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Exploring the Benefits and Challenges of Utilizing Artificial Intelligence in Education from the Perspective of Teaching Cadre at Bisha University

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Research Article

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Abstract

Background/purpose. This study explored the benefits and challenges of using artificial intelligence (AI) in education from the perspective of academic staff at Bisha University in Saudi Arabia.

AI is a practical field of science and technology that is changing all the fields of capacity development priority. In education, AI has begun generating new teaching and learning solutions that are currently undergoing testing in diverse contexts that require highly developed constructions and a context of teaching and learning.

Materials/methods. The researchers adopted a qualitative research method to achieve the objectives of the study. A questionnaire of 30 items and three dimensions was developed. The first dimension (10 items) focused on the benefits of employing AI technologies in tertiary education (Bisha University). The second dimension (10 items) was concentrated on the challenges of using AI technologies in tertiary education (Bisha University) as well. The third dimension (10 items) included solutions and recommendations to address the challenges encountered by faculty members when applying AI technologies at Bisha University.

Results. AI technologies were found to offer many academic benefits, particularly in terms of instructional advantages and learning benefits. It provides specialized instruction and skilled teaching for students predicated on respective requirements, concerns, and educational styles. It facilitates linear student assessment, assisting educators to monitor student performance assessment and determine their needs efficiently and adequately.

Conclusion. This study has implications in that it could be used by staff members at Bisha University and other Saudi universities to espouse AI technologies in education because of their observable gains and perceivable benefits. The results may help educational establishments and policymakers integrate AI technology tools into teaching and learning.

1. Introduction

Education has long been considered the foundation and groundwork of social development and societal progress and is deemed crucial in ushering the evolution of individuals and nations (Swanson, 2022; McLaren, 2015). In particular, tertiary education epitomises an evolutionary phase that enhances knowledge and nurtures global economic development, creativity, and competitiveness (Crow & Dabars, 2020; Mok, 2011). Universities are distinctively placed to qualify skilled, multi-talented professionals capable of enhancing an interrelated, rapidly developing world economy (Fatima, 2017; Rob et al., 2007). Institutions of higher learning foster vital skills, such as project-based learning, which facilitates the process of gaining lifelong skills and technological literacy to prepare individuals capable of fulfilling the demands of a knowledge-based world (Wurdinger, 2016; Guruz, 2011).

Over the last few decades, technological developments have had considerable influence on didactics. Incorporating electronic devices, such as computer software and hardware, the Internet, and multimedia data, has made education more captivating and dexterous, creating an accelerated learning environment that promotes synergetic and fascinating experiences (Mahmoud, 2019; DeVoss & Hicks, 2010). These technologies have boosted the traditional method of teaching and laid the groundwork for innovative methodologies that address the unique and varying needs of learners (Wilson et al.,2016)

Among the most innovative technologies revamping higher education is artificial intelligence (AI). AI technologies are modernising education by enabling individualised instruction experiences, enhancing administrative arrangements, managing mechanisms, and offering tangible takeaways for instructors (Hutson & Rains, 2024; Jacques et al.,2024). Tools such as virtual reality (VR) and augmented reality (AR) further improve the learning experience by providing virtual reality environments that help students understand subtle concepts more efficaciously (Zhao et al., 2024; Islam et al., 2025). These developments are associated with the increasing need for pliable and holistic education systems that are responsive to autonomous learner demands (Malik, 2018; Hopkins& McKeown, 2002).

AI technologies can be generally classified into three kinds: narrow, general, and super AI. Narrow AI is intended for particular tasks, such as automated grading and chatbot support, while general AI indicates broader cognitive abilities, allowing individual learning and decision-making (Garg, 2021; Albahiri et al., 2025). Despite still being experimental, super AI seeks to reproduce individual consciousness and emotional intelligence, encouraging groundbreaking results and innovative outcomes in education (Khalifa, 2018). These capacities highlight AI's capability to transform teaching and learning practices, making education more attainable, effective, and suited to autonomous learners (Chen et al., 2020).

However, despite its innovative capacity, incorporating AI into higher education remains an arduous task. Institutions often confront obstacles, such as insufficient infrastructure technology, a shortage of trained instructors, and opposition to innovative methods of instruction (Kuleto et al.,2021). Amin (2015) stated that traditional offline learning or face-to-face classes and assessment perceptions continue to prevail, making AI-driven solutions emerge as less reliable in some academic contexts and situations of education. Moreover, ethical aspects, such as data confidentiality and algorithmic bias, further complicate the integration of AI technologies (Heffernan & Heffernan, 2019).

Thus, higher education establishments must adopt a strategic concept to solve these problems. Among these concepts are offering broad-based training for higher education staff, investing in robust informational technology infrastructure, and promoting a culture of innovation that holds new teaching and learning methodologies. Johnson et al. (2021) and Al-Shahrani& Alhaj (2025) opined

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that the beneficial integration of AI requires a joint effort that includes instructors, computer scientists, and policymakers teaming up to optimise the potential of AI while reducing its challenges.

Research on AI in education accentuates the profound impact of these technologies. For example, Luckin et al. (2016) revealed that AI applications could promote technology-enhanced classrooms, enabling students to learn individually and providing instructors with insights to enhance educational strategies. Similarly, Al-Abadi (2021) delved into how VR and AR technologies boost educational engagement and student experience, closing the gap between theoretical understanding and pragmatic applications.

The feasibility of AI in tertiary education is associated with the goals of Saudi national development plans, such as the Saudi Vision 2030, which underscores the noteworthiness and significance of technological innovation in promoting education and economic development (Pedro et al.,2019). By utilising AI, universities can better prepare alumni to fulfil the requirements of a competitive international economy while tackling local and regional development demands. (Johnson et al.,2021)

Given these arguments, this study explores the merits, difficulties, and solutions aligned with incorporating AI technologies in tertiary education, concentrating on the experiences and viewpoints of the teaching faculty at Bisha University. This study seeks to contribute to the emerging body of research on AI in education by studying the implicit implications for AI adoption and providing practical implications for educators and decision-supporting insights for policymakers who aim to utilise AI's revolutionary capabilities and innovation proponents.

