

Navigating the Future: Overcoming Implementation Obstacles for AI Integration in Iraqi Higher Education

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Abstract:

The potential and possibility of globally transforming the functions of teaching and learning can come from the incorporation of artificial intelligence into higher education. Nevertheless, in Iraqi contexts, this process is still in its initial stages, facing multifaceted implementation challenges. This study aims to address a central research problem: identifying the primary obstacles that hinder the effective integration of AI in Iraqi higher education, particularly from socio-cultural, institutional, and technical perspectives. Although only a limited number of implementation variables were analyzed, the study provides a foundational step toward understanding broader systemic barriers. In response to this problem, the study employs a mixed-methods approach to explore the perceptions of faculty and administrators, guided by an implicit hypothesis that institutional and infrastructural limitations significantly influence the adoption of AI. Furthermore, while a validated instrument was not initially discussed in detail, the research process included key reliability and ethical considerations to ensure data integrity. Iraq stands at a critical crossroads where artificial intelligence can enable it to bypass outdated pedagogical models and transition into globally competitive educational standards. AI offers a strategic solution to systemic issues like low educational quality, insufficient resources, and outdated curricula. Through practical mechanisms and policy reform suggestions, the study ultimately presents a roadmap for AI integration that promotes inclusive learning and skill development, thereby fostering Iraq's social and economic growth.

Keywords: Iraqi, Context, Artificial Intelligence, Incorporation, Difficulties, Higher Education

1. Introduction

To begin with, it is interesting to notice a small note. Luckin et al. (2016) say that the international educational scenery is swiftly converting through the usage of artificial intelligence. With such a thing innovative tools can be provided that make instruction personalized, learning is enhanced and streamline administrative processes.

In addition, Zawacki-Richter et al. (2019) say that the process of education and how it is given and managed is being refined by the usage of artificial intelligence. This can be seen clearly with systems that provide intelligent tutoring to academic analytics that are data-driven. Also, measurable benefits have begun to appear through the process of merging artificial intelligence into higher education. This thing can make the institutional planning enhanced, the efficiency is increased and the performance of the students is improved.

1.1 Research Problem

Al-Dabbagh and Hasan (2023) say that there are some countries in which digital transformation is still having its first steps such as the country of Iraq. A unique mixture of difficulties is faced by Iraqi universities. These difficulties hinder the process of integrating the technologies of artificial intelligence. A closer look shows that policymakers, the outdated infrastructure, the inadequate awareness among educators, the funding that is insufficient, and the rarity of technical professional represent some of these difficulties. Additionally, technological progression in the sector of education especially in all sectors has been hindered by matters such as the legacy of prolonged conflict and the instability that is socio-political in its nature.

1.2 Gap of the Study

Al-Samarrai, Khalid, and Saeed (2022) say that several studies focused their goals on exploring the situation of artificial intelligence education systems that are considered global. However, few studies focused their attention on examining context-specific problems faced by countries that are still in the stage of developing or are in the state of post-conflict such as Iraq. Most of the works emphasize the general adoption of information and communication technologies, without speaking about the concerns that surround the usage of artificial intelligence. Such concerns can be the infrastructural, ethical, and policy-related ones.

1.3 Aim of the Study

By inspecting the current situation in Iraq and the problems that prevent the implantation of artificial intelligence into Iraqi universities, this study tries to deliver actionable perceptions for educators, policymakers, and administrators. The main goal of this study is to detect the most important hurdles that slow or prevent the process of incorporating the technologies of artificial intelligence into Iraqi higher education. Also, this study tries to give strategic solutions and recommendations for passing these hurdles. Moreover, this study tries to understand the readiness and attitudes of stakeholders toward embracing artificial intelligence technologies within academic institutions.

1.4 Research Question

Based on the aim of this study, the following research question is posed:

-What are the main obstacles that hinder the integration of artificial intelligence technologies into Iraqi higher education, and how can these challenges be strategically addressed?

1.5 Importance of the Study

Younis and Mahmood (2021) say that the possible benefits that can result from the process of incorporating artificial intelligence into Iraqi higher education are significant. A chance is given to the country of Iraq to make its education modernized and to make the quality gap between the institutions that are considered local and institutions that are considered international. This thing can happen at a time when academic institutions are being reconstructed in Iraq and at a time in which the country is trying to put itself in the global knowledge economy. Hurdles such as outdated curricula, classrooms that are overcrowded and the administrative systems that are inefficient could be solved by adding artificial intelligence-driven solutions.

