operations, research, and innovation in the field of data and artificial intelligence (<https://sdaia.gov.sa/ar/SDAIA/about/Pages/About.aspx>)

Uses of Artificial Intelligence in Education and Scientific Research

In the context of higher education and research, practical applications of artificial intelligence can be classified into main areas according to the nature of the functions they perform. Here are the main classifications of AI applications in higher education, with illustrative examples: (Brown & Paul, 2024)

- **Assessment and evaluation:** Using artificial intelligence in grading tests, analyzing answers, and providing feedback to students automatically. Automated grading systems are capable of evaluating multiple-choice tests as well as essay questions using natural language processing techniques, which alleviates the burden on the professor and speeds up the announcement of results. These technologies allow faculty members to focus more on improving teaching methods instead of being preoccupied with the routine tasks of evaluation.
- **Early prediction of student performance:** Machine learning algorithms are employed to analyze student performance data (such as previous grades, interaction rates, and academic background) with the aim of predicting students at risk of falling behind or dropping out early. These predictions provide the possibility of proactive interventions to assist students through customized support plans, contributing to improved student retention and completion rates.
- **Intelligent Assistant (Educational Agent):** This category includes chatbots or virtual assistants based on artificial intelligence that can interact with students and faculty. The intelligent assistant responds to common student inquiries around the clock (such as questions about lecture schedules or assignment submissions), manages educational materials on learning platforms, and facilitates communication between students and their professors. For example, some universities have adopted chatbots to answer administrative and academic questions from new students, which has alleviated the pressure on academic advisors and student affairs staff.
- **Intelligent Tutoring Systems (ITS):** These are advanced educational systems that use artificial intelligence to provide personalized, adaptive education for each student. Intelligent tutoring systems analyze the student's level and learning methods, then adapt the content, pace of explanation, and depth of examples according to their individual needs. This provides each student with a personalized educational path that addresses their weaknesses and enhances their strengths. Many studies have proven the effectiveness of this approach in improving the acquisition of knowledge and skills compared to standardized teaching methods for everyone.
- **Learning and Student Affairs Management:** Artificial intelligence technologies are employed to enhance the efficiency of academic administrative processes, such as smartly scheduling classes to avoid conflicts and accommodate the preferences of the largest number of students, and tracking student progress through dashboards that alert academic advisors to cases of students needing additional support. These technologies also assist in allocating resources (such as classrooms and laboratories) based on course enrollment analytics, thereby supporting data-driven decision-making. The role of artificial intelligence in enhancing the efficiency of managing educational institutions has become clear and cannot be overlooked in future planning.

The Perceived Benefits of Integrating Artificial Intelligence

Faculty members – those with a positive outlook – agree on a number of benefits and advantages that they believe artificial intelligence can offer in the field of university education and scientific research. Among the most prominent benefits that have been stated or observed through studies: (Ampong, 2024: 50-55).