1.1. Research Problem

While incorporating AI technologies in education holds considerable innovative capacity, it is also replete with great difficulties. As higher education progressively moves towards virtual instruction and web-based learning platforms, the vast array of digitised data that teachers and educators must manage is also overwhelming (Rafiq et al.,2024). This digital change and decreased face-to-face communication between teachers and students have led to lower satisfaction rates and boosted dropout rates (Yildirim et al., 2021). These issues emphasise an imperative need for the quality, involvement, and pertinence of e-learning through intelligent technologies capable of filling these gaps.

AI is evolving as a revolutionary change in education, providing tools such as digital learning, machine learning in education, digital grading, innovative learning spaces, and collaborative learning environments to enhance teaching and educational attainment. For instance, digital learning can process huge amounts of data to provide applicable conclusions and decision-supporting insights for teachers, facilitating more analytical decision-making(Alawadhi, 2024). Intelligent tutoring systems acclimate to personal learner needs, offering individual assistance that boosts the effectiveness of learning and engagement (Luckin et al., 2016). Despite these advancements, great difficulties impede the proper implementation of AI in higher education. Faculty members often encounter barriers such as inadequate technical skills, inertia to change, scarce resources, and insufficient organisational support.

The United Nations Educational, Scientific, and Cultural Organisation (UNESCO) has highlighted the crucial role of AI in achieving sustainable growth goals (UNESCO, 2019). According to UNESCO, AI can improve human-machine cooperation, promote lifelong education, and boost equality of educational opportunities by adapting educational experiences to different population groups (Miao et al.,2021). Moreover, AI has also revealed the potential to improve education administration, support educator development, enhance knowledge evaluations, and integrate ethical education and

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morality education into the curriculum (Al-Yajzi, 2019). These capabilities are associated with the increasing emphasis on preparing students for the demands of a digital global economy.

Research on new technologies further maintains AI's innovative capacity in education (Hathnawi and Najm ,2019) emphasize the merit of incorporating new technologies in systems of higher education to increase efficiency, engagement, and results of learning and learning achievements. However, they advise that these efforts must be attended by initiatives to address institutional, cultural, and ethical barriers. These initiatives include building an information technology infrastructure, providing tailored training programs for faculty members, and boosting a culture that embraces technology innovation and the advancement of technology.

Regardless of its promise, the adoption of AI in higher education encounters objections from instructors and institutions. Studies suggest that the traditional learning model often conflicts with the pliant, evidence-based practices. For example, AI. (Johnson et al.,2021) has noted that long-established perceptions of offline learning and assessment limit the pertinence of AI-driven e-learning solutions. Ethical issues such as data confidentiality, algorithmic bias, and the potential dehumanisation of learning processes further complicate AI adoption (Heffernan & Heffernan, 2019).

In light of these challenges, extensive research that explores the gains and obstacles of incorporating AI into higher education must be conducted. Institutions can greatly support adopting AI technologies by understanding faculty members' perspectives and identifying practical actions. This study seeks to contribute to this discussion by investigating the perspective of academic staff at Bisha University on the benefits and challenges of using artificial intelligence (AI) in education. Precisely, the study seeks to address the following key aspects: (1) the benefits of AI integration in higher education, (2) the challenges academic staff at Bisha University encounter in utilising AI technologies, and (3) the solutions needed to overcome these challenges.

This study is associated with worldwide calls for innovation in education and contributes to developing understanding and increasing knowledge of AI's role in transforming higher education. The study aspires to inform institutional plans, enhance pedagogical techniques, and conclusively boost student learning outcomes in an expeditiously developing educational and learning environment by closing the gaps between theoretical possibility and practical implementation.

1.2. Research Objectives

The study aims to:

1. Extensively identify and analyse the substantial benefits of incorporating artificial intelligence (AI) technologies into higher education as viewed by Bisha University's faculty members.

2. Explore the critical obstacles and challenges that hinder the productive integration and successful implementation of AI technologies in higher education from the perspective of Bisha University's faculty members.

3. Suggest data-driven approaches and strategic proposals to overcome the obstacles encountered by faculty members, thereby facilitating the successful utilization of AI technologies at Bisha University

1.3. Research Questions

In conformity with the three-fold objectives of the study, the questions leading this research are:

1. What are the perspectives of Bisha University's faculty members on the purported benefits of integrating artificial intelligence (AI) technologies into higher education?

2. What are the perspectives of Bisha University's faculty members on challenges that impede the effective adoption and utilization of AI technologies in higher education?

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3. How can these challenges be handled from different theoretical and practical perspectives regarding data-driven approaches and strategic proposals?

1.4. Significance of the Research

This study is expected to make the following substantial contributions:

1. Progressing Saudi Vision 2030 Goals: By associating with Saudi Vision 2030's targets, the study highlights the paramount importance of the development of education, especially in higher education, while supporting the incorporation of Al technologies to boost the situation of the education and learning sector.

2. Empowering Faculty Members: The study provides useful information for the faculty of tertiary education, providing strategies to guide and overcome the challenges aligned with implementing and effectively using AI technologies in teaching and learning processes.

3. Informing Institutional Decision-Makers: The results of the study will serve as a resource for policymakers and administrators in organizations of higher education. Moreover, the findings will underscore the requirement of investing in innovative technologies and organizing broad-based training programs to empower faculty members to adopt Al effectively.

4. Enhancing Curriculum Design: The study provides advice for course authors, e-learning developers, and instructional content creators, highlighting the inclusion of AI as supplementary elements in didactic content and instructional material to enhance learning experiences, cultivate experimentation, promote ingenuity, and develop overall educational attainments.

2. Literature Review

2.1. Most Prominent Benefits of AI in Education

AI offers innovative capacity and revolutionary capability in education, especially higher education, by enabling innovative teaching and learning practices (Kuleto et al., 2021). The benefits of AI technologies are perceptible through their variety of applications, revamping traditional educational systems. Below are some of the most significant benefits and considerable gains of AI in education:

First, Intelligent Tutoring Systems (ITS): ITS represents a vital application of artificial intelligence in education, optimising advanced computational algorithms to deliver interactive, individual learning experiences (Alrakhawi et al., 2023; Luckin et al., 2016). These systems are created to mimic a human tutor's adaptive and cooperative attributes, enabling them to pander to the specific needs of autonomous learners. ITS can identify strengths, recognize areas for advancement, and offer specific interventions that enhance learning outcomes

ITS frameworks are based on four essential models, each serving a unique function to boost the learning process:

A. Domain Model: The domain model comprises the instructional content involving subject-specific knowledge, examples, and solutions. It is a baseline for evaluating learner progress and is the source of precise instructional material. This model ensures that the learning objectives are associated with the curriculum and the didactic goals of the course.

