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Assessing the readiness of selected departments at Al-Baha University to integrate artificial intelligence applications in E-learning

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Abstract: As artificial intelligence (AI) continues to redefine educational practices worldwide, universities are increasingly exploring its potential to enhance the effectiveness and quality of e-learning environments. This study aims to assess the readiness of selected departments at Al-Baha University, Saudi Arabia, to integrate AI applications into e-learning by examining the current status of digital learning, institutional capabilities, faculty knowledge, and perceived challenges. Using a descriptive research design, data were collected through structured electronic questionnaires administered to 95 faculty members and 53 e-learning staff, and analyzed using descriptive statistics. The findings reveal that although e-learning implementation is currently strong and supported by ongoing institutional and technological development, the university's preparedness for AI integration remains moderate, particularly in areas related to strategic planning and infrastructure. Faculty members expressed a high willingness to adopt AI tools but demonstrated only moderate levels of actual knowledge. Key barriers included limited training opportunities, lack of a clear institutional strategy, concerns about job replacement, and high implementation costs. Overall, the results indicate a positive inclination toward AI adoption while underscoring the need for strengthened training, strategic direction, and technological investment to ensure effective and sustainable integration of AI in e-learning.

Keywords: *Artificial Intelligence (AI), E-learning application, Faculty attitudes, Digital infrastructure, AI adoption barriers.*

1. Introduction

In the 21st century, technological advancement has been very rapid and has resulted in many changes in all sectors, and the education sector has not been an exception, as it has experienced impressive development and has been growing at an impressive pace in recent years [1]. As per its Vision 2030, the Kingdom of Saudi Arabia has given great attention to the educational sector, considering it as one of the main pillars and measures of a successful and progressive nation. This is evidenced by constant monitoring, the creation of the educational process, and the introduction of technological innovations [2].

Universities are also regarded as one of the earliest schools to pay attention to the enhancement of the educational process and technological advancement [3]. The avoidance of the traditional approach, with the adoption of new teaching techniques, has been increasing as the stakeholders of higher education institutions strive to improve the quality of education [4]. One of the most evident current approaches that universities are trying to introduce into their systems to facilitate the educational process is e-learning [5]. The importance of e-learning is that it offers learning opportunities without regard to time and location, such that no student is denied a right to education. It also lowers the costs involved in traditional learning. In addition, e-learning during the epoch of the gigantic information revolution is a time- and energy-saving activity due to the fact that it contributes to easier access to

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information for learners [6]. More specifically, to improve and develop the e-learning setting and learn how to operate the systems correctly, modern technological tools will have to be integrated into the educational context [7]. One of the broadest-discussed new technologies that are gaining popularity among many researchers recently is Artificial Intelligence (AI), and they are willing to leverage the opportunities of AI in enhancing the effectiveness of the educational process [8]. Likewise, the latest studies dedicated to the notion of artificial intelligence (AI) implementation in educational technologies are aimed at enhancing the e-learning landscape by identifying the structural design factors of e-learning components and their relationship with AI factors and attributes [9]. This is done to develop e-learning environments that comply with the requirements and attributes of learners [8]. One of the spheres where researchers have emphasized the importance of integrating AI in the 21st century is the educational sector, as the questions of Owan et al. [8] and Gayas [10] unveil. AI is considered to be one of the technologies that integrates various forms of electronic learning, enabling a more interactive educational process [11].

It is against this backdrop that AI is highly influential in education in general and e-learning in particular. This was established in the course of the analysis of Rahman et al. [12], who indicated that the adoption of AI and its applications in e-learning has resulted in the qualitative transformation of e-learning practices and technologies. In a similar manner, Li's [13] study also suggested that AI technologies could improve learning among students, support their individual differences, and boost their academic performance in an e-learning setting.