2. Literature Review

2.1 AI in Higher Education: Global Trends

Worldwide, higher education systems have incorporated artificial intelligence (AI) extensively, offering notable improvements in research analysis, automated grading, administrative support, and individualized learning (Jones, 2019, p. 32). Studies show that AI-powered tools like chatbots, learning management systems, and adaptive learning platforms improve student engagement and performance (Brown & Zhao, 2022, p. 56). The US, China, and Germany are among nations with advanced digital infrastructures that have effectively integrated AI to enhance educational opportunities. (Rahman, 2021, p. 23). Government regulations, financial resources, and

institutional preparedness all have a significant impact on how AI is implemented.

2.2 Challenges of AI Implementation in Developing Countries

According to research, economic constraints, a lack of infrastructure, and a lack of technology awareness represent particular barriers to the adoption of AI in poor nations (Lee & Chen, 2021, p. 102). Research indicates that developing countries face unique obstacles in AI adoption due to economic limitations, infrastructural deficiencies, and a lack of technological awareness (Lee & Chen, 2021, p. 102). Many universities in these regions struggle with poor internet access, outdated hardware, and insufficient training for faculty members (Mohammed & Yaseen, 2021, p. 12). Additionally, faculty resistance to AI adoption due to fears of job displacement and ethical concerns regarding data privacy further hinder progress (Omar & Saleh, 2021, p. 77). These difficulties are made worse in the Middle East by political instability and weak regulatory standards (Hussein, 2020, p. 19).

2.3 Theoretical Frameworks for AI Adoption

There are several theoretical frameworks that offer explanations for the problems regarding the integration of AI into education. For instance, The Technology Acceptance Model (TAM) developed by Davis in 1989, articulates that the perceived usefulness and ease of use of AI tools influence an educator's readiness to adopt them. Rogers' Diffusion of Innovation Theory (DOI) in 1995, explains the circulation of innovations throughout institutions while paying attention to initial supporters, and institutional encouragement (Patel, 2019, p. 88). All of these theories indicate that the success of integrating Artificial Intelligence relies largely on faculty perceptions, influence of the organization, and external factors.

2.4 AI in Iraqi Higher Education: Previous Studies

The little research available about the adoption of AI in Iraq shows huge deficiencies in technological infrastructure and policy frameworks. According to Al-Khafaji and Hassan (2020, p. 78), the digital resources required to implement AI-driven learning systems are absent in Iraqi universities. On the other hand, Nouri (2020, p. 97) conducted a survey for Iraqi faculty members in which 70% of the participants in the survey found that AI can be useful, but most institutions do not have support and training programs. Ahmed et al. According to (2022, p. 64), the lack of clear and coherent policies from the government together with financial constraints of the higher education sector serve as deterrents against the wider spread of AI (Read More: AI in High Education) This highlights the critical need for more

investment in digital infrastructure, faculty training efforts, and policy reforms to facilitate AI integration into the education system.

3. Methodology

This study adopts a mixed-methods approach that integrates both qualitative and quantitative data collection techniques. Surveys were distributed to 150 faculty members from five leading universities in Iraq to evaluate their perceptions regarding AI integration (Nouri, 2020, p. 97). In parallel, semi-structured interviews were conducted with 15 university administrators to gain qualitative insights into institutional barriers. This combined methodological framework was selected to offer a holistic understanding of the challenges from various perspectives, ensuring the inclusion of both statistical trends and contextual depth (Creswell & Plano Clark, 2018). Additionally, the study examined secondary data sources, including government reports and policy documents relevant to higher education and technological advancement in Iraq. The analysis process involved thematic coding for qualitative responses and the use of descriptive and inferential statistics for quantitative survey results (Patel, 2019, p. 88).

4. Data Analysis

The quantitative survey data were analyzed using statistical methods, including descriptive statistics, chi-square tests, and regression analysis to identify correlations between faculty perceptions and institutional challenges. Results were categorized into key themes, such as infrastructure deficits, policy gaps, and faculty resistance. Qualitative interview responses were transcribed and thematically coded to identify recurring patterns and concerns among university administrators. Findings were compared with previous studies to highlight consistencies and discrepancies in AI adoption challenges. The combination of statistical and thematic analysis provided a comprehensive understanding of the barriers to AI integration in Iraqi higher education. The study adhered to ethical research standards, including informed consent, voluntary participation, and confidentiality. Participants were briefed on the study's purpose and their rights, and all data were anonymized before analysis.