B. Teaching Model: The teaching model is accountable for instructional decision-making. It adapts strategies predicated on the learner's capabilities, setting the appropriate pace and determining the successive steps in the educational process. This model relies on educational

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concepts to create a constructed learning environment geared to individual needs (Nkambou et al., 2010).

2.1.3. Learner Model

The learner model continuously traces the student's new knowledge state, obtaining details such as levels of learning, progress, and patterns in learning behaviour. The data are also used to individualise the learning experience, provide feedback, and determine challenges that need attention.

2.1.4. Interface Model

The interface model is the strategic bridge between the learner and the ITS. It expedites integrated interactions, displaying content in an adaptive and interactable format. This model utilises user-friendly designs and multimedia tools to improve learner engagement, pandering to eclectic learning preferences (Abdelrahman, 2018).

Modern ITS systems have advanced greatly, integrating machine learning techniques to enhance flexibility and anticipation proficiency. For instance, they can recommend personalised learning paths and educational pathways, predict learner challenges, and offer live updates and context-sensitive feedback (Koedinger et al., 2013). Studies have revealed that machine learning can considerably develop student engagement, comprehension, and learning achievement when incorporated into sundry academic contexts.

Despite their potential, applying ITS in educational institutions encounters challenges, including high development potential, robust infrastructure technology, and educator training requirements. Addressing these challenges through collective research, comprehensive studies, and investment in AI-driven education tools will be necessary and basic to unlocking ITS's full potential in remodelling new education.

2.2. Components and Features of AI-Based Intelligent Learning Systems

Akami (2017) asserts that AI-based intelligent learning systems incorporate different components to offer adaptive and powerful learning experiences. These components encompass the following:

A. Program-Specific Knowledge: This component contains the field of study, academic level, and learning materials to be provided. It ensures alliance with instructional aims and gives the basis for teaching materials.

B. Learner-Specific Knowledge: Intelligent systems include detailed profiles of learners containing their educational level, educational needs, interests, and favoured learning styles. This personalization ensures the system adapts the academic experience:and learning experience to meet individual needs.

C. Educational Strategy Knowledge: The system optimizes several teaching strategies, evaluation methods, and techniques for supporting students. These strategies facilitate the system to be tailored powerfully to different learning scenarios and challenges.

2.3. Key Features of Intelligent Learning Systems

Intelligent learning systems supplied with AI technologies provide multiple features that substantially improve the academic experience:

A. Personalization: Intelligent learning systems are designed to create a special academic pathway for each student. By analysing individual requirements, interests, and learning styles, these systems personalise content and pedagogic methods to optimise engagement and understanding.

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B. Interactivity: These systems enhance engagement and foster deeper learning by boosting active interaction between students and educational content. Characteristics like computer-enhanced simulation, dynamic real-time, simulation-based tests, and educational gaming experiences make education more attractive and efficacious.

C. Continuous Assessment: Intelligent systems offer real-time evaluations of student performance, enabling educators to watch progress and identify learning gaps. Sustained feedback helps ensure that learning objectives are met successfully, allowing for swift interventions as the need arises.

D. Timely Support: These systems can deliver tailored help and customized assistance predicated on students' real-time feedback loop. For example, they can provide clues, extra resources, or remedial exercises geared to personal needs and improve the learning process.

2.4. Advancing Learning with AI-Based Systems

Integrating these components and features places AI-based intelligent learning systems as breakthrough tools in education. By fusing personalisation, interactivity, and adaptive support, these systems have the potential to transform traditional teaching, guaranteeing that learners receive a top-quality and engaging learning experience and an extensive experience. However, infrastructure needs, educator training, and considerable costs must be addressed to be keenly aware of their potential.

2.5. Applications of AI in Education

Artificial intelligence (AI) has appeared as a transformative application in education. It boosts learning experiences, enhances outcomes, and paves the way for innovation. (George & Wooden, 2023). AI-powered systems are implemented across various academic contexts to address diverse educational needs and enhance teaching practices.

2.5.1. E-Learning

AI enables the creation of individualised e-learning environments by analysing individual learner profiles and adapting content to their particular requirements, interests, and capabilities. This approach elevates student engagement and ensures more effective educational attainment.

2.5.2. Distance Learning

AI-driven systems offer crucial support and urgent reinforcement for e-learning, enabling students who cannot attend conventional classrooms to access quality education. (Kumar et al.,2021). These systems give flexible content, continuous evaluations, and on-the-spot feedback, live reinforcement, closing loopholes between online learners and educators.

2.5.3. Blended Learning

Blended learning incorporates traditional and online teaching methods, enabling instructors to integrate AI technologies into traditional classroom contexts. (Shi et al., 2023). This combination permits superior flexibility and the utilization of innovative methods to enhance learning experiences.

2.6. Optimizing AI in Education

A study conducted by Al-Abadi (2021) underscored that the proper implementation of AI technologies in higher education demands that institutions improve robust expertise, invest in cutting-edge infrastructure, and adopt proper tools and strategies. Essential areas highlighted for improving AI's potential encompass:

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A. **Developing Smart Content:** AI facilitates the creation of adaptive e-textbooks and collaborative learning interfaces designed for university-level education. These tools allow learners to engage with material intended for their academic needs and preferences.

B. **Building Intelligent Learning Systems:** AI-powered frameworks integrate knowledge from academic fields, learning areas, learner profiling, and educational strategies to deliver flexible and customised learning experiences.

C. **Enhancing Interactive Learning:** Optic devices of learning material, incorporating supposition, and changing fixed content into interactive virtual pages stimulate diligent learners' participation and critical thinking.

D. **Facilitating Knowledge Acquisition:** AI systems promote the retention, updating, and occupancy of knowledge to solve real-world educational issues and instructional concerns. These abilities help learners associate academic concepts with real-world applications.

E. **Bridging Theory and Practice:** AI associates theoretical knowledge instruction with experiential education, enabling students to gain a greater understanding of notions and put them into practice in a naturalistic context and effective milieu.