2. Literature Review

2.1. Artificial Intelligence in Education

Artificial intelligence (AI) is defined as a relatively modern branch of computer science intended to develop and design intelligent computer systems, which will mimic human intelligence in terms of functionality and have the capability to carry out tasks in place of humans and behave and act in a manner similar to humans because of reasoned and mathematical means and interactions among them [14]. The theory of artificial intelligence was first introduced in 1956 when John McCarthy came up with the term artificial intelligence at a conference that took place in 1956 at Dartmouth College in the middle of the 20th century [15]. That conference was aimed at the sharing of ideas with researchers and the creation of new fields of study. The institute has since been regarded as the birthplace of AI. In the study by Lin et al. [16] that was carried out to analyze the history of artificial intelligence (AI), its application in the educational sector, and the most effective ways to implement it, the researchers used a systematic review of literature on the topic. The findings indicated that the following spheres are the most important in the implementation of AI in the field of education: automatic grading systems, formative assessment, virtual teachers, personalized learning, adaptive learning, virtual reality, augmented reality, and distance learning. The most suitable ways of implementing AI in education were split into three main points. First, technical aspects, which involve improving information security practices, reflecting on ethical issues, and protecting student privacy. Second, the aspect of implementation, which focuses on the systematic application of AI, its incorporation into scientific theories, and synchronization of its application with the laws governing educational development. Third, practical aspects, which include broadening the field of AI application in education through the adoption of the most efficient new educational applications and providing specialists with training to work with these technologies. The research advised that there is a necessity to use AI applications in learning to facilitate and improve the process. Moreover, Zhao's [17] inductive study also sought to comprehend the conceptual framework of AI and the use of AI applications in education, as well as how AI can be used to facilitate learning. The research was based on theoretical analysis and existing data on the issues of AI. The findings showed that AI applications support student autonomy and individual learning differences. They also enable good communication between learners and learning materials such as books, multimedia, and teachers. The main suggestions were planning the learning space to facilitate the integration of AI. Moreover, the introduction of AI applications would encourage students

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and make them more interested in studying. Finally, the use of AI applications in education at all levels. Moreover, in this descriptive study by Groumpos [15], the objective was to discover the ethical issues in the context of AI integration in higher education. This was achieved through a review of research studies, books, academic journals, and websites. The discussions highlighted some of the essential obstacles to AI application in higher education, such as ethical issues, technical issues, organizational issues (e.g., laws, policies, procedures), training-related issues, and financial issues linked with development costs. The paper suggested that AI should have a legal and ethical paradigm implemented in higher education institutions. The research conducted by Khan et al. [1] also investigated the opportunities and challenges associated with implementing AI-based learning outcomes in Saudi Arabian higher education institutions. Recent articles, book chapters, and review papers published between 2011 and 2022 were analyzed to collect data. The results revealed that one of the main hurdles is that teachers need to acquire new technological expertise to effectively use AI in instruction. Teachers must also learn how to utilize AI and understand its application in universities when implementing AI systems. Successful AI implementation in higher education requires the preparation of technical infrastructure and the provision of adequate resources, including programs, equipment, and training. It is recommended that further investigation should focus on areas such as conducting more experimental research to evaluate the creation of improved learning conditions through AI technologies. Additionally, the literature requires further exploration to understand how AI solutions can be planned and implemented efficiently and effectively.

2.2. Artificial Intelligence in E-learning

E-learning was a term coined in the late 20th century as a result of its numerous benefits in alleviating problems in education. As a result, universities started to embrace it at a high pace. Wagino et al. [5] described e-learning as an educational system that facilitates the learning process through the application of modern technologies, communication tools, and multimedia within the learning environment. It conveys information to students at any time and from anywhere and enables communication between students as well as between students and instructors. Khan et al. [1] used a descriptive analytical investigation to introduce a range of ideas associated with AI and Learning Management Systems (LMS) that universities utilize, highlighting the most significant practices in adopting AI. The findings indicate the application of platforms such as Blackboard and Moodle, as well as the potential of AI applications like chatbots, augmented reality (AR), and virtual reality (VR) in higher education. The study emphasizes that AI plays an important role in enhancing university education. It recommends creating awareness of AI's significance, increasing security levels in educational platforms, and safeguarding online data. In their analytical research, Rashid and Kausik [18] aimed to conceptualize AI and explore its uses in e-learning, particularly how AI may enhance e-learning in Libyan universities. The research involved 15 e-learning unit supervisors and 187 faculty members. The findings revealed that infrastructure problems were the most prominent hindrance, and none of the universities had previously integrated AI into their e-learning processes. Despite interest from faculty and institutions, student knowledge gaps limited AI adoption. The research suggested establishing dedicated AI departments, improving infrastructure, raising stakeholder awareness about AI benefits, and training faculty for successful AI deployment. In addition, Aldosari [19] carried out qualitative research at Prince Sattam University among 30 faculty members with an open-ended question to evaluate views of AI regarding the future of higher education. The results showed that faculty were satisfied with existing levels of technology and the need to continue progress. AI was expected to play an important role in student assessment, grading, participation in activities, program enhancement, quality assurance, virtual learning, and support. Nevertheless, awareness was insufficient about the extended functions of AI. The research suggested raising faculty awareness, envisioning the role of AI in academic roles, as well as conducting additional research on teaching in the era of AI. Moreover, Al-Sobhi [20] also conducted a mixed-method study of the application of AI by 301 faculty members at Najran University. The findings indicated low adoption of AI and significant problems. No