- **Improving the quality of learning and teaching:** Many professors believe that artificial intelligence tools open the door to more effective and efficient education. In terms of teaching, intelligent systems enable personalized education that matches each student's level, leading to an increase in comprehension and understanding among a broader range of students. 84% of university lecturers surveyed in one study indicated that they agree that artificial intelligence is “an effective tool for personalizing educational experiences for each learner”. This perception is based on experiences or familiarity with adaptive learning platforms that employ algorithms to identify students' weaknesses and provide them with additional exercises. On the other hand, smart technologies help faculty members themselves in developing their teaching methods; for example, learning analytics systems can provide professors with feedback on students' interaction patterns with online content, allowing them to identify which parts are harder to understand and which are more engaging for them. Such valuable information enables the professor to improve their content and teaching method based on objective evidence.
- **Promoting equity and inclusivity:** Providing high-quality education to all students – regardless of their backgrounds – is a primary goal in higher education, and many faculty members believe that artificial intelligence can be a great aid in this regard. A recent study reported that professors ranked achieving greater equity in education as the most anticipated benefit of artificial intelligence. Equity here means enabling less fortunate or needier students to catch up with their peers. For example, students who face learning difficulties or certain disabilities can benefit from AI-supported tools that provide alternative communication and additional support for them. University professors in some surveys indicated that they expect educational institutions to provide educational AI tools for everyone to support first-generation college students or those with special needs, reflecting an ethical commitment to achieving equity in educational opportunities.
- **Increasing research and administrative efficiency:** Many academics believe that artificial intelligence can enhance the efficiency of academic performance in both its educational and research aspects. At the research level, it has become possible to use machine learning algorithms to analyze vast amounts of research data in a short time, as well as to conduct complex statistical studies or simulate experimental models at a speed that surpasses what researchers used to take manually. This means accelerating the pace of scientific research and allowing for a focus on interpreting results and deriving theories instead of being preoccupied with lengthy calculations. Experiments have already begun using what is called the “smart research assistant,” capable of reviewing scientific literature and suggesting potential relationships between them, as seen in research, which could change the landscape of scientific research in the future. Administratively, business intelligence and data analytics supported by artificial intelligence help in making data-driven decisions within universities, starting from distributing the research budget among departments based on their expected productivity, to managing lecture schedules as previously mentioned. Some faculty members who participated in academic committees found that the analytical AI reports helped them formulate better policies (for example, identifying courses that need additional support or that can be offered through blended learning).
- **Reducing routine burdens and increasing focus on intellectual tasks:** Another outcome agreed upon by many professors is that using artificial intelligence systems in routine academic tasks will alleviate the administrative burdens on faculty members' shoulders. Instead of spending long hours grading assignments or preparing statistical reports on students' grades, automated systems can perform these tasks quickly and with high accuracy. One of the professors participating in the field study commented on this by saying that he hopes “artificial intelligence will give him an extra two hours each day that he used to spend on administrative tasks, so he can invest that time in developing his academic material and direct interaction with students.” And this point specifically makes many faculty members welcoming of the technology, as they see it as a means to focus on the essence of their academic work (teaching, advising, and research) and to rid themselves of secondary burdens that, while necessary, do not utilize their expertise in the best way.

In summary, the positive image that faculty members paint regarding the benefits of artificial intelligence is that it serves as an enabler for them and their students; it allows professors to enhance the quality of their teaching and expand the scope of their research creativity, and it enables students to receive a more personalized education that meets their needs. This optimistic outlook is supported by early evidence from actual applications that have achieved success, but it remains ambitious and requires the necessary conditions to transform it into a tangible reality in our universities.

- **Challenges from the perspective of faculty members regarding the teaching process** Despite the numerous expected benefits, the study did not overlook the concerns and reservations expressed by faculty members regarding the use of artificial intelligence. In fact, it became clear that the adoption of smart technologies in the academic environment is accompanied by legitimate professional and educational concerns that need to be addressed. Among the most prominent concerns that emerged in the research findings (and are consistent with other research results): (Jafari & Vahid , 2024 : 123-127).

Undermining the role of the professor and reducing human interaction: Some faculty members expressed their concern that excessive reliance on artificial intelligence systems could diminish their central role in the educational process. For example, if students rely on chatbots for answers and guidance, their direct interaction with the professor may decrease, which affects the building of the interactive educational relationship that is essential for transferring experiences and values. There is also concern about the idea of “replacing” the professor partially or entirely with technology in some tasks; some believe that the university might be tempted in the future to reduce the number of faculty members to save costs as long as AI systems can fill part of the educational process. These concerns, although currently hypothetical, are present in the minds of professors and prompt them to question the limits of technology use and the necessity of preserving the human element’s status in the educational process as an indispensable role model and guide.

