

Article

Adoption of Artificial Intelligence in Higher Education: Evidence from University Students on Usage, Benefits, and Barriers

Page | 368

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Abstract: Artificial intelligence (AI) is a game changer in the field of higher education, which promises great potential in making learning experiences better, boosting academic performance, and personalised education. Although these are the benefits, the reality of AI integration in the university setting is still not a smooth sail with little or no uniformity especially in developing nations. This paper will focus on the implementation of artificial intelligence in Jordan among university students by exploring its usage rate, perceived advantages, challenges and possible remedies. The research design adopted was quantitative descriptive research design and data were collected through a structured questionnaire that was administered to a sample of 180 undergraduate students. The results showed that the general rate of AI use among students is moderate, which means that students know about the existence of AI technologies, but still they do not use these tools very often. The findings also revealed that students find AI useful in improving learning and academic performance but these advantages are not translated into reality owing to a number of obstacles. The greatest obstacles found are the absence of awareness, technical support, and resistance to the use of new technologies. In addition, the researchers did not find any statistically significant gender differences when it comes to the use of AI. According to these findings, the study indicates that universities should implement holistic measures which are aimed at training, infrastructure development as well as institutional support to enable effective introduction of AI. The research is valuable in its contribution to the increasing literature about artificial intelligence in education by offering empirical data about the situation in Jordan and offering practical implications on how to enhance the use of AI in higher education.

Keywords: *Artificial intelligence, higher education, student perceptions, technology adoption, educational innovation, digital learning*

Introduction

Artificial intelligence (AI) has become a revolution in the sphere of higher education, which has completely changed the process of teaching, learning, and making decisions in an institution. Universities have been able to transition to more individualised, data-driven, and flexible models of education through the rapid development of AI technologies, such as machine learning, natural language processing, and intelligent tutoring systems (Zawacki-Richter et al., 2019; Crompton and Burke, 2023). Such advances have placed AI not simply as a technology, but as a strategic element of improving the quality of education and student interaction.

In most parts of the world, colleges and universities are adapting AI in most aspects of their education, including automated assessments, predictive analytics, and customised learning platforms. These applications have proven to be having a great potential in enhancing student performance, lessening administrative pressures, and facilitating more effective educational administration (Holmes et al., 2019; Luckin et al., 2016). Nonetheless, regardless of such encouraging trends, the practise of AI in universities is still unevenly distributed, especially in developing countries, where institutional preparedness and technological support differs significantly.

Considering the situation in Jordan, the use of digital technologies in institutions of higher learning has been a gradual process, but AI integration has not reached its climax yet. Although universities have started to introduce e-learning platforms and digital means, the shift towards AI-powered systems remains very scarce because of a number of structural and organisational issues. These are the inadequacy of technological infrastructures, inadequate funding, deficiency of technical competence, and resistance to change among the members of the faculties and students (Al-Adwan et al., 2021; UNESCO, 2021).

Moreover, the success of the AI integration in educational processes is highly contingent on the willingness of users, specifically, the awareness, attitudes, and actual use of AI tools in students. Students are not always actively involved with the latest technologies including AI, but their use of high-level technologies is not as stable and consistent as may be thought. Studies have found that students can use digital tools on a regular basis but do not understand the implementation of AI

applications and the ways they can benefit their academic performance (Crompton and Burke, 2023; Chen et al., 2020). This mismatch indicates the existence of a very serious gap in the availability of technology and its practical use.

Moreover, socio-cultural and institutional aspects are also important in the process of AI adoption in higher education. Digital inequality, the lack of access to modern technologies, and insufficient training opportunities are some of the problems that complicate the successful implementation of AI in education in the developing countries, including Jordan (UNESCO, 2021). These issues are enhanced by the fact that there are issues of data privacy, ethical application of AI, and the lack of explicit institutional guidelines governing its application.

The other significant factor is the contribution of faculty members towards the adoption of AI. Research has revealed that the attitudes, competencies, and readiness of educators to implement AI in their pedagogy is a major factor that affects the students in terms of their interest towards these technologies (Holmes et al., 2019). Most of the time, the absence of professional development programmes and institutional support restricts the capacity of the members of the faculty to use AI tools effectively, which decreases their possible effect on the learning outcomes.