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differences between gender and academic rank (p=0.05) or between usage and challenges were statistically significant. The paper suggested that positive attitudes toward AI should be developed in faculties, that faculty using AI should be incentivized, the learning environment with the necessary tools to facilitate learning should be prepared, technical assistance provided, and workshops on new AI should be held. A research study carried out by Alyazji [21] to explore the role of AI application in facilitating university education in Saudi Arabia in an inductive descriptive-analytical study. The results revealed that AI aids in the retention of learning, the reduction of the information accessibility barrier, and the flexibility of delivery with the use of various formats. It facilitates learning based on the preferences of the students, collaborative learning, as well as smart systems of self-paced advancement. AI improves interaction with students and helps turn the role of the teacher into a coach. The research suggests providing faculty and student training on AI tools, including AI in educational programs, planning the infrastructure, and creating awareness of the advantages and disadvantages of AI to enhance its use at all levels of education.

In light of accelerating developments, universities have increasingly adopted advanced methods to enhance and streamline the educational process, with e-learning playing a central role in modern education. Nonetheless, with the ongoing introduction of e-learning in universities, it is an urgent necessity to perfect this approach and make it more flexible to the traits of students and their learning styles. AI, as the most significant technology of this time, has been incorporated into other industries, including the education field, to enhance results and address the demands of students. Nonetheless, it is evident that the field of AI in e-learning within certain faculties of Al-Baha University still needs to be investigated. Moreover, it will be effective based on the incorporation of modern technologies such as AI, which will further improve the learning processes through adaptive systems, data analysis, and delivery of personalized content. This paper explores the preparedness of the academic department at Al-Baha University to use AI applications in e-learning by answering the following questions:

1. What is the current status of e-learning in selected Al-Baha University departments (Biology, Educational Technology, and Family and Community Medicine) from the perspective of employees in the Deanship of E-learning?
2. What are the capabilities of these departments in employing AI applications in e-learning?
3. What is the level of knowledge and readiness among teaching staff in these departments regarding AI concepts?
4. How prepared are teaching staff in these departments to use AI applications in e-learning?
5. What are the main obstacles hindering the implementation of AI applications in e-learning from the perspective of teaching staff?

3. Research Methodology

The research design is descriptive, which is appropriate for collecting data to determine the readiness of the chosen departments at Al-Baha University to utilize AI applications in e-learning. The descriptive method is most suitable for quantifying views and perceptions of a selected group of people regarding a given issue. It enables the gathering, analysis, and interpretation of data concerning the phenomenon under study and ultimately facilitates the formulation of generalized conclusions. The study was conducted in three units of Al-Baha University: the Faculty of Science, Educational Technology, and Family and Community Medicine. The target population comprised all faculty and staff of the Deanship of E-Learning in these departments. The research was carried out in the first semester of the 2024 academic year. Based on official statistics, the overall population included 108 faculty members and 79 staff members working in the respective Deanships. Purposive sampling was used to selectively collect data from two principal subgroups, considering their relevance to the research topic and the likelihood of providing informed responses: 95 faculty members and 53 staff members working in the Deanship of E-Learning. The main data collection tool was the structured questionnaire. Two versions of the questionnaire were created: The first focused on the employees of the deanship of E-Learning and was divided into two parts. Section A involved demographic information, such as

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gender, qualifications obtained, and years of experience. Section B contained nine closed-ended questions measured on a three-point Likert scale and divided into two domains. Domain 1 addressed the current state of e-learning implementation in the university (four items), and Domain 2 assessed the university's capability to incorporate artificial intelligence applications in e-learning (five items). The second questionnaire was administered to faculty members and was also split into two sections. Section A included demographic data, such as gender, department, academic rank, and years of experience. Section B comprised 19 Likert-scale closed-ended questions based on two domains. Domain 1 evaluated the scientific background of faculty members regarding AI and their willingness to adopt AI applications in e-learning (11 items). Domain 2 assessed perceived barriers and obstacles to adopting AI applications in e-learning (8 items).