- **Negative impacts on students’ skills:** Many faculty members expressed their concern that the irrational use of artificial intelligence could negatively affect students’ thinking and innovation skills. For example, if a student can obtain a ready-made essay or solve a complex problem with the push of a button using one of the smart tools, their motivation for self-learning and effort in analysis and problem-solving may decrease. The results of the Algerian study clearly confirmed this concern, as the professors there expressed fears that the influx of ready-made information through artificial intelligence would hinder students’ creativity and critical thinking. These are concerns related to the essence of the educational process: Will we graduate students who rely on their minds or on machines? From another related angle, some fear the spread of academic dishonesty if students misuse artificial intelligence tools, such as generating ready-made research or solving homework assignments with them, making it difficult for professors to assess the true level of their students (this point pertains to academic integrity, which has become a real challenge with the emergence of tools like ChatGPT in the educational arena).
- **Privacy and data security:** Faculty members emphasized the need to pay attention to the issue of protecting the confidential data of students and professors when using artificial intelligence platforms. Many of these tools require the collection of a large amount of data (such as grades, performance characteristics, and click patterns on educational platforms), raising questions about where this data is stored and who has access to it. The professors expressed their concern about ensuring that students’ privacy is not violated and that data is not exploited for purposes other than legitimate academic use. These concerns align with what studies have indicated, that data security and privacy are among the most prominent challenges of using artificial intelligence in education (researchgate.net). Some are also concerned about relying on external closed-source AI software that the university cannot control, which could expose it to cyberattacks or the leakage of sensitive information.
- **Ethics and Bias:** Artificial intelligence also raises ethical questions about how it makes decisions and the outputs it provides. Faculty members have pointed out the necessity of being cautious of the inherent biases in AI algorithms, which may lead to unfairly favoring one group over another (for example, an evaluation algorithm that may culturally favor a certain language or a specific knowledge background). Therefore, professors feel the need to ensure the fairness and transparency of these systems before adopting

them. The ethical question also arose regarding the limits of using artificial intelligence in research: Is it correct to consider research prepared by artificial intelligence as original scientific research? And how are intellectual property rights preserved in results where the machine has significantly contributed to their production? These issues, although philosophical in nature, affect professors' acceptance of the technology, as some show caution towards it until clear ethical and legal frameworks are established to regulate it.

- **Lack of knowledge and training:** Many of the previous concerns are exacerbated by the insufficient technical familiarity of some faculty members with how AI tools work and how to effectively integrate them into teaching without side effects. Several professors admitted during the interviews that their knowledge of artificial intelligence is “superficial and limited,” and that they are not confident in their ability to harness the technologies for the benefit of their students without prior training. This feeling of technological unpreparedness makes some adopt a wait-and-see approach instead of taking the initiative. The global study (2024) confirmed this point, considering the lack of technical culture among some professors and students as one of the biggest challenges to the successful integration of artificial intelligence.

Challenges from the Perspective of Faculty Members Regarding Scientific Research

Faculty members face a set of challenges in using artificial intelligence technologies in scientific research, despite the great potential these technologies offer. Among the most prominent of these challenges:

First – Personal obstacles: Cognitive and skill-related obstacles manifested in Lack of technical knowledge and skills: many faculty members lack the knowledge or technical skills necessary to understand or effectively use artificial intelligence tools; this necessitates continuous training for the academic staff and their qualification to use artificial intelligence tools effectively to keep up with the rapid developments in this field.

Also, the lack of sufficient experience in using artificial intelligence applications and the lack of technical skills to choose the best artificial intelligence tools in scientific research. Choosing the appropriate tool that fits With the research problem, its objectives, and methodology, it requires knowledge and discernment of the best software and applications, as well as technical and computational skills to handle artificial intelligence programs. Some are also concerned about losing accuracy or originality when using text generation or automatic analysis tools, which makes them hesitant to adopt them. Enhancing faculty awareness of the benefits of artificial intelligence can significantly contribute to improving the efficiency of scientific production, increasing innovation opportunities, and accelerating research processes in general (Liu & Zhang, 2024 : 105).