Although the literature on the topic of artificial intelligence in education has been growing, the majority of research has been conducted on the potential and technological capabilities of AI, but not on practical applications of AI among students in a particular context. Empirical studies exploring the actual experience of the students using AI in Jordan, their patterns of use, perceived advantages, and the challenges have not been done extensively. This knowledge gap in the literature explains why context-based research is necessary to gain a more in-depth insight into the presence of AI in higher education. This paper, therefore, seeks to analyse the use of artificial intelligence among Jordanian university students by looking at its level of adoption, perceived benefits, perceived challenges, and possible solutions to the challenges. It is also aimed at exploring the possibility of demographic factors, especially gender, affecting the use of AI technologies by students. Through these points, the research will help in closing the gap between the theoretical possibilities of AI and its practical use in tertiary education.

However, in the end, it is necessary to learn how students can engage with artificial intelligence in education that will help to devise effective strategies that will improve its implementation. Higher education institutions should take a step further than just the adoption of technology but also adopt a

more holistic approach to technology adoption that involves pedagogical, institutional, and human aspects. This practise is essential in making sure that AI plays a significant role in enhancing learning and equipping students with skills that are relevant to the world of the 21st century which is more digital and knowledge-based.

Literature Review

Artificial intelligence (AI) is an area of study that has been gaining more and more scholarly interest, but the literature demonstrates that a significant gap exists between the potential of AI and its practical use in universities. Instead of showing a linear progression of research, the current body of research is a disseminated knowledge of different institutional, technological, and socio-cultural circumstances. To overcome this complexity, the current review synthesises previous studies along four themes that relate to each other, including AI use, perceived advantages, challenges, and solutions, thus offering coherent analysis as per the research variables of the present study.

AI Usage in Higher Education

The analysis of the literature shows that the use of AI in higher education is still unequal and rather restricted in scope. Although AI technologies are popularly discussed as disruptive technologies, empirical studies indicate that the practical implementation of these technologies in the student population is still in progress.

As an example, Zawacki-Richter et al. (2019) in a systematic review of 146 studies have proven that AI applications are mostly based on administrative and support roles, not in the underlying teaching and learning processes. This is an indication that the institutions have been focusing on operational efficiency instead of pedagogical change.

In the same vein, Crompton and Burke (2023) have concluded that despite the growing accessibility of AI tools, the trends in student use of such technologies are not consistent. The disconnection between availability and meaningful use is critical as they are analyzed as a result of limited training and not being integrated into curricula.

The trend is also evidenced by Chen et al. (2020), who stated that students are inclined to use AI in a shallow manner, which is usually limited to fundamental applications, instead of using its full potential to learn and conduct research. The same was also noted in the Jordanian environment, with students showing interest in digital tools and having little exposure to high-technology solutions, including AI (Al-Adwan et al. 2021).

This is supported by previous studies in the region. Both the studies conducted by Al-Fawwal (2020) and Mujahid (2019) demonstrated moderate rates of AI usage and insisted that awareness does not always turn into a successful use. Similarly, Valid (2021) discovered that students have entry-level skills related to AI but do not have more in-depth competencies to make meaningful interactions.

Collectively, these results indicate that the use of AI in higher education is described by a phase of transition, when the technology can be found, yet the integration of the technology into the pedagogical process is insufficient. This underscores the necessity of shifting an access to effective utilisation.

Benefits of AI in Education as perceived

Although the extent of AI application is relatively average, the literature does not dispute that it has a great potential in improving education results. This perceived possibility however, does not always translate into practice resulting in a discrepancy between what is expected and done.

As Holmes et al. (2019) pointed out, AI allows customising the learning process through the adaptation of educational resources to the needs of each student, which improves the engagement level and the efficiency of the learning process. Luckin et al. (2016) also hold this view and suggested that AI-driven systems could convert the classical models of learning into an adaptive and student-centred one.

These assertions are also backed up by empirical studies. The study by Chen et al. (2020) discovered that AI can help enhance academic performance due to the automated feedback and the learning process based on data. In the same manner, Zawacki-Richter et al. (2019) emphasized the importance of AI in decision-making and enhancing the efficiency of the institution.