F. **Enhancing Educational Practices with AI:** Incorporating AI into education enhances the learning process and supports instructors in their roles by robotising routine work, providing insights into academic attainment, and offering innovative teaching tools. However, achieving these outcomes needs addressing the construction of infrastructure, educator training, and associating AI applications with institutional goals.

2.7. Second: Adaptive Learning Environments

Adaptive learning environments employ complex AI algorithms to adapt educational experiences to the particular needs of autonomous learners. These systems analyse a student's responses to questions and powerfully adapt the content presentation, providing personalised resources and targeted educational activities. By associating didactic material with the cognitive requirements and psychological demands of each learner, these environments nurture greater engagement and outstanding achievement (Darling-Hammond et al.,2020). Furthermore, adaptive systems provide on-the-spot feedback, empowering students to improve at their own pace while reducing the need for direct instructor intervention. Studies have revealed the effectiveness of adaptive learning environments in customising instruction and creating holistic learning experiences.

2.7.1. Educational Robots

Educational robots represent an innovative AI application that simulates human-like communication to support learning. These robots use advanced conversational capabilities to engage students through text-based or voice-enabled communication. Running autonomously and without human intervention, they utilise pre-programmed databases and integrated knowledge repositories to respond to learner queries with accuracy and relevance. (Huq et al.,2024; Albahiri & Alhaj, 2024).Educational robots are implemented across multiple platforms, comprising messaging apps, web-based tools, mobile applications, and telephonic systems, to ensure accessibility. They provide learners with instant and quick support, offering exact answers, guidance, feedback, and extensive responses, substantially boosting the learning experience. Freyer (2019) highlights their potential to transform education by providing steady and authentic support and assistance, nurturing student self-determination and trust in steering complicated subjects and challenging themes.

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2.7.2. Expert Systems

Expert systems are innovative AI-driven applications designed to emulate the decision-making capabilities of human specialists. These systems are built upon three essential components:

A. User Interface: This interface facilitates integrated interactions between users and the system, enabling queries and providing expert-level insights.

B. Knowledge Base: Places a most comprehensive collection of domain-specific information, facts, and logical rules from human experts.

C. Inference Engine: Applies logical inference to analyze the body of knowledge and generate clear-cut solutions to user problems .

By incorporating expert systems into higher education, organisations and establishments can empower students and educators to remove any impediments and handle matters with accuracy and ingenuity. These systems enable the storage and dissemination of expertise across diverse regional and systemic environments and institutional backgrounds, ensuring that knowledge is available and convenient to all. (Liu et al.,2023;Doli & Naseri, 2018;Alhaj, ,2024).Moreover, artificial intelligence boosts capability, reduces human error, and nurtures unbiased decision-making, advancing fairness in academic and administrative processes. Amin (2015) highlights the crucial role of artificial intelligence, which involves innovative problem-solving strategies and supports institutional excellence in education.

2.8. Integrating AI with Virtual Reality

Virtual reality (VR) is a smart simulation technology replicating naturalistic context, offering artificial realities by engaging numerous senses. When strongly associated with AI, VR tools provide learners with innovative methods to explore real landmarks, visualise intricate scientific phenomena, and comprehend abstract ideas. (Kamińska et al.,2019). These applications make learning more engaging, interactive, and practical by combining simulations with instantaneous feedback mechanisms, causing enriched educational attainment. AI-powered VR tools are categorized into three primary systems:

A. Content Management Systems (CMS): Platforms that effectively form and deliver learning resources.

B. Learning Management Systems (LMS): Tools that monitor and manage students' achievement through various phases of their learning process.

C. Educational Content Management Systems (ECMS): Systems designed specifically for creating and disseminating customised didactic materials to meet diverse educational requirements and learning needs

Applications of AI-driven VR technologies in education encompass classroom simulations, enhanced homework aids, live visual scenarios, and specialised learning resources such as instructional cards or flashcards for students with disabilities. These tools boost the educational experience by creating multisensory, engaging platforms and interactive environments that promote increased interaction and comprehension.

2.9. Challenges of Artificial Intelligence in Education

Despite AI's groundbreaking potential and revolutionary capability in education, its implementation poses consequential difficulties that range from technological to institutional, cultural, and ethical aspects. Tackling these challenges is pivotal for effectively using and efficiently utilising AI technologies in educational settings. Alajlan (2022) highlights several underlying challenges aligned with incorporating AI into education:

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A. High Costs: Implementing AI technologies involves considerable financial investments in software, hardware, digital infrastructure, and incessant maintenance. For many establishments, these costs represent a substantial obstacle to adoption.

B. Behavioural Impacts: Excessive dependence and overreliance on AI may negatively impact human social and cognitive skills, such as critical thinking, interpersonal interactions, and societal interactions, as technology substitutes particular tasks and prescribed responsibilities.

C. Cybersecurity Risks: AI systems, comprising educational robots and learning platforms, are exposed to *such cyber attacks* as hacking and self-replicating malware, which can present a hazard to data security.

D. Skill Gaps in Technical Proficiency: Many instructors, administration staff, and administrative employees lack the training and skills to utilize AI systems in teaching and management efficiently.

E. Potential for Job Displacement: The automation of specific educational roles through AI could give rise to problems about joblessness among educators and administrative personnel.

F. Cultural Resistance: Resistance to technological change within educational institutions often hinders the integration of AI. Many educators and decision-makers remain hesitant because of skepticism about its efficiency and productiveness.

G. Insufficient Leadership Support: Limited commitment from educational management leaders often results from insufficient knowledge about AI's potential gains and earning potential, further impeding and obstructing its adoption.

H. Infrastructure Weaknesses: Poor digital infrastructure and unreliable internet connectivity weaken the implementation of AI-driven systems, especially in underserved regions or less-developed areas.

İ. Algorithmic Inflexibility: Many AI systems lack the adaptability to function efficiently and successfully in vigorous and diverse instructional contexts and academic landscapes.

J. Awareness Deficits: A poor knowledge and inadequate understanding of AI's potential and educational applications among educators and administrators impedes its incorporation into teaching and learning processes.

K. Shortage of Experts: The dearth of AI specialists and limited training opportunities for educators and staff further exacerbate difficulties and obstacles akin to implementation.