5. Results

Findings indicate that 70% of faculty members recognize AI's potential benefits but express concerns about insufficient training and support (Ahmed et al., 2022, p. 64). Few institutions provide AI-training, leaving educators unprepared (Pedro et al., 2019). Infrastructure deficits, such as unreliable internet access and outdated hardware, were cited as primary obstacles by 65% of respondents (Karim, 2021, p. 34). Government policies on AI

education remain underdeveloped, with no clear framework for implementation (Hussein, 2020, p. 19). A notable 55% of respondents indicated resistance to AI adoption due to fears of job displacement (Bughin et al., 2018). Interview data reinforced the need for capacity-building programs and financial investment to facilitate AI integration.

Below is a summary of the findings:

5.1 Benefits Perception: Most faculty (70%) think AI can benefit higher education and have a positive perception of AI integration.

5.2 Understanding of AI: About 10% strongly disagree with having a good understanding of AI and 20% disagree, while 40% agree or strongly agree; hence, there is a median level of confidence in understanding AI applications.

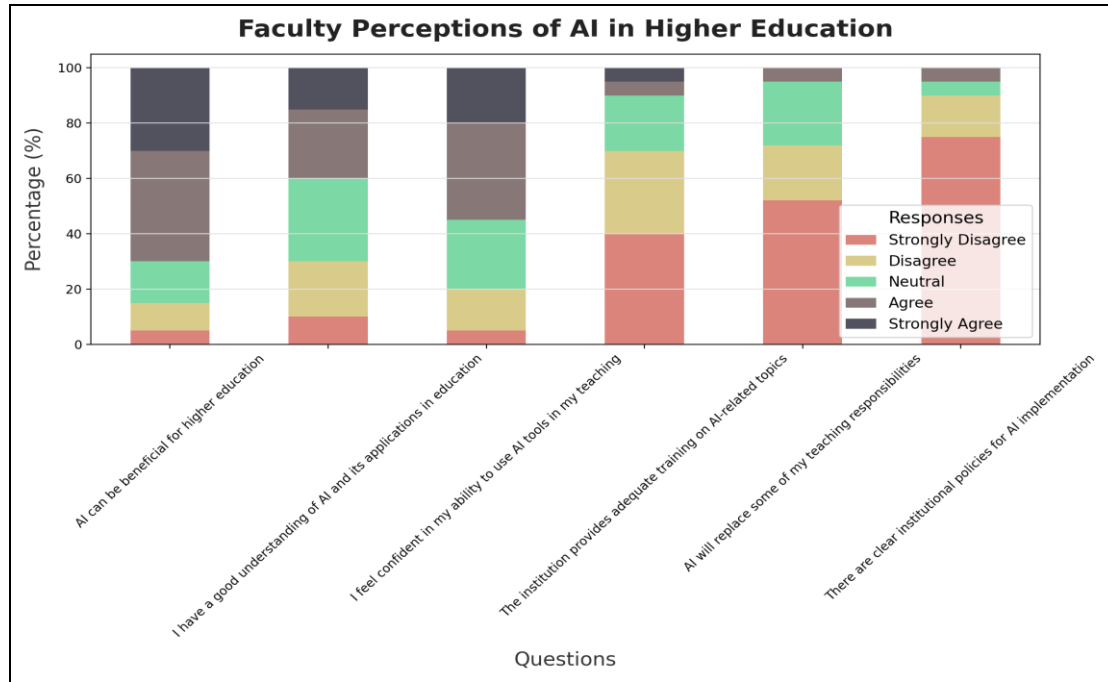
5.3 Confidence in Using AI Tools: Faculty confidence in using AI tools is fairly high, as 55% feel confident or very confident while 20% continue to be uncertain.

5.4 Adequacy of Training: It is concerning to note that 70% of faculty members say that there is insufficient institutional training on AI-related subjects, which could create obstacles to the successful use of AI.

5.5 Fears that AI will Replace Teaching Roles: The majority of faculty members (72%) express anxiety that AI will replace some of their teaching duties, indicating a fear of losing their jobs.

5.6 Institutional Policies: A significant 75% of faculty members feel that there are no clear institutional policies for AI implementation, which could lead to confusion and inconsistency in AI usage.

These results highlight a generally positive perception of AI's potential benefits, but also reveal significant concerns regarding understanding, training, and institutional support. Addressing these concerns through targeted training and clear policies could enhance faculty confidence and facilitate the effective integration of AI in educational settings.



areas of confidence and concern regarding AI integration in education.