Not Knowing the Language Supported by AI Tools

Some faculty members suffer from a lack of awareness about the languages supported by AI tools, which poses an obstacle to their use, especially in scientific research. Many tools heavily rely on the English language, while researchers may need support for Arabic or other languages, whether in analysis, translation, or interaction. The lack of sufficient information about the language capabilities of the tool (such as translation accuracy, text generation, or context understanding in non-English languages) may lead researchers to refrain from using it. This challenge particularly affects researchers who write or publish their work in multiple languages or in fields that heavily rely on language. As a result of the uncertainty regarding the tool's efficiency in multiple languages, this challenge serves as a barrier that discourages academics from using artificial intelligence tools in scientific research. Most tools primarily support the English language, while there may be a need to use them in other languages such as Arabic, which limits their effectiveness (Almalki & Khan, 2024)

Challenges Related to the Specialization

Some fields may not easily align with AI applications (such as arts, philosophy, or literary studies), which means there is an urgent need to develop AI tools specific to certain disciplines.

- **Cultural and Behavioral Obstacles** - Lack of awareness of the advantages of artificial intelligence in scientific research:

The lack of awareness among faculty members about the advantages of artificial intelligence is one of the most prominent challenges hindering the employment of these technologies in scientific research within the university environment. Despite the rapid advancements in artificial intelligence technologies, many academics are still unaware of the significant potential these tools can offer in accelerating and improving the quality of research processes.

- Resistance to change the resistance of some faculty members to changing traditional methods in scientific research, as they see artificial intelligence as a threat to their traditional approach. Which generates the fear of losing the research role or having it replaced by technology. Ethical concerns (Ain & Sharma, 2024).
- **-Ethical and Academic Concerns:** It relates to the concern about using artificial intelligence tools in scientific research, which leads to plagiarism or scientific theft; or the violation of intellectual property rights and data privacy. And the fear that excessive reliance on artificial intelligence will lead to the loss of research capabilities such as critical and creative thinking, the ability to compose, and the extinguishing of the passion for reading, exploration, and investigation (Zhao & Wang, 2023: 341-353).
- **The university environment-Technical obstacles:** Weak technological and digital infrastructure , some educational institutions lack advanced digital infrastructure that allows for the efficient application of artificial intelligence technologies; this means there is a need to provide integrated educational systems that support artificial intelligence, such as smart learning management systems. The lack of modern devices or strong internet networks that support the efficient use of artificial intelligence tools.
- **The Absence of Direct Technical Support:** absence of specialized technical support poses a significant obstacle for faculty members when using artificial intelligence tools in scientific research, especially when facing technical problems. Some institutions do not provide qualified technical support teams in the field of artificial intelligence; the lack of specialized personnel in technical support for faculty members. Faculty members when facing problems in using AI tools; which forces researchers to rely on themselves to learn the tools or seek external solutions. Moreover, the lack of maintenance and updates, along with the absence of an internal reference for guidance or training, increases the difficulty of sustainable use of these tools. This lack of support may lead to frustration or a complete withdrawal from using artificial intelligence, even if those tools are useful (Fernández & López , 2025: 175-191).
- Lack of integration of tools with university systems: difficulty of integrating artificial intelligence tools with learning management systems such as (Blackboard).
- Difficulty in evaluating the effectiveness of the tools: it is sometimes difficult to ensure the effectiveness of artificial intelligence tools in improving scientific research outcomes and supporting the research environment and research teams, for the development of scientific research and ways to advance and innovate it; due to the absence of clear standards for continuously evaluating artificial intelligence tools and ensuring their effectiveness (Rahman & Chowdhury, 2024: 92-108).
- **Organizational and Administrative Obstacles** -The absence of clear policies: absence of university regulations or policies governing the use of artificial intelligence in classrooms or in scientific research.
- **Lack of funding and institutional support:** lack of investment in purchasing licenses or developing tools specifically for the university (Alqahtani & Alharthi, 2023: 789-808)
- **Research Obstacles:** lack of specialized tools for certain fields, lack of artificial intelligence tools that meet the needs of certain fields such as humanities or religious studies.
- **Difficulty in verifying the reliability of the outputs:** challenge lies in the difficulty of verifying the accuracy of the results produced by artificial intelligence tools, especially in precise research work (Nevárez & Elizondo, 2025).