4. Findings and Data Analysis

The data collected were analyzed using SPSS software and descriptive statistics, including frequencies, percentages, means, and standard deviations. Mean analyses were conducted to examine relationships between variables, and findings were interpreted to address the research questions.

Table 1.
The demographic characteristics of e-learning deanship staff members.

Demographic variables	Frequencies	Percentage
Gender		
Male	33	62%
Female	20	37%
Total	53	
Year of Experience		
Less than 5 years	13	24%
5 years up to 10 years	29	54%
10 years or more	11	20%
Total	53	

From Table 1 above, a total of 53 employees from the Deanship of E-Learning participated in the study. The majority of respondents were male (62%), and more than half of the participants (54%) reported having 5 to 10 years of professional experience.

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Table 2.
The demographic characteristics of teaching staff.

Demographic variables	Frequencies	Percentage
Gender		
Male	54	56%
Female	41	43%
Total:	95	
Department		
Biology	36	37%
Educational Technology	34	35%
Family and community medicine	25	26%
Qualification degree		
Lecturer	16	16%
Assistant professor	61	64%
Associate professor	13	13%
Professor	7	7%
Year of Experience		
Less than 5 years	9	9%
5 years up to 10 years	28	29%
10 years and more	58	61%
Total	95	

Based on Table 2, the demographic findings showed that the total number of teaching staff respondents was 95. Regarding gender distribution, male respondents slightly outnumbered female respondents (54 and 41, respectively). In terms of academic departments, the largest groups of respondents were from the Biology department (36), Educational Technology (34), and Family and Community Medicine (25). Concerning academic rank, most participants were Assistant Professors (61), followed by Lecturers (16), Associate Professors (13), and Professors (7). Based on years of experience, the majority of participants had 10 or more years (58), followed by those with 5 to 10 years (28), and only 9 participants had less than 5 years of experience. Overall, the sample is predominantly male and mainly consists of Assistant Professors, with a significant proportion of faculty members possessing extensive academic experience, which likely contributes valuable insights to the study. The study employed a three-point rating scale to interpret mean response scores. A mean from 1.00 to less than 1.67 indicated a low level, corresponding to the response category 'No' with a weight of 1.00. A mean from 1.67 to less than 2.34 signified a moderate level, aligned with the response 'Medium' with a weight of 1.67. A mean from 2.34 to 3.00 represented a high level, corresponding to the response 'Yes' with a weight of 3.00.

Table 3.
The current status of e-learning implementation at the university.

The statement	Mean	SD	P-value	Findings
There is still a demand for the use of e-learning within the university after the COVID-19 pandemic.	2.91	0.800	0.001>	High
The university continues to provide the necessary support for e-learning.	2.93	0.518	0.003	High
The university's IT infrastructure is continuously updated to meet the needs of e-learning.	2.70	0.854	0.001>	High
Faculty members are continuously trained to effectively implement the e-learning system.	2.39	0.635	0.001>	High
Total	2.73			High

From Table 3, all p-values are below 0.05, indicating that the results are statistically significant. The current status of e-learning at Al-Baha University showed the following findings: employees in the

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Deanship of E-Learning reported that e-learning is actively utilized within departments and is supported by consistent updates to technological infrastructure. However, continuous training for teaching staff was noted as an area requiring improvement. This indicates that participants' responses show meaningful differences and should be considered reliable. Additionally, there is a clear demand for continuing e-learning post-COVID-19 ($p < 0.001$, SD = 0.800), suggesting that most participants value its sustainability.

Table 4.
The university's ability to integrate artificial intelligence applications into e-learning.