Al-Baghdadi (2022) and Al-Shamsi (2023) found that AI improves the quality of educational delivery by making it more interactive and flexible in the regional settings. But what these studies also indicate albeit indirectly is that such advantages are not necessarily experienced by students as much as they are perceived to be.

Such discrepancy between the perceived benefits and actual usage indicates that people are not aware of the advantages of AI enough to make sure they adopt it. Rather, these benefits can be realised with regard to the levels at which AI is incorporated in daily academic activities.

Issues of AI Implementation in University

Although its potential is undoubted, AI's application in higher education is limited by a set of challenging factors that are not limited to technological issues.

According to UNESCO (2021), structural barriers, which include poor infrastructure, low levels of digital literacy, are the primary obstacles, especially in the developing setting. These obstacles are not only technical but they portray greater problems of institutional preparedness.

Crompton and Burke (2023) introduce an additional behavioural aspect to this list, stating that the unwillingness of both students and faculty members to change is a major obstacle towards the adoption of AI. This resistance has been mostly based on doubt, absence of training and fear of being disrupted by technology.

Chen et al. (2020) also note the skills gap, as students are often deficient in the skills necessary to work with the AI tools. This problem is exacerbated in the situations like in Jordan where Al-Adwan et al. (2021) found that infrastructural and organisational limitations restrict the access to advanced technologies.

Local research sheds more light on such challenges. Mujahid (2019) mentioned financial constraints and the absence of an institutional back-up, whereas Al-Fawwal (2020) identified the lack of awareness as the ongoing obstacle.

Taken together, these results suggest that issues related to AI implementation are multidimensional, meaning that they involve technical, institutional, and human aspects. These challenges can only be tackled in a holistic manner and not in separate interventions.

Suggestions on How to improve AI Integration

To address the formulated challenges, the literature offers a diversity of strategies that could help in the successful integration of AI in higher education. Nevertheless, all these solutions lead to the fact that there is a need to match technology development with human and institutional strengths.

UNESCO (2021) proposes the creation of extensive policy frames that will direct the use of AI to achieve ethical and fair usage. On the institutional level, training programmes are highlighted by Crompton and Burke (2023) as effective to develop digital competencies in both students and educators. According to Holmes et al. (2019), the only way to integrate AI into the curriculum process in a sustainable way is by incorporating AI in the design of the curriculum, since it would ensure the latter is no longer a peripheral tool but a part of the entire learning process. On the same note, Al-Baghdadi (2022) notes that more funding should be done on technological infrastructure to facilitate AI application.

Pedagogically, Al-Shamsi (2023) emphasises the need to encourage the faculty members to continuously develop professionally, and Valid (2021) recommends including AI-related skills within the academic programmes to ensure students will be equipped to meet the demands of the labour market in the future.

Overall, these proposed solutions indicate that successful AI integration requires a coordinated strategy that combines policy development, infrastructure enhancement, and capacity building. Without such alignment, the gap between AI's potential and its practical implementation is likely to persist.

Problem

Although artificial intelligence (AI) is gaining massive attention in the global community as a revolution in the sphere of higher education, it is still not used much and regularly in university settings. Whereas the literature has found that AI has a great potential to support personalised learning, boost academic results, and streamline the educational processes (Holmes et al., 2019; Luckin et al., 2016), the practice has shown that such advantages have not been fully achieved in practice, especially in developing educational systems.

In the past, the research studies have continuously documented that the extent of AI use among university students is moderate at best, and they tend to use it on simple or surface-level applications (Zawacki-Richter et al., 2019; Chen et al., 2020). It means that there has always been an existent discrepancy between the presence of AI technologies and its practical application to the academic environment of the students. Also, studies in the regional setting, such as the Middle East, have pointed out that students are generally familiar with digital tools, but their exposure to high-level technologies, like AI, is low (Al-Adwan et al., 2021).