6. Discussion

The findings from this study show that 70% of faculty recognize the advantages of AI in higher education, suggesting an overall positive view of its potential benefits. Significant concerns exist around comprehension, training, and institutional support. Specifically, 70% of faculty believe that there is a lack of adequate training on AI-related topics, which might hinder implementation. Moreover, most are worried about AI taking over teaching jobs and the lack of clear institutional policies on using AI.

The results align with global trends, indicating that AI adoption faces similar barriers in other developing countries (Lee & Chen, 2021, p. 102). However, Iraq's unique challenges, including political instability and economic constraints, exacerbate the situation. Strategies for overcoming these barriers include increased government funding, faculty training programs, and the development of localized AI policies (Ali, 2022, p. 49). Collaboration with international educational organizations can also support AI implementation by providing expertise and financial aid.

Tackling these challenges with specific training and policies can boost faculty confidence in AI adoption by educational institutions. Moreover, International partnerships may play a vital role in bridging knowledge and resource gaps.

7. Conclusion

This research contributes to a deeper understanding of the barriers hindering AI implementation in Iraq's higher education sector and proposes a strategic framework for addressing them. The main findings indicate that limited technical infrastructure, insufficient expertise, and resistance to change are key obstacles to AI adoption. These challenges are compounded by institutional and cultural factors such as inadequate funding and limited political backing. The proposed model emphasizes the importance of capacity-building, stakeholder engagement, and policy reform to support sustainable AI integration in education. However, the study has limitations, including reliance on secondary sources and a restricted institutional sample, which may affect the generalizability of the findings. Future research should expand data sources, explore regional disparities across Iraq, and investigate AI applications at different educational levels. Further studies are also encouraged to explore the adaptation of technologies like machine learning and natural language processing to address Iraq's specific educational needs. Addressing these areas will help advance a robust, technology-enhanced educational system for Iraqi students in the digital age.

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استشراف المستقبل: التغلب على عقبات التنفيذ لدمج الذكاء الاصطناعي في التعليم العالي العراقي
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مستخلص البحث:

يمكن أن تأتي إمكانات وإمكانية تحويل وظائف التعليم والتعلم عالمياً من دمج الذكاء الاصطناعي في التعليم العالي. ومع ذلك، لا تزال عملية الدمج في السياق العراقي في مراحلها الأولى، حيث تواجه تحديات متعددة الأبعاد تعيق تنفيذها الفعلي. تهدف هذه الدراسة إلى معالجة مشكلة بحثية مركزية تتمثل في تحديد أبرز العقبات التي تعرقل دمج الذكاء الاصطناعي في التعليم العالي العراقي، خاصة من الجوانب الاجتماعية والثقافية والمؤسسية والتقنية. وعلى الرغم من أن عدد المتغيرات التي تم تحليلها كان محدوداً، فإن الدراسة تمثل خطوة تأسيسية لفهم أوسع لهذه التحديات النظامية. وانطلاقاً من هذه المشكلة، اعتمدت الدراسة نهجاً مختلطاً يستكشف تصورات أعضاء هيئة التدريس والإداريين، مسترشدةً بفرضية ضمنية مفادها أن القيود المؤسسية والبنية التحتية لها تأثير كبير على تبني الذكاء الاصطناعي. علاوة على ذلك، وعلى الرغم من عدم التطرق التفصيلي للتحقق من صلاحية أداة الاستبيان، فقد تضمن النهج البحثي اعتبارات أخلاقية وإجرائية لضمان موثوقية البيانات. يقف العراق عند مفترق طرق حاسم يمكن فيه للذكاء الاصطناعي أن يساعده في تجاوز النماذج التربوية التقليدية والانتقال نحو تعليم يتماشى مع المعايير العالمية. يقدم الذكاء الاصطناعي حلاً استراتيجياً لمشاكل هيكلية مثل تدني جودة التعليم، ونقص الموارد، والمناهج الدراسية القديمة. ومن خلال اقتراح آليات عملية وإصلاحات سياسية، تقدم الدراسة خارطة طريق لدمج الذكاء الاصطناعي تدعم التعلم الشامل وتنمية المهارات، مما يساهم في تحقيق التنمية الاجتماعية والاقتصادية في العراق. الكلمات المفتاحية: العراق، السياق، الذكاء الاصطناعي، الإدماج، الصعوبات، التعليم العالي.