When analyzing these concerns, it can be said that faculty members embrace technology with open minds and open eyes as well. They recognize its advantages, but at the same time, they are sensitive to its potential risks on educational and ethical levels. And this is a positive thing, as it means that the integration of artificial intelligence – in order to succeed – should be done in close collaboration with the faculty members themselves, by listening to their concerns and addressing them in the implementation steps. These results also indicate a responsibility

on the part of university administrations to reassure professors and provide them with the knowledge and tools that make their experience with artificial intelligence safe and fruitful. Without addressing these challenges, a portion of the faculty may remain hesitant or limit their use of technology, resulting in missed opportunities for significant improvement and development.

- There is no doubt that the Kingdom of Saudi Arabia is one of the most supportive countries of scientific research, having anticipated and addressed the challenges through what Sadaia is doing, as it is the official entity that collects national data and presents it in a legal manner, as stated on the Sadaia website regarding national data.
- The data produced by government and private entities, or received or handled by them, is considered one of the most important national assets that contribute to improving performance and productivity and facilitating the provision of public services. Therefore, the Kingdom seeks to apply the best global practices for national data management policies and controls, governance, personal data protection, and enhancing the value derived from it in making strategic decisions, anticipating the future, and achieving the highest levels of responsibility and transparency. Countries around the world also strive to leverage the value of data as an economic resource that fosters innovation and contributes to supporting economic transformations and enhancing the competitive advantages of nations. At the national level, government entities are collecting and processing vast amounts of data that can be utilized to contribute to economic growth and elevate the Kingdom to a leading position among data-driven economies. In light of Vision 2030, the Kingdom is striving towards a new era that enhances the performance of government entities, increases their transparency and accountability, and encourages economic diversification and the utilization of data-driven services (Emam & El-Din, 2024: 114-123).
- There is no doubt that data is a primary source for social, human, and linguistic research, as Sadaia is also interested in social media and its precise engines that reflect human activity in Saudi society, supporting research in many fields.
- Sadaia has a charter and regulations for the use of this data available on its website, detailing this data, its governance, and its utilization in both the private and public sectors. In 2024, under the patronage of His Royal Highness Prince Mohammed bin Salman bin Abdulaziz Al Saud, Crown Prince, Prime Minister, and Chairman of the Board of Directors of the Saudi Data and Artificial Intelligence Authority - may God protect him - the Saudi Data and Artificial Intelligence Authority “Sadaia” will organize the third edition of the Global AI Summit, featuring over 300 speakers and the participation of numerous AI experts from 100 countries worldwide, during the period from September 10 to 12, 2024 (Aljarallah & Alfadhel, 2025).

Factors Influencing the Variation in Attitudes

The results also revealed the presence of personal and institutional factors that influence the variation in faculty members' attitudes towards artificial intelligence. Not all differences in opinions were random; some could be linked to specific characteristics and determinants. Here are the main factors that demonstrate their impact: (Alnasib, 2024).

- Age and seniority factor: The data indicated that younger professors were generally more enthusiastic about adopting AI technologies compared to their older colleagues. This aligns with the common impression that younger generations are more familiar with technology. Although one study found that the number of years of teaching experience itself was not a very influential factor on the perception of technology, an interaction between age and gender was observed in some of them, where younger male professors were the most enthusiastic and used artificial intelligence in teaching the most. Perhaps this is because this group embraces technology as part of their lifestyle and has a high motivation for experimentation and professional development. Conversely, relatively older professors (those who did not grow up in the digital transformation era) may need more time or greater support to feel comfortable with new technologies. However, it is worth noting that this general trend is not without exceptions; some senior professors were pioneers in introducing technologies to their classrooms, perhaps out of a love for innovation or an awareness of certain benefits.
- Academic specialization and cognitive background: Discussions have shown that the field of specialization