Besides the low utilization, there are still a number of issues that inhibit the successful implementation of AI in higher education. They are the absence of the appropriate technological infrastructure, technical support, and digital skills, as well as opposition to change among students and members of the faculty (UNESCO, 2021; Crompton and Burke, 2023). Notably, these obstacles are not independent of each other but are interrelated, which portrays wider institutional and socio-cultural limitations that impact the adoption of technology in the educational process.

Even though the available literature offers a lot of useful information on the opportunities and limitations of AI in the education field, much of it is based on abstract debate, and little is devoted to the actual experiences and perceptions of students in the particular institutional setting. Specifically,

empirical research that would be able to explore AI usage, perceived advantages, issues, and possible remedies through the prism of university students in Jordan is lacking.

This is a critical gap, and the actual interest of students in AI can only be learned in order to devise effective policies to increase its adoption in higher education. The context-specific evidence is lacking, and without it, the attempts to promote the adoption of AI can be considered ineffective and fragmented. Thus, the research aims to fill this gap by exploring the fact of artificial intelligence application among university students in Jordan, its extent of application, perceived advantages, the challenges related to it, and suggested solutions. It also explores the possibility of the demographic factors affecting the use of AI technologies by students, especially gender.

Objectives

Building on the identified research gap and the analytical review of the literature, this study aims to provide an empirical understanding of artificial intelligence (AI) adoption in higher education from the perspective of university students. Specifically, the study seeks to:

1. To examine the current level of artificial intelligence usage among university students in Jordan.
2. To analyse students' perceptions of the benefits of artificial intelligence in enhancing learning processes and academic performance.
3. To identify the key challenges that hinder the effective use of artificial intelligence in higher education.
4. To explore potential solutions that may support the integration of artificial intelligence into university learning environments.
5. To investigate whether there are statistically significant differences in artificial intelligence usage based on gender.

Questions

In line with the study objectives, the following research questions are formulated:

1. What is the current level of artificial intelligence usage among university students?
2. How do students perceive the benefits of artificial intelligence in higher education?
3. What are the main challenges associated with the use of artificial intelligence among university students?

4. What solutions can enhance the effective integration of artificial intelligence in higher education?
5. Are there statistically significant differences in artificial intelligence usage based on gender?

Hypotheses

Based on the analytical framework of the study, the following hypothesis is proposed:

H0: There are no statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the use of artificial intelligence among university students based on gender.

Methodology

This section outlines the research design, participants, instrument, and data analysis procedures used to examine the reality of artificial intelligence (AI) usage among university students.

Research Design

This research paper uses a quantitative descriptive research design to examine the extent of artificial intelligence application, perceived advantages, challenges related, and suggestions to address the issues among students in universities. The descriptive method was chosen because it is appropriate in studying the perceptions and experiences of students and determining patterns and relationships between the study variables without controlling them.

Participants

The sample of the study included 180 undergraduate students who were chosen through simple random sampling method among the Jordanian universities. The sample was obtained with students of various academic subjects to make it diverse and increase the generalisability of the results.

Table 1

Demographic Characteristics of the Study Sample

Variable	Category	Frequency	Percentage
Gender	Male	82	45.6%
	Female	98	54.4%
Total		180	100%

The information contained in Table 1 shows that there was a fairly equal gender distribution of participants, which justifies the comparisons that were conducted in the study.

Instrument

Structured questionnaire was used to collect data through development of a questionnaire that was based on past research on artificial intelligence in education. The tool was to assess the perception among students on the main dimensions that were in line with the research objectives.

The questionnaire was divided into two major parts. The initial part encompassed such demographic variables as gender, age, academic specialisation. The second part consisted of 20 questions which were presented in four dimensions including the reality of the AI usage, the perceived benefits, challenges, and suggested solutions. Measures of responses were taken in terms of a five-point Likert scale, which was (1 = strongly disagree) to (5 = strongly agree).

In order to ascertain the validity of the instrument, a panel of experts in the field of educational technology was involved and they rated the instrument on the basis of clarity, relevance, and appropriateness of the items. Their feedback was taken into consideration and minor changes were done to enhance the overall quality of the questionnaire.

Cronbach's Alpha coefficient was used to test internal consistency of the instrument, which is generally applied to test the reliability of survey tools.