The statement	Mean	SD	P-value	Findings
The university is prepared to use artificial intelligence applications within e-learning processes.	2.25	0.784	0.001>	Medium
The university is prepared to qualify and train faculty members to use artificial intelligence applications in e-learning.	2.40	0.804	0.001>	High
The university is prepared to develop a strategy for employing artificial intelligence applications in e-learning.	2.32	0.915	0.001>	Medium
The university is prepared to employ artificial intelligence applications while adhering to e-learning quality standards.	2.30	0.785	0.001>	Medium
The university is prepared to adapt its infrastructure to accommodate the use of artificial intelligence applications in e-learning.	2.32	0.792	0.001>	Medium
Total	2.32			Medium

Table 4 indicates that all p-values are less than 0.05, specifically <0.001, which suggests that the results are highly statistically significant. This provides consistent evidence that participants' responses are meaningful and not due to random variation. The departments demonstrated moderate readiness to integrate AI applications into their e-learning systems. Specific areas highlighted include acknowledging the need for strategies to employ AI, a willingness to train staff on using AI tools, and the availability of infrastructure suitable for AI integration, although this area was rated as needing further enhancement. The highest variability is found in the statement regarding developing a strategy for employing AI in e-learning (SD = 0.915), indicating that perceptions about strategic readiness are more divided among respondents. The lowest variability appears in the statements on using AI in e-learning processes (SD = 0.784) and adhering to quality standards (SD = 0.785), implying stronger agreement and less dispersion of views.

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Table 5.
Faculty members' readiness in Al-Baha University to integrate artificial intelligence applications in e-learning.

The statement	Mean	SD	P-value	Findings
I am knowledgeable about some artificial intelligence applications in the field of e-learning.	2.32	0.913	0.001>	Medium
I am willing to attend training courses and workshops on the use of artificial intelligence applications in e-learning.	2.89	0.685	0.002	High
I am willing to raise students' awareness of the importance of artificial intelligence applications in e-learning.	2.90	0.674	0.002	High
I am willing to use and employ some artificial intelligence applications in e-learning	2.90	0.863	0.001>	High
I am willing to explore artificial intelligence applications and employ them in e-learning	2.80	0.682	0.003	High
I agree with the partial replacement of faculty members by artificial intelligence applications	2.15	0.675	0.003	Medium
I believe that the IT infrastructure is suitable for employing some artificial intelligence applications in e-learning	2.20	0.647	0.002	Medium
I trust artificial intelligence applications when integrated into the educational process.	2.55	0.878	0.001>	High
I agree that artificial intelligence applications can perform some of the functions of faculty members	2.40	0.864	0.001>	High
I agree that artificial intelligence applications can assist faculty members	2.89	0.657	0.002	High
I agree that an artificial intelligence application may evaluate students in a course	2.29	0.877	0.001>	Medium
Total	2.57			High

The results in Table 5 reveal that respondents demonstrated only a moderate level of knowledge about artificial intelligence applications in e-learning, indicating limited familiarity despite some awareness of the field. However, their willingness to engage with AI is notably high, as they expressed strong readiness to attend training courses, raise students' awareness, and explore and employ AI applications in their teaching practices. While the idea of partially replacing faculty members with AI received only moderate acceptance, there was a clear preference for AI to play a supportive role by assisting faculty and performing some limited functions. In terms of infrastructure, respondents perceived the current IT systems as only moderately suitable, yet they showed relatively high trust in AI when integrated into the educational process. Interestingly, while they were positive about AI assisting faculty, they were more cautious about allowing AI to evaluate students directly, reflecting some hesitation in delegating assessment tasks. Overall, with a total mean score of 2.57 (High), the findings highlight a generally positive attitude toward adopting artificial intelligence in e-learning, marked by enthusiasm for support and enhancement, but tempered by reservations about replacement and evaluation roles.

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Table 6.
Barriers to integrating artificial intelligence applications in e-learning.