2.10. Ethical and Cultural Considerations

Mukherjee (2020) draws attention to the merit of ensuring that AI applications in education perfectly complement rather than substitute human educators. The dismissal of faculty roles in favor of AI systems risks reducing the quality and depth of education. Wang (2020) further found that, unlike traditional technologies, AI often disturbs traditional pedagogical techniques and methods of teaching, obtaining resistance from both instructors and students. Successful AI adoption needs to address these cultural and ethical problems to promote acceptance and integration within educational institutions.

2.11. Challenges Specific to Higher Education

Incorporating artificial intelligence (AI) into higher education presents unique obstacles that require conscious attention and innovative methods. These challenges are multifarious and range in cultural, technical, and ethical aspects.

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2.11.1. Conservative Educational Practices

Higher education institutions often show resistance to adopting innovative technologies. This reluctance comes from risk tolerance, conformity to traditional teaching methodologies, and limited innovation resources. Educators and decision-makers may demand robust evidence of AI's capacity to enhance educational attainment before considering its adoption.

2.11.2. Competency Development

Powerful AI integration is heavily reliant on advancing technical and pedagogical competencies among faculty and administrative staff, requiring considerable investment in career development and skill enhancement activities to enhance capacity for efficiently and successfully implementing AI tools.

2.11.3. Stakeholder Misunderstanding

Many students and parents may not fully grasp AI's role and potential in education. Inaccurate assumptions about AI can create reluctance or skepticism, drawing attention to the need for targeted awareness campaigns to effectively convey its gains and losses.

2.11.4. Ethical Considerations

Adopting AI in higher education raises critical ethical issues, such as data privacy, algorithmic transparency, and ensuring educators sustain control over decisions supported by AI tools. It is our collective accountabilities and joint duties to address these issues, as doing so is vital for the promotion of confidence-building and fairness in AI-driven academic landscapes.

2.12. Barriers to Faculty Adoption of AI in Higher Education

Many studies, including Sabriyah (2020), have determined barriers impeding educators from enclosing AI technologies in higher education. These challenges often emanate from a combination of personal, institutional, and financial factors:

1. Limited Awareness: Despite the challenges, the potential benefits of AI in education are great and fascinating. However, a dearth of awareness of AI technologies and their instructional applications often hinders educators from perceiving these potential gains and possible positive effects.

2. Insufficient Training: The lack of structured training programs reduces opportunities for faculty to gain the skills and develop the knowledge needed to utilize AI efficiently.

3. Time Constraints: Teaching cadres often encounter competing challenges for teaching, research, and administration tasks leaving little time to learn and implement AI technologies.

4. Resistance to Change: Many educators prefer traditional teaching methods and resist adopting new next-generation technologies,

5. Institutional Support: The dearth of guidance and support from university leadership and concerned authorities is a pressing problem that often increases challenges in AI adoption. Thus, establishments must offer vital support to tackle these hindrances and problems.

6. Financial Barriers: The large costs and substantial expenses of obtaining and sustaining AI tools, software, and infrastructure present serious obstacles and substantial barriers, particularly for establishments with a very tight budget and financially challenging situations.

7. Effort Perception: Some faculty members consider the adoption of AI as requiring considerably more effort than conventional methods, deterring them from exploring its capability.

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8. Student Engagement: Resistance from students unknown to AI-driven educational atmospheres and educational spaces can undermine the efficiency and productiveness of these technologies.

2.13. Ethical and Practical Considerations

Implementing AI in education requires more than just a checklist of ethical and practical matters. It requires a reliable framework and sturdy structure that can efficiently tackle these issues, ensuring fair and successful outcomes.

- Data Privacy: Ensuring the privacy and security of creative students and faculty information is supreme in any AI application.
- Algorithmic Fairness: AI systems must be designed to avoid bias and ensure fair access and opportunities for all learners.
- Human Oversight: While AI can improve decision-making, educators and administrators must maintain absolute control over crucial decisions to protect the confidentiality of educational processes.

To conclude, by highlighting and arranging these ethical aspects and equity grounds, universities can create an equitable environment and stable surroundings where AI technologies are not seen as a threat but as tools that enrich and enhance the crucial values and principles of education.

2.14. Previous Studies

This study is among the first to examine the implementation of AI in education from the perspective of academic staff at one of Saudi universities(Bisha University). Many studies have investigated the problems and advantages of artificial intelligence and expert systems in higher education establishments. For example, Kuleto et al. (2021) found that AI and machine learning (ML) are pivotal technologies that boost learning, mainly through students' skills, cooperative learning in higher education establishments, and an accessible research landscape. Popenici and Kerr (2017) showed that with the emergence of AI solutions, educational establishments to remain vigilant and see if tech lords do not monopolize the power of control over hidden algorithms that run them. Tzirides et al. (2024) found that the participants appeared to feel more comfortable using GenAI tools after their course experiences. The authors also indicated that the students' advanced ability to understand and critically evaluate the beneficial effects of AI applications in education. Rizvi (2023) showed that effective implementation demands in-depth consideration of ethical implications and beneficial integration into today's educational institutions for more effective results and perfect implications. Abou Karroum et al. (2024) reported a strong correlation between participants' understanding of AI-related risks in education and their perceptions of AI's influence on the college education system, highlighting the intricate relationship between awareness and attitudes towards AI in education. The negative side taken from the research is related to generalizability. Egara and Mosimege (2024) highlighted the merit of continuous professional training and perpetual support for educators to incorporate AI-based ChatGPT into teaching and learning.

Vera(2023) indicated that the participants have upbeat perspectives toward the use of AI, perceiving its potential to enhance learning and teaching. The findings of the study also highlighted the pertinence of considering students' stimulation levels and educators' pedagogical and technological expertise when incorporating AI into the EFL classroom. Fahimirad & Kotamjani (2018) revealed the next trend of utilizing AI technologies to enhance and better educational practices by using detailed analysis and bringing to light the multidimensional potential of AI to remodel teaching and learning patterns, setting a cornerstone for following queries into this dynamic junction. Darwin

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et al. (2024) uncovered that AI can be a benefit in the development of critical thinking skills, but with cautions that need careful administration.