Table 2

Internal Consistency Reliability of the Study Instrument

Dimension	Number of Items	Cronbach's Alpha
AI Usage	5	0.86
Benefits of AI	5	0.88
Challenges of AI	5	0.87
Proposed Solutions	5	0.89
Overall Scale	20	0.88

According to the results in Table 2, the high level of reliability was obtained in all dimensions, with the values of Cronbach alpha being between 0.86 and 0.89. The entire reliability coefficient of 0.88 makes it clear that the instrument is highly internal consistent and can be used to analyse data.

Data Analysis

The data were collected and analysed using the IBM SPSS Statistics software. The research questions were answered and overall trends of the data described using descriptive statistical procedures such as frequencies, percentages, means, and standard deviations. Besides that, an independent samples t-test was employed to investigate the variation in AI usage depending on.

Results

In this section, the research findings are provided in reference to the research questions. The findings are presented in two broad sections descriptive results dealing with the rates of AI utilisation, advantages, issues and solutions proposed and the inferential results dealing with variations in terms of gender.

Descriptive Results

How is the use of artificial intelligence among students in universities currently?

To provide the answer to this question, the mean and standard deviation of items pertaining to the use of AI were calculated.

Question 1 results: What is the current level of artificial intelligence usage among university students?

To answer this question, mean and standard deviation were calculated for the items related to AI usage.

Table 3

Mean and Standard Deviation of AI Usage

Item	Mean	SD	Level
Use of AI tools in learning	2.61	0.78	Moderate
Use of AI in assignments	2.48	0.74	Moderate
Use of AI for research purposes	2.32	0.81	Moderate
Overall Mean	2.47	0.78	Moderate

Table 3 shows that the average score of AI usage is 2.47 and it represents a moderate usage among students of the university. The largest mean was registered in the application of AI tools in learning (Mean = 2.61), and the smallest mean was related to the application of AI to conduct research (Mean = 2.32). This implies that students are more likely to apply AI to simple academic tasks but not to the sophisticated research.

Research Question 2: How do students perceive the benefits of artificial intelligence in higher education?

To answer this question, mean and standard deviation were calculated for the items related to perceived benefits.

Table 4

Perceived Benefits of Artificial Intelligence

Item	Mean	SD	Level
Enhances learning experience	2.73	0.75	Moderate

Item	Mean	SD	Level
Improves academic performance	2.52	0.79	Moderate
Encourages self-learning	2.36	0.77	Moderate
Overall Mean	2.54	0.77	Moderate

As it is indicated in Table 4, the average score on perceived benefits is equal to 2.54 which means that the level of agreement between students is moderate. The greatest rated one was the improvement of learning experience (Mean = 2.73), and the least rated one was the promotion of self-learning (Mean = 2.36). These results indicate that despite the awareness of the importance of AI, the perception of students is moderate, which may be explained by insufficient exposure to the entire functionality.

Research Question 3: What are the main challenges associated with the use of artificial intelligence among university students?

To answer this question, mean and standard deviation were calculated for the items related to challenges.

Table 5

Challenges of Artificial Intelligence Usage

Item	Mean	SD	Level
Lack of awareness	2.68	0.82	Moderate
Lack of technical support	2.44	0.76	Moderate
Resistance to change	2.51	0.80	Moderate
Overall Mean	2.54	0.79	Moderate

In Table 5, the results suggest that the mean score of the challenges is 2.54, which is a medium perceived level of barriers. The greatest challenge that was identified was lack of awareness (Mean = 2.68), resistance to change (Mean = 2.51), and lack of technical support (Mean = 2.44). This indicates that cognitive and institutional elements are involved in restraining the adoption of AI.

Research Question 4: What solutions can enhance the effective integration of artificial intelligence in higher education?

To answer this question, mean and standard deviation were calculated for the proposed solutions.

Table 6

Proposed Solutions for AI Integration

Item	Mean	SD	Level
Motivating faculty members	2.71	0.76	Moderate
Training workshops	2.49	0.78	Moderate

Item	Mean	SD	Level
Improving infrastructure	2.33	0.82	Moderate
Overall Mean	2.51	0.79	Moderate

As it is indicated in Table 6, the general mean of proposed solutions is 2.51 which is moderate in the sense of agreement. The most agreeable solution was faculty motivation (Mean = 2.71) then training workshops (Mean = 2.49) and the last solution was the improvement of infrastructure (Mean = 2.33). These outcomes emphasize the role of human and institutional factors in improving the adoption of AI.