The statement	Mean	SD	P-value	Findings
Lack of sufficient knowledge about artificial intelligence applications	2.60	0.028	0.018	High
Lack of administrative motivation to employ artificial intelligence applications.	2.63	0.698	0.001>	High
Fear of replacing teachers' roles with artificial intelligence applications.	2.40	0.500	0.004	High
Increased workload and costs for faculty members.	2.41	0.556	.0.035	High
Bias in some artificial intelligence applications, leading to inaccurate results	2.50	0.723	0.001>	High
Lack of training programs on the use of artificial intelligence applications	2.88	0.523	.0.017	High
High cost of implementing artificial intelligence applications in education	2.52	0.713	0.001>	High
Absence of a clear strategy for employing artificial intelligence applications	2.80	0.715	0.001>	High
Total	2.59			High

Based on Table 6, all the statements are statistically significant ($p < 0.05$). This indicates that the participants consistently perceive these issues as real and impactful, rather than arbitrary or insignificant. The lowest variability (SD = 0.028) is observed in the statement regarding the lack of sufficient knowledge about AI applications, suggesting that nearly all respondents agree that this is a primary challenge. Moderate variability is noted in concerns such as fear of replacing teachers' positions (SD = 0.500) and workload/costs (SD = 0.556), reflecting some diversity of opinion but a high overall level of agreement. Higher variability is seen in issues like administrative motivation (SD = 0.698), bias in the use of AI (SD = 0.723), high costs (SD = 0.713), and lack of a clear strategy (SD = 0.715). This suggests these are perceived as serious problems, but responses vary more, possibly due to personal experiences or differing levels of awareness. Challenges related to staff education include inadequate training in AI knowledge and skills, insufficient funds and resources for AI implementation, the absence of clear plans and guidelines for AI application in learning institutions, and resistance to change among faculty members due to limited understanding of the technology.

5. Discussion

The results of this research show that the general level of e-learning implementation at Al-Baha University is high (the average M = 2.73 out of 3), which can be compared to the general tendencies observed in other universities in Saudi Arabia [3]. In particular, the need to further utilize e-learning remains significant even after the COVID-19 pandemic (M = 2.91, SD = 0.800, $p < 0.001$). These findings are comparable to the results from Riyadh universities, where 94.9% of interviewees indicated that interest in e-learning persists even after the pandemic [22]. The findings highlight the fact that the concept of e-learning has now been perceived as a long-term educational approach and not a short-term solution to an emergency situation [23].

On the same note, the current research indicates that institutional support for e-learning at Al-Baha University is high (M = 2.93, SD = 0.518, p = 0.003). This is similar to the results of Al-Garni [22], who found that in the case of e-learning deanships, 97.4% of staff members said that their universities still offer the required support. Combined, these findings indicate that Saudi universities, such as Al-Baha University, are determined to see digital learning through by dedicating resources and institutional support.

The other significant aspect identified during this research is the ongoing process of developing IT infrastructure (M = 2.70, SD = 0.854, $p < 0.001$). This is supported by the findings of King Saud University when the pandemic occurred, and the widespread use of technical and infrastructural assistance was documented to support high-quality e-learning using tools such as Blackboard [24].

This reflects a uniformity among universities that emphasizes the importance of technological preparedness as a key enabler of successful e-learning.

Nevertheless, one of the differences is faculty training. The training of teaching personnel was rated as less valuable at Al-Baha University ($M = 2.39$, $SD = 0.635$, $p < 0.001$), which is one of the aspects that need additional consideration. Although infrastructure and institutional support could be compared to other universities, the outcomes indicate that faculty professional growth might not be growing at the same rate as [3] hints. This is unlike in Riyadh universities, where claims of high institutional satisfaction were reported, with training and awareness programs being identified as significant contributors to the successful adoption of e-learning. To conclude, Al-Baha University has the same strengths as other Saudi institutions regarding e-learning demand, institutional support, and infrastructure. Nevertheless, it needs to close faculty training gaps to establish coherent and efficient provision of e-learning.

Regarding the aspect of AI use, the findings indicate that the degree of the university being generally prepared to implement the use of artificial intelligence (AI) applications in e-learning activities is moderate, which aligns with the findings of other Saudi universities [25]. This result reflects a larger national trend, as institutions understand the possibilities of AI in higher education but are not yet fully prepared. Its results align with those of Shelley [26], who proved that AI technologies like chatbots, robots, augmented reality, and virtual reality could substantially support the process of teaching and learning at the university level.