3. Methodology

3.1. Research Methodology

The study employed the descriptive survey method to examine the benefits and challenges of utilizing AI in education from the perspectives of teaching cadres at Bisha University. This approach is adequate for the research's purposes because it painstakingly describes the phenomenon under examination. According to Al-Khalifa (2017), the investigation method includes questioning all members of the research population or a large sample to describe the studied phenomenon concerning its nature and extent without delving into cause-and-effect relationships or correlations.

3.1.1. Population and Sample

The research population comprised 65 faculty members at Bisha University. A randomized procedure was applied, leading to a sample of 30 faculty members selected from the larger population.

3.1.2. Research Instrument

A questionnaire focusing on the benefits and challenges of using AI in education at Bisha University was used to collect data related to the research topic.

3.1.2.1 Development of the Research Instrument

The questionnaire was developed predicated on a review of related literature and previous studies associated with the investigation purposes. It included two main parts:

1. Part One: Demographic information of the study sample.
2. Part Two: Thematic focus areas of the questionnaire, organized into three main axes:

    Pivot 1: Benefits of applying AI technologies in higher education at Bisha University (10 items).

    Pivot 2: Challenges impeding the utilization of AI technologies in education at Bisha University (10 items).

    Pivot 3: Solutions and suggestions to overcome difficulties in the implementation of AI technologies at Bisha University (10 items).

3.1.2.2. Instrument Validity

3.1.2.3. Content Validity

After building the questionnaire, it was presented to a panel of experts and faculty members majoring in education and AI. Experts were asked to evaluate the items' clarity, applicability, and suitability to their section. Amendments and suggestions from the panel were included. Items that received agreement from more than 85% of the experts were maintained.

3.1.2.4. Internal Construct Validity

The correlation coefficient between each item and the total score of the section to which it belonged was calculated to ensure the instrument's internal construct validity. This process verified the coordination of each item with its respective section, validating the instrument's internal consistency. The results revealed strong correlations, demonstrating a reliable internal structure.

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3.1.2.5. Reliability of the Instrument

The reliability of the questionnaire will be determined using statistical methods, such as Cronbach's Alpha, to ensure consistency in responses across the study sample. Reliability results will be presented in subsequent sections of the research.

3.1.2.6. Instrument Validity and Reliability

3.1.2.7. Construct Validity

Table 1 presents the correlation coefficients between each questionnaire item and the total score of the section to which it belongs. The results demonstrate that all correlation coefficients are positive and statistically significant and range from moderate to high values.

Table 1. Correlation Coefficients Between Questionnaire Items andTtheir Corresponding Axes

Correlation Coefficient	Item Number	Correlation Coefficient	Item Number	Correlation Coefficient	Item Number
.722**	21	.821**	11	.608**	1
.753**	22	.866**	12	.557**	2
.618**	23	.745**	13	.613**	3
.711**	24	.714**	14	.753*	4
.695**	25	.830**	15	.711**	5
.745**	26	.616**	16	.787**	6
.809**	27	.508**	17	.676**	7
.688**	28	.541**	18	.579**	8
.721**	29	.729**	19	.737**	9
.777**	30	.771**	20	.711**	10

Significance Levels
.(**) Significant at 0.01 level
.(*) Significant at 0.05 level

The results in Table 1 demonstrate that all items exhibited strong alignment with their respective axes because the correlation coefficients are statistically significant., thereby confirming the high Validity of the questionnaire items supporting their appropriateness for field application.

3.1.2.8. Instrument Reliability

Reliability refers to an instrument's consistency in producing similar results when administered multiple times to the same Sample or similar groups under comparable conditions. Cronbach's Alpha (α) was used to assess the questionnaire's reliability.

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Table 2. Cronbach's Alpha Coefficients for the Questionnaire Pivots

Pivotal axes	Number of Items	Cronbach's Alpha Coefficient
Benefits of AI applications in higher education at Bisha University	10	0.809
Challenges hindering AI applications in higher education at Bisha University	10	0.821
Solutions to overcome challenges in AI applications at Bisha University	10	0.786
Overall Reliability	30	0.842

The results in Table 2 indicate that the Cronbach's Alpha coefficients for all pivots and the overall reliability score of 0.842 are within the acceptable range for scientific research. These values confirm the questionnaire is highly reliable and suitable for achieving the study's objectives and answering its research questions.

3.2. Data Analysis Methods

Various statistical methods were employed through Statistical Package for the Social Sciences (SPSS) to achieve the study objectives and analyze the collected data. After coding and entering the data into the computer, the following criteria were used to interpret the results:

Table 3. Likert Scale Rating

Relative Weight	Range		Level
	from	to	
1	1.00	1.80	Very Weak
2	1.81	2.60	Weak
3	2.61	3.40	Moderate
4	3.41	4.20	High
5	4.21	5.00	Very High

The data collected through the questionnaire was analyzed employing proper statistical methods to find out the tendency of the study population's responses to the research questions. The steps for analyzing included the following.

3.2.1. Percentages and Frequencies

Percentages and frequencies were calculated to determine the demographic and operational characteristics of the study sample.

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3.2.2. Mean

The arithmetic mean was calculated to identify the level of agreement or disagreement of the study sample's responses to the pivotal axes and items of the questionnaire.

3.2.3. Standard Deviation

Standard deviation was used to measure the variability in the study sample's responses for each item and section. The closer the standard deviation is to zero, the more concentrated and less dispersed the responses are.

3.2.4. Pearson Correlation Coefficient

Pearson's correlation coefficient was used to measure the internal consistency between the questionnaire items and the total score of each section, thereby ensuring that the items associate well with their related dimensions.

3.2.5. Cronbach's Alpha Coefficient

Cronbach's Alpha was utilized to assess the questionnaire's reliability, ensuring that the instrument produces consistent results when applied to similar samples under comparable conditions.

4. Results and Discussions

4.1. Results for Research Question 1

What are the benefits of applying artificial intelligence (AI) technologies in higher education at Bisha University from the perspective of faculty members?

The means and standard deviations for the items under the first section were calculated to determine the benefits of AI applications in higher education. The results are presented in Table 6.