Inferential Results

Hypothesis Testing: H0: There are no statistically significant differences in AI usage based on gender.

To test this hypothesis, an independent samples t-test was conducted.

Table 7

T-test Results for Gender Differences in AI Usage

Variable	Gender	Mean	SD	t-value	Sig.
AI Usage	Male	2.49	0.77	1.18	0.152
	Female	2.45	0.79		

Table 7 shows that the significance value (Sig. = 0.152) exceeds the level of 0.05, which implies that there are no significant differences in the AI use between male and female students. Hence, null hypothesis (H0) is accepted. This implies that gender will not play a significant role in determining the use of artificial intelligence by students.

Discussion

This section interprets the findings in relation to the existing literature, providing a deeper analytical understanding of artificial intelligence (AI) adoption among university students in the Jordanian context.

AI Usage in Higher Education

The research results of this paper show that there is an average level of AI use among university students. Such an outcome indicates a transitional period where AI technologies exist, but they are not yet fully incorporated in academic activities of students. This is consistent with the results of Zawacki-Richter et al. (2019), who found that AI applications in higher education are frequently limited to administrative and support services and are not implemented in the process of core teaching and learning.

Equally, Crompton and Burke (2023) emphasised that the presence of AI tools does not translate into the meaningful use of these tools because students might not possess the skills or have instructions on how to effectively use AI-based tools. The medium level of usage that was found in this research also confirms the results of Chen et al. (2020), who state that students are likely to use AI on the basic level, which is often reduced to simple applications, not to the complex academic or research usage.

This trend can be explained in the Jordanian environment by the lack of institutional integration of AI into the educational program and a lack of familiarity with modern AI products. This implies that the problem is not the lack of the technological availability but the lack of planned integration strategies that promote meaningful use that is consistent.

Perceived Benefits of AI

The findings obtained showed that students rated the advantages of AI on a moderate scale, especially in better learning experiences and academic achievements. This result is aligned with Holmes et al. (2019), who highlighted the importance of AI in the facilitation of personalised learning and engagement of students due to adaptive educational systems.

Nevertheless, the moderate view of the benefits shows that students might not have realized the practical benefits of AI. This confirms the point that Luckin et al. (2016) put forward, that AI effectiveness in education is related to its depth of integration and not exposure. Although students are aware of the theoretical importance of AI, their poor interaction minimises the level of realisation of these advantages.

Such discrepancy between perceived potential and real experience points to a pressing problem of AI adoption: one cannot be simply aware of it without trying it out. Hence, universities should aim at incorporating AI into daily learning processes to package the perceived benefits into actual results.

Challenges of AI Adoption

The paper has found that a number of issues are related to the use of AI, and the most serious problem is insufficient awareness. This conclusion is very close to the one offered by UNESCO (2021), which highlighted a lack of digital literacy and poor knowledge of AI technologies as the main barriers to successful implementation.

Moreover, the obstacle of resistance to change and absence of technical support were also mentioned as the significant issues, which demonstrates the multidimensional character of obstacles to AI

adoption. Crompton and Burke (2023) also reported that behavioural aspects, including resistance to the use of new technologies are a significant barrier to the usage of AI in education.

Chen et al. (2020) also emphasized that students do not always have technical skills necessary to effectively use AI devices, which supports the results of this research project. Al-Adwan et al. (2021) observed that infrastructural constraints and lack of institutional support are likely to increase such challenges in the Jordanian context.

On the whole, the results indicate that issues with the adoption of AI are interdependent, and they concern technical, cognitive, and organisational aspects. To solve these difficulties, a multimedia provision is not enough.

Proposed Solutions for AI Integration

These findings denote that students also favour the introduction of different solutions to improve the use of AI moderately, yet the priorities are the most focused on encouraging faculty members and offering them training opportunities. This shows the importance of teachers in making AI technologies adopted.