plays a role in shaping the professor's attitude towards technology. Professors in scientific and technical fields (such as computer science and engineering) are usually more understanding and aware of the potential of artificial intelligence, and therefore more supportive of it, while professors in the humanities and arts may hesitate until suitable ways to apply the technology in their fields become clear. This was one of the motivations for focusing our research specifically on the Arabic Language Department, as its professors represent the humanities aspect. And we noticed through some responses that there is a question: "How can artificial intelligence serve the studies of language and literature?" While a computer science professor might see direct applications such as developing algorithms or software, a literature professor might wonder how to employ technology in analyzing or critiquing texts. However, when examples were clarified (such as tools for automated linguistic text analysis or smart databases for manuscripts), humanities professors showed great interest and readiness to experiment. So it can be said that specialization influences to the extent that it provides its holder with a vision of possible applications; once this vision is available even to humanities professors, much of the hesitation disappears.

- **Institutional support and infrastructure:** Factors related to the university environment and its conditions played a clear role in shaping the experience and direction. It was found that professors in institutions that provide strong technical and training support were more frequent and confident in using technologies, while others complained about the lack of this support, which made them less enthusiastic. For example, professors at international universities mentioned that their university provided them with workshops on using AI tools in education and integrated some software into their learning management systems, making it easy for them to adopt the technology as it became part of their available resources. In contrast, some professors in the Arabic Language Department under study reported that the university has not yet provided specific training programs in this field, nor has it adopted any artificial intelligence platform at the institutional level, leaving them to their individual initiatives. Naturally, this affects the extent and enthusiasm of usage. Therefore, the more encouraging the institutional climate is (through clear policies, available technical resources, incentives, and appreciation for innovators), the higher the percentage of supporters and users among faculty members.
- **Self-efficacy in technology:** It has also been shown that the professor's confidence in their personal technical skills is a determinant of their acceptance of technology. Professors who classified themselves as proficient in using computers and software in general were quicker to accept artificial intelligence and did not view it as a major barrier educationaltechnologyjournal.springeropen.com. As for those who acknowledged their weak skills or their need to learn, they were more reserved and perhaps implicitly afraid of failing to use the technology in front of their students. This result aligns with the Diffusion of Innovations theory, which indicates that early adopters of technology are usually highly competent and willing to take risks and learn new things, while others delay until they feel confident in their competence. Through the above, it becomes clear that faculty members' attitudes are not isolated from their personal and institutional contexts. The stance on artificial intelligence is shaped by a combination of factors related to the individual (age, specialization, skills) and the surrounding work environment (university support, availability of technology, presence of training). This highlights the importance of adopting a comprehensive approach when formulating strategies for integrating artificial intelligence, so that these strategies target not only the provision of technology but also the preparation of individuals and the environment to receive it. For example, raising the enthusiasm of a certain group of professors (the older ones or those in specific fields) may require organizing training programs specifically designed for them, taking their needs into account and dispelling their fears. Additionally, building a Community of Practice within the university, where professors exchange experiences about their interactions with artificial intelligence, may help in gradually spreading the enthusiasm for technology from the innovators to the more reserved.

Recommendations and Suggestions

In light of the obtained results and their analysis, the research presents a set of practical recommendations and suggestions that aim to enhance the integration of artificial intelligence technologies in scientific research and the educational process at the level of the Arabic Language Department and the university as a whole. These

recommendations aim to build on existing positive trends and address shortcomings and concerns to ensure maximum benefit from the technologies with minimal negative impacts. Here are the main proposals:

- Implement regular training and professional development programs for faculty members: The university should organize training courses and workshops aimed at enhancing the technical and digital competencies of faculty members in the field of artificial intelligence. These training sessions should include an introduction to the fundamentals of technology and its educational and research applications, with the opportunity for hands-on experience with specific tools (such as automated grading systems or text data analysis software). Studies have confirmed the urgent need for such programs; for example, researchers at Cairo University recommended the preparation of intensive training courses for professors to develop their traditional skills in line with the use of artificial intelligence. Investing in developing the professor's technical skills will positively reflect on their confidence in technology and their readiness to apply it, as well as dispel the feeling of unpreparedness that some may have.
- Enhancing technical infrastructure and providing resources: It is essential for the university to ensure the presence of a strong and flexible technical infrastructure that supports artificial intelligence applications. This includes providing modern computers and laboratories equipped with artificial intelligence software, improving internet connectivity speed on campus, and securing the necessary licenses for smart educational programs and tools. Additionally, specialized technical support teams for artificial intelligence should be established to assist faculty members immediately when any technical issues arise. Such steps received explicit recommendations in the studies; one of the findings indicated the necessity of preparing an advanced infrastructure (wireless communications, computers, software) before starting to implement artificial intelligence in teaching. The presence of a ready technological environment will make the integration of smart tools smooth and operationally non-burdensome, encouraging professors to proceed with their use.
- Developing clear institutional policies and ethical frameworks: The study recommends that the college and university establish formal policies to regulate the use of artificial intelligence in research and teaching. These policies should cover aspects such as ensuring fairness and non-bias in any automated evaluation system, protecting the privacy of student data and faculty research, and regulating students' use of smart tools in academic assignments to prevent misuse. A Code of Ethics should also be formulated specifically for dealing with artificial intelligence in higher education, in line with UNESCO principles and global recommendations in this regard. Regional studies have emphasized this aspect; university professors have called for the enactment of ethical laws and regulations to regulate the use of technology in universities. The existence of a clear policy will alleviate professors' concerns and provide them with a reference framework to work confidently within known boundaries, while also ensuring the mitigation of potential negatives.
- Adoption of user-friendly and curriculum-integrated educational AI systems and tools: It is beneficial for the university to centrally adopt some intelligent systems and integrate them into its e-learning platforms. For example, an automated system for correcting written assignments in Arabic, based on natural language processing, can be adopted and used in the Faculty of Arts courses. Similarly, AI-supported study modules may be included in the curriculum (such as a software package for training students in syntax and grammatical analysis in the Arabic language department). The important thing is that these tools have simple interfaces that meet the needs of the professors, so that the professor does not find it difficult to learn how to use them. The easier and closer the technology is to the professor's work environment, the more they will accept it. Therefore, the study recommends collaborating with educational software developers to create or adapt user-friendly artificial intelligence tools that consider the Arabic language and its characteristics. It is also recommended to involve faculty members in the testing phase of these tools and to provide their feedback to ensure their alignment with educational objectives.
- Encouraging a culture of innovation and collaboration among faculty: A supportive organizational culture is a crucial element for the success of any technological initiative. Accordingly, the study recommends efforts to promote a positive culture towards artificial intelligence in the college through interactive activities. Periodic scientific forums and seminars can be organized, featuring professors from various

disciplines to share their experiences with artificial intelligence tools in research or teaching and discuss the benefits and challenges. Such gatherings enhance the exchange of experiences and dispel some fears of the technological unknown. Some researchers have suggested holding conferences and workshops where students and professors participate together on the applications of artificial intelligence in education, which contributes to building a shared understanding and realistic expectations of the role of technology. Additionally, material and moral incentives are important to establish the desired culture; the university can offer incentives and rewards to departments or individuals who present successful initiatives in employing artificial intelligence. For example, an annual award for the best teaching practice supported by artificial intelligence, or additional grants to fund research projects that use smart technologies in their subjects. Such incentives send a clear message that the institution values innovation and wishes to see more of it.