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Table 6. Means, Standard Deviations, Rankings, and Agreement Levels for the First Section

Agreement Level	Rank	Standard Deviation	Mean	Statement	Item No
Strongly Agree	3	.858	4.43	AI helps lecturers by freeing them from administrative tasks, which often consume a significant portion of their time.	1
Strongly Agree	1	.466	4.70	AI in education is characterized by personalization, offering a tailored learning experience for each student based on their needs, interests, and learning style.	2
Strongly Agree	7	.907	4.27	AI provides opportunities for interaction between students and educational content, enhancing student motivation and learning outcomes.	3
Strongly Agree	2	.572	4.50	AI enables lecturers to continuously assess students, helping educators monitor student progress and identify their needs.	4
Strongly Agree	4	.858	4.43	AI gives lecturers optimal time usage during lectures compared to traditional teaching methods.	5
Agree	8	1.062	4.10	AI supports individualized learning by focusing on the student, engaging them in learning, and improving their performance.	6
Strongly Agree	6	.850	4.37	AI enables lecturers to analyze student data on e-learning platforms to assess their performance and provide targeted improvements.	7
Agree	9	.885	4.10	AI in education accommodates individual differences among students.	8
Strongly Agree	5	.504	4.43	AI enhances cognitive skills in both lecturers and students.	9
Agree	10	.845	4.10	AI helps lecturers quickly identify student errors and provide the necessary guidance to address them.	10
Strongly Agree		0.78	4.34	overall mean score	

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4.1.1. General Observations

The results demonstrate that the overall mean score for this section was 4.34, with a standard deviation of 0.78, reflecting a "Strongly Agree" level of agreement. The low standard deviation shows a high level of consistency among the study sample's responses.

The standard deviations for the items ranged from 0.466 to 1.062, with all values being comparatively low, except for item 6, which had a higher standard deviation (1.062). These results reveal some variability in responses regarding the individualized learning benefits of AI.

4.1.2. Key Findings

4.1.2.1. Highest Rated Benefit

The highest-rated item was item 2, "AI in education is marked by personalization, offering an adaptive learning experience for each student predicated on their needs, interests, and learning style," with a mean of 4.70 and a standard deviation of 0.466. This finding highlights the perceived value of AI in providing adaptive learning experiences.

4.1.2.2. Second Highest-Rated Benefit

Item 4, "AI enables lecturers to continuously assess students, helping educators monitor student progress and identify their needs," was ranked second, with a mean of 4.50 and a standard deviation of 0.572. This result underscores the role of AI in supporting formative assessments and enhancing teaching effectiveness.

4.1.2.3. Lowest Rated Benefit

The lowest-rated item was item 10, "AI helps lecturers easily identify student errors and provide the essential direction to address them," with a mean of 4.10 and a standard deviation of 0.845. While still rated positively, this result suggests that respondents see this benefit as less impactful than others.

The results associated with prior investigations were on the benefits of AI in education, particularly in personalization, continuous assessment, and administrative efficiency (Luckin et al., 2016). The high personalization and formative assessment ratings reflect the growing demand for adaptive learning experiences and immediate feedback in higher education. These benefits are crucial for nurturing student engagement and enhancing academic outcomes. However, the lower scores for individualized learning and error detection suggest areas where faculty members may require further training or support to leverage AI technologies fully.

The findings demonstrate that faculty members at Bisha University perceive AI as very advantageous for boosting educational efficiency, personalization, and ongoing assessments. These results provide a strong foundation for further exploring the integration of AI technologies in higher education to maximize their potential gains.

4.2. Results for Research Question 2

What are the challenges hindering the use of AI technologies in higher education at Bisha University from the perspective of faculty members?

To identify the challenges strongly associated with AI technologies in higher education, the means and standard deviations for the items in the second section were calculated, as shown in Table 7.

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Table 7. Means, Standard Deviations, Rankings, and Agreement Levels for the Second Section.

Agreement Level	Rank	Standard Deviation	Mean	Statement	Item No
Strongly Agree	1	.507	4.47	Lack of specialists and experts in AI technologies.	1
Agree	5	.928	3.97	High costs associated with implementing AI applications in education.	2
Agree	9	1.179	3.70	Negative impact on human behavior due to limited interaction with machines.	3
Agree	6	1.112	3.93	Potential vulnerability to viruses and cyber-attacks targeting AI systems.	4
Agree	7	1.029	3.90	The difficulty some faculty members have in dealing with AI technologies.	5
Agree	8	1.137	3.87	Increased unemployment among teaching staff as a result of AI adoption.	6
Agree	4	.860	4.13	Difficulty in changing societal perceptions about adopting AI in education.	7
Strongly Agree	2	.877	4.30	Weak infrastructure to support AI applications in education.	8
Strongly Agree	3	.679	4.23	AI use in education reduces the interpersonal interaction between educators and learners	9
Strongly Agree	2	.877	4.30	AI may lead to a one-size-fits-all approach in education, potentially stifling creativity and innovation.	10
Agree		0.92	4.08	overall mean score	

4.2.1. General Observations

The overall mean score for this section was 4.08, with a standard deviation of 0.92, reflecting a high level of agreement ("Agree"). The low standard deviation suggests consistency among respondents' perspectives on the challenges of AI integration in higher education.

The standard deviations for solo items ranged from 0.507 to 1.179, with most values being comparatively low, signaling consistent responses across the Sample. However, items 3, 4, 5, and 6 had higher standard deviations, reflecting more significant variability in responses for these items.

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4.2.2. Key Findings

4.2.2.1. Highest Rated Challenge

The top-ranked challenge was item 1, “Lack of specialists and experts in AI technologies,” with a mean of 4.47 and a standard deviation of 0.507. This result underscores the imperative need for AI expertise within the university context.

4.2.2.2. Second-Highest Challenges

Items 8 (“Weak infrastructure to support AI applications in education”) and 10 (“AI may lead to a one-size-fits-all approach in education, potentially stifling creativity and innovation”) were tied in second place, both with a mean of 4.30 and a standard deviation of 0.877. These findings emphasize the importance of enhancing infrastructure and minimizing the risks of homogenized education models.

4.2.2.3. Lowest Rated Challenge

The lowest-ranked challenge was item 3, “Negative impact on human behavior due to limited interaction with machines,” with a mean of 3.70 and a standard deviation of 1.179. While this challenge was acknowledged, it was perceived as less significant than others.

4.2.3. Discussion

The results are associated with global problems in AI implementation in higher education. The lack of AI expertise and adequate facilities are widely recognized as serious obstacles (Luckin et al., 2016; Al-Shahrani and Alhaj, 2025). Similarly, concerns as to the likely loss of personal communication and creativity accentuate the need for judicious implementation strategies that balance technological efficiency with human-centered education.