Faculty training was found in this study to be the most favorably rated element of AI preparedness, indicating that institutions recognize the primary role played by staff in the effective implementation of AI. However, infrastructure adaptation and strategic planning aspects were rated at moderate levels, which could limit the full application of AI in e-learning, aligning with the findings of Al-Zahrani and Alasmari [27]. As noted in the literature, the lack of coherent strategies and robust infrastructure may restrict the success of technological changes. Therefore, although initial signs of AI integration are evident, there is an urgent need to invest in infrastructural development and establish a formalized strategic framework to ensure sustainable and meaningful implementation.

The results also suggest that the willingness of the faculty members at Al-Baha University to use AI applications in e-learning is high. Faculty members demonstrated a high level of motivation to participate in training programs, learn about AI tools, and incorporate them into their classes. Additionally, they aimed to increase students' awareness of the significance of AI in education. The same outcome can be compared with the findings of Alenezi [28], who also indicates a favorable change in culture towards adopting AI as a valuable educational resource.

Meanwhile, the actual levels of knowledge and perspectives on infrastructure readiness were less radical, which implies that more institutional support is required. This result aligns with the findings of previous research by Awais et al. [6], indicating that infrastructure reinforcement and ongoing training opportunities are critical for providing efficient and sustainable AI integration. Overall, the results suggest a positive trend in faculty readiness, where motivation and openness are key facilitators of AI use in higher education.

Finally, the research results indicate that the faculty members emphasized various challenges that may become barriers to the successful implementation of AI applications in e-learning, which is aligned with the findings by Khan et al. [1]. The poverty of the level of knowledge, insufficiency of training opportunities, lack of a clear strategy by the institution, and the fear of the possible replacement of instructors by AI systems were the main issues observed. The second argument presented by faculty members was the monetary cost of implementing AI technologies and the potential bias in some AI applications that could lead to incorrect or unjust conclusions.

These problems can have a serious toll on the successful application of AI in education unless they are addressed at the institutional level and resources are distributed appropriately. Comparing the results with those of Al-Garni [22], a similar pattern can be observed. The faculty members present also reported that organizational, technical, and financial issues are the biggest barriers to AI

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implementation in e-learning. The fact that the two contexts have a correspondence highlights that these obstacles are not specific to a single institution but are indicative of more systemic and contextual issues in higher education. It is therefore important for universities to adopt a holistic approach that not only provides the necessary infrastructure but also empowers institutions through planning, faculty development, and stakeholder involvement.

6. Conclusion and Recommendations

In the analysis, it was determined that despite the growing willingness of universities to implement the use of artificial intelligence (AI) applications in the e-learning process, multiple barriers continue to impede their usage. Faculty members were quite open to working with AI in training, awareness, and practical application, and the barriers to its application include the lack of knowledge, training facilities, the high cost of implementation, as well as the absence of a strategic approach. These issues introduce a significant discrepancy between intention and the capacity to put it into practice within institutions of higher learning. The results demonstrate that institutional and personal preparedness to facilitate the effective application of AI in higher education should be developed. Until efforts are coordinated in terms of infrastructure, policy, and training, AI initiatives are at risk of remaining isolated and unsustainable.

Based on these conclusions, the research recommends that universities should create and implement a holistic, well-defined strategy for the implementation of AI in e-learning that aligns with national quality standards and university objectives. Faculty, students, administrators, and IT professionals are the stakeholders who must be engaged in strategic planning to ensure viability and alignment. Continuous training programs and workshops should also be provided to enhance the competence and confidence of faculty members so they can effectively utilize AI tools. Furthermore, investments in technological infrastructure and digital assistance should be sufficient to promote scalability, safety, and innovation in AI-based education. Universities are encouraged to motivate and support organizational efforts by establishing a culture that values innovation and addresses faculty concerns related to workload and job security. It is important to clarify that AI is a support tool and not a replacement for educators, which can help reduce resistance and fear. Ethical and technical concerns can be addressed through the development of policies focused on minimizing bias, ensuring data protection, and promoting the responsible use of AI. Finally, institutions should initiate awareness campaigns among students and faculty regarding AI literacy, responsible usage, and the potential benefits of AI. Additional support for the sustainable and effective implementation of AI in higher education can be achieved through partnerships with industry leaders, including technology providers and academic institutions.

Transparency:

The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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