- **Monitoring progress and conducting continuous evaluative research:** Finally, the study recommends the importance of periodically monitoring and tracking the impact of introducing artificial intelligence on the educational and research processes. Internal evaluation studies (or commissioning independent researchers) should be conducted after a period of implementing the recommendations, with the aim of measuring the development in faculty members' attitudes and their actual benefit from the technologies, as well as identifying any new issues that have arisen unexpectedly. Continuous feedback will help decision-makers adjust strategies and update support and training plans according to reality. Harris (2024) pointed out the necessity of tracking the evolution of professors' attitudes towards artificial intelligence over time and introducing new variables in the research for a deeper understanding, which confirms the idea that this field is dynamic and ever-evolving, requiring a continuous review mechanism. Periodic research can also be utilized to compare the status of the Arabic Language Department with other departments or universities locally, opening up opportunities to learn from pioneering experiences and avoid the failures encountered by others.

By implementing the above recommendations in an integrated manner, it is expected that the environment for adopting artificial intelligence at the university will improve, leading to an increase in the use of smart tools by faculty members in their activities over the next few years, and an enhancement in the quality of educational and research outputs. The most important thing is that this transformation occurs in a balanced and responsible manner, so that both the professor and the student benefit from the technology while the educational process continues to uphold its humanitarian and educational goals. As mentioned in a recent article, "Artificial intelligence is not a threat but a tool – akin to a beacon guiding us towards a brighter educational future" infusedinnovations.com. From this perspective, universities should improve the use of this tool through proper preparation and continuous monitoring.

Conclusion

In conclusion, this research shows that the use of artificial intelligence in scientific research and education generally leans towards a positive outlook tempered with critical awareness. We found that the majority of professors recognize the great potential of artificial intelligence in enhancing the higher education experience—whether in terms of personalized learning, improving assessment efficiency, or accelerating the pace of scientific research—and they are ready to benefit from it whenever the appropriate conditions are met. At the same time, these academics do not approach technology with blind admiration; rather, their enthusiasm is accompanied by a healthy degree of caution and scrutiny, as they are keen to discuss the ethical and educational challenges and ensure that technology does not compromise the values and goals of education. The study highlighted several points worthy of reflection. On one hand, the pivotal role of the university institution in steering individual trends emerged; the policies of support, training, and infrastructure either accelerate professors' adoption of artificial intelligence or deter them from it. On the other hand, it has been shown that the professors themselves play the role of leader and partner in this digital transformation process – the success of integrating artificial intelligence will only be achieved through their active participation in its design and implementation, and by taking their needs and concerns seriously. The research concluded with a series of findings, the most important of which is that a positive outlook towards

artificial intelligence is often accompanied by high expectations regarding the improvement of education and research. However, translating these expectations into actual reality requires addressing fundamental barriers related to technical knowledge, regulatory frameworks, and ethics. Hence, the recommendations focus on empowering faculty members (with knowledge and tools) and empowering the supportive environment (with infrastructure and policies) together, to achieve the desired integration. Adopting these recommendations is not a luxury but a strategic investment in the university's future; the world around us is witnessing a rapid shift towards the use of artificial intelligence in education, and it would be unwise to lag behind in this field. And whenever enthusiasm meets empowerment, we will see artificial intelligence transform from just a futuristic idea into a daily reality that enriches the university experience. In conclusion, we affirm that the future of higher education in the era of artificial intelligence is promising, provided that a conscious and thoughtful approach is followed in integrating technologies. Faculty members are the cornerstone of this approach; with their wise guidance, technology can become a powerful enabling tool, whereas neglecting their opinions may turn technology into a source of new problems. Fortunately, our professors – as this study has shown – are aware of both aspects, and they are ready to contribute to shaping the experience in a way that achieves a modern educational vision without compromising the authenticity of the educational process. As it is said: Artificial intelligence in universities is like a torch of light; if we carry it well, it will guide us to a bright future, but if we leave it without guidance, it might burn us. And it is our duty to carry this torch towards a more creative and effective academic tomorrow.

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This research is not part of any academic thesis submitted for the award of a degree. It is an independent work conducted solely for the purposes of academic research and publication.

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