Variability in responses to items related to the collective viewpoint and faculty flexibility suggests differing levels of readiness and acceptance among faculty members. This finding underscores the need for goal-driven training and awareness-raising programs to enhance capacity and promote positive attitudes toward AI adoption.

4.3. Results for Research Question 3

What solutions and proposals are necessary to address faculty members' challenges in implementing AI technologies at Bisha University?

The means and standard deviations for the items in the third section, as shown in Table 8, were calculated to identify the solutions and proposals necessary to overcome the challenges of AI implementation.

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Table 8. Means, Standard Deviations, Rankings, and Agreement Levels for the Third Section

Agreement Level	Rank	Standard Deviation	Mean	Statement	Item No
Strongly Agree	1	0.479	4.67	Promoting a culture of AI adoption within the university.	1
Agree	6	0.791	4.17	Supporting university-wide AI implementation initiatives	2
Strongly Agree	3	0.702	4.30	Including AI application goals in the university's strategic plan.	3
Agree	8	0.980	4.07	Providing an operational guide for processes related to AI applications.	4
Strongly Agree	4	0.944	4.27	Establishing cybersecurity policies to .safeguard AI applications	5
Agree	10	1.126	3.80	Developing the necessary infrastructure and communication networks to support AI in education	6
Agree	7	1.094	4.10	Allocating adequate budgets to support .AI applications	7
Strongly Agree	2	0.844	4.33	Recruiting AI specialists and experts to the university	8
Agree	5	0.887	4.20	Training faculty members on AI applications in education	9
Agree	9	1.098	4.03	. Establishing partnerships between the university, local communities, and specialized entities to support AI implementation	10
				overall mean score	

4.3.1. General Observations

The overall mean score for this section was 4.19, with a standard deviation of 0.89, reflecting a high level of agreement ("Agree"). The low standard deviation indicates consistency among participants' views on the proposed solutions, with some variability noted in items 6, 7, and 10 due to higher standard deviations.

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4.3.2. Key Findings

4.3.2.1. Highest Rated Solution

The top-rated solution was item 1, "Promoting a culture of AI adoption within the university," with a mean of 4.67 and a standard deviation of 0.479. This highlights the importance of fostering awareness and acceptance of AI among faculty and staff.

4.3.2.2. Second-Highest Solution

Item 8, "Recruiting AI specialists and experts to the university," was ranked second, with a mean of 4.33 and a standard deviation of 0.844. This indicates the need for expertise to support AI integration.

4.3.2.3. Lowest Rated Solution

The lowest-ranked solution was item 6, "Developing the necessary infrastructure and communication networks to support AI in education," with a mean of 3.80 and a standard deviation of 1.126. While this solution was rated positively, the relatively high standard deviation suggests differing opinions on its urgency or feasibility.

4.3.3. Discussion

The findings highlight several key strategies for overcoming challenges in AI implementation. Promoting a supportive culture and recruiting AI experts were the most strongly endorsed solutions, reflecting the critical role of human resources and organizational mindset in adopting new technologies. This aligns with existing research emphasizing the importance of human factors in successful AI integration.

Lower scores for infrastructure development may indicate that faculty members perceive this issue as a longer-term or systemic challenge requiring institutional and governmental support for resolution. Additionally, the variability in responses to budget allocation and community partnerships suggests differing familiarity or agreement regarding these strategies.

5. Conclusion

The discussions and interpretations of the study's findings highlight the significant benefits, challenges, and proposed solutions for integrating AI technologies into higher education at Bisha University. While the benefits are widely recognized, addressing the identified challenges requires focused efforts, strategic planning, and stakeholder collaboration. The proposed solutions offer a clear roadmap for overcoming barriers and leveraging AI to enhance educational quality and innovation at Bisha University

The results suggest that addressing the challenges of AI implementation requires a multifaceted approach, prioritizing cultural transformation, expert recruitment, strategic planning, and cybersecurity. While infrastructure and budgetary support remain essential, fostering awareness and building expertise within the university are immediate priorities. These findings provide actionable insights for decision-makers at Bisha University to effectively enhance AI adoption in higher education.

This study aimed at delving into the advantages and challenges of using artificial intelligence (AI) in education from the perspective of academic staff members at Bisha University in Saudi Arabia. This study has insinuations in that it could be utilized by staff members at Bisha University and other Saudi universities to adopt AI technologies in education because of their tangible advantages and quantifiable benefits. This finding confirms Hathnawi and Najm (2019) idea that the usefulness of incorporating new technologies in systems of higher education to increase efficiency, engagement,

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and results of learning and learning achievements. The findings of this research agreed with the results of Kuleto et al. (2021) who showed that AI and machine learning (ML) are pivotal technologies that boost learning, mainly through students' skills, cooperative learning in higher education institutions, and an available study landscape. Moreover, the results of the recent study agreed with that of Abou Karroum et al. (2024) who showed a strong correlation between participants' understanding of AI-related risks in education and their perceptions of AI's influence on the university education system, highlighting the intricate relationship between awareness and attitudes towards AI in education .The results of this study also agreed with that of Vera(2023) who underscored the significance of considering students' enthusiasm level and instructors' pedagogical and technological competence when integrating AI into the EFL classroom

5.1. Recommendations

Research Recommendations:

1. Adopt AI Technologies: Educational institutions should embrace AI technologies to leverage their clear and significant benefits in enhancing learning outcomes.

2. Address Challenges Effectively: Focused efforts should be made to tackle the challenges hindering AI integration, such as the shortage of expertise and inadequate infrastructure.

3. Promote Awareness and Expertise: Awareness of the importance of AI in education among educators, administrators, and students should be enhanced. Specialized AI experts should be recruited and developed with schools and universities.

5.2. Suggestions

1. Further Studies: Conduct additional research focusing on the effective use of AI in education and its impact on learning outcomes.

2. Training Programs: Organize targeted training programs for educators in universities and schools to equip them with the skills and knowledge necessary for effectively utilizing AI technologies.

3. Infrastructure Development: Investigate and implement strategies to strengthen the digital infrastructure needed to support AI integration in higher education.

Declarations

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