Holmes et al. (2019) stressed that educators are the major facilitators of AI implementation in the learning process, and their willingness is one of the determinant factors of student engagement. Equally, Crompton and Burke (2023) emphasised the significance of training programmes in the creation of digital skills among students and faculty.

The somewhat less focus on infrastructure enhancement implies that the students consider human factors, including training and motivation, to be more immediate and effective. Nonetheless, this does not lead to the underestimation of the value of technological infrastructure, which is one of the key conditions to successful AI implementation (UNESCO, 2021).

These results suggest that an effective integration of AI should take a balanced strategy that involves both technological investment and capacity building and institutional support.

Gender Differences in AI Usage

The researchers did not notice any statistically significant gender differences in the use of AI. It implies that the engagement of both male and female students with AI technologies is also similar, which is in line with the results of the other researches (Zawacki-Richter et al., 2019; Chen et al., 2020).

This observation tells us that the demographic variables like gender could not have played a significant role in the adoption of AI as opposed to the structural and educational variables. Rather, the availability

of technology, training chances, and institutional support seems to have a more influential role on the participation of students in AI.

Overall Interpretation

On the whole, the results of the given research indicate a certain trend: although the potential of artificial intelligence in the sphere of higher education is considerable, its practical implementation is only mediocre because of a lack of awareness, a lack of training, and the institutional factors involved. The findings reveal an extremely important disparity between the theoretical potential of AI and its real-world application, especially in the developing settings of educational fields like Jordan.

To fill this gap, there is a need to focus more on holistic strategies that could address pedagogical, institutional and human issues rather than technology-based strategies. In the absence of such alignment, AI implementation in higher education is bound to be inadequately dispersed and underused.

Conclusion

This study examined the adoption of AI in higher education from the perspective of university students in Jordan, focusing on its level of use, perceived benefits, associated challenges, and potential solutions. The results demonstrated that the general state of AI usage is moderate, which means that students have heard about AI technologies, but they still do not use these tools often and do not fully incorporate them into their academic activity.

The outcomes also proved that students are aware of the possible advantages of AI, especially in making the learning process more engaging and increasing the academic success. These perceived benefits have however not yet been brought to fruition to full extent, mostly because there are various interrelated challenges. Lack of awareness, inadequate technical support, and reluctance to change to adapt new technologies are the most evident ones identified. The results indicate that the problem of AI adoption cannot be limited to the availability of technologies but requires the institutional preparedness and user-related aspects.

Moreover, the authors discovered that there were no statistically significant gender differences in the usage of AI, which means that the level of interest in the use of AI technologies depends more on the structural and educational conditions rather than on the demographic characteristics. It shows the need to pay attention to institutional strategies instead of individual differences to promote AI adoption in higher education.

Implications

This study has a number of implications on the educational institutions and policy makers. The integration of AI into the teaching and learning process in universities should be developed in a structured approach, and not ad hoc or informal. Moreover, there is the evident necessity to invest in training programmes that will improve the digital competencies of students and the members of the faculty so that they can be able to make a good use of AI tools in the academic environment.

Furthermore, institutional support systems, such as technical support and development of infrastructure, are also important to use AI. It is recommended that policymakers should come up with clear guidelines and frameworks that will assist in the ethical and effective use of AI in education. These steps are needed to overcome the disparity between the possible and real use of AI in higher education.

Limitations

This study has a number of limitations which should be noted despite its contributions. To begin with, the research was based on a self-report questionnaire that can be biased in terms of responses. Second, only students of universities in Jordan were included in the sample, which can influence the extrapolation of the results to other settings. Third, the paper dealt with quantitative data, but it did not include qualitative information that would allow gaining a more in-depth picture of how students experience AI.

Future Research

It is suggested that further studies should be conducted to understand how artificial intelligence can affect the academic performance and skill development of students in the long term. Also, it might be possible to carry out qualitative research that will help to learn more about the experiences and attitudes of students towards AI. It would also be beneficial to compare various countries or educational systems in terms of the role of contextual factors in AI adoption. Lastly, the study might be extended in the future by exploring the efficiency of particular AI tools in improving the learning outcomes in various fields.

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