Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

# Future expectations for faculty roles at Yarmouk University in light of AI-based learning

Miesam Fawzi Motiar Al Azam *

*College of Education, University of Hail, Hail, Saudi Arabia*

ARTICLE INFO

*Article history:*
Received 13 June 2024
Received in revised form
12 October 2024
Accepted 19 October 2024

*Keywords:*
Faculty roles
Artificial intelligence
Teaching methods
Technical performance
Educational activities

ABSTRACT

This study aimed to examine future expectations for faculty roles at Yarmouk University in the context of artificial intelligence (AI)-based learning. Using a descriptive approach, the researchers employed a questionnaire as the primary tool, with a sample of 140 faculty members from the College of Education. Results indicated that the first category, related to teaching methods, received a weighted average of 4.55, indicating strong agreement. Similarly, the second category of communication scored a weighted average of 4.57, which also reflects strong agreement. The third category, focusing on technical performance, achieved a weighted average of 4.59, showing strong agreement, while the fourth category, addressing educational activities, received a weighted average of 4.58, indicating strong agreement. Overall, the combined categories had an average weighted score of 4.58, suggesting strong agreement on the roles of faculty members at Yarmouk University within an AI-based learning environment. Additionally, significant differences emerged among respondents based on gender, college affiliation, and years of experience; however, no significant differences were found based on academic rank.



## 1. Introduction

Several key changes are needed to improve the quality of education. According to (WEF, 2020), there are four main benefits that artificial intelligence (AI) offers in education. The first is supporting teachers through augmentation and automation. AI can simplify tasks, allowing teachers more time for meaningful interactions with students by automating routine tasks and focusing on human-centered teaching. However, it is crucial that AI enhances rather than replaces the role of teachers, as teaching goes beyond merely delivering information (Seo et al., 2021).

The second benefit is improving assessment and analytics. AI can speed up assessments, provide timely feedback, and analyze student performance in real-time. This allows teachers to identify student strengths and weaknesses, leading to targeted teaching strategies (Haenlein et al., 2019).

The third benefit focuses on enhancing AI and digital literacy, where AI can be used to improve technological skills (Ng et al., 2023). Finally, the fourth benefit emphasizes personalizing learning content. By using AI, educational content and experiences can be tailored to meet individual student needs (Kazanidis and Pellas, 2024).

As the world undergoes rapid changes due to technological advancements, AI has become a vital tool across various sectors, including education, for improving efficiency, solving problems, and achieving better outcomes. AI's influence in developing teaching and learning methods makes it crucial for this study, which aims to explore AI's role in university education (Almasri, 2024).

The study poses two main questions. The first question asks about future expectations for the roles of education faculty members in AI-based education. The second question explores whether responses vary based on demographic factors such as gender, college, years of experience, and academic rank.

The objectives of the study are as follows. The first objective is to measure future expectations for Education faculty members in AI-based education. The second objective is to examine the impact of AI on university education. The third objective is to identify if demographic variables (gender, college, years of experience, academic rank) influence responses. The final objective is to investigate the

* Corresponding Author.
Email Address: coamman1443@gmail.com
https://doi.org/10.21833/ijaas.2024.11.003
Corresponding author's ORCID profile:
https://orcid.org/0009-0005-1197-944X

relationship between educational activities, technical performance, communication, teaching methods, and AI-based education.

In terms of theoretical importance, this study provides a framework for understanding the future roles of faculty members with AI-based education. It also serves as a foundation for developing AI-based education at Yarmouk University. Additionally, it may reveal how factors like gender and rank influence faculty expectations of AI in education. This study also contributes to future research on AI's impact on education and enriches both regional and international academic literature.

Regarding practical importance, the study can guide efforts to improve AI-based university education. It will offer practical recommendations for enhancing educational activities, technical performance, communication, and teaching methods through AI. The findings can help faculty make informed decisions about AI's role in improving university education.

The study has several limitations. The objective limitation involves assessing faculty members' expectations about AI at Yarmouk University. Human limitations pertain to the Education Faculty at Yarmouk University, while spatial limitations focus on the College of Education at Yarmouk University, Jordan. Time limitations refer to the study being conducted in 2023.

In terms of terminology, AI is defined as a branch of computer science focused on designing systems that mimic human intelligence, such as understanding, learning, perception, and problem-solving. The procedural definition relates to how faculty members use AI in university education.

The conceptual framework discusses AI as a branch of computer science aiming to perform tasks that require intelligence. AI is essential due to its ability to create systems that imitate human capabilities, reduce human errors, and address challenges. It also facilitates growth in scientific fields by transferring human expertise to intelligent systems. AI supports personalized learning, enhancing educational outcomes through virtual interactions (Ocaña-Fernández et al., 2019; Popenici and Kerr, 2017).

AI's characteristics include symbolic knowledge representation, experimental approaches, learning from incomplete data, and problem-solving methods based on human strategies. AI offers rapid hypothesis testing and learning from past experiences.

In university education, AI processes information according to specific instructions and supports self-learning. It helps faculty consider individual differences, improve education quality, and shorten learning time. AI assists university administration in enhancing services, reducing costs, and improving transparency. Training faculty in AI can lead to effective management, better communication, and improved educational processes (Çiftci et al., 2010). The study suggests that AI enables quality performance and modernized educational services based on the skills of faculty members in AI use (Chang, 2019).

## 2. Literature review

Over recent years, many studies have focused on the future roles of university faculty members in AI-based learning. This section provides an overview of recent empirical analyses examining these roles. Efforts to ensure distinguished education for primary school students through innovative teaching methods challenge the traditional assumptions of education. For example, Aldosari (2020) explored the potential effects of AI on higher education at Prince Sattam Bin Abdulaziz University using a qualitative approach that involved asking an open-ended question to a sample of academics. The results revealed low awareness of the mechanisms for applying AI and highlighted the need to raise awareness about AI applications in education within Saudi Arabia.

Similarly, Muqeeti (2021) examined the use of AI and its impact on the performance quality of Jordanian universities from the perspective of faculty members. The study sample consisted of 370 faculty members and used a descriptive correlative approach with a three-part questionnaire: demographic data, the degree of AI use (33 items across administrative and academic domains), and the quality of university performance (28 items). The study found that faculty members rated AI use in Jordanian universities as moderate. There were no significant differences in AI use based on gender, academic rank, or years of experience, though differences were observed based on the type of college, favoring scientific colleges. Similarly, university performance quality was rated as moderate, with no significant differences based on gender, academic rank, years of experience, or college type. However, a statistically significant correlation was noted between AI use and overall university performance quality.

Albasalah et al. (2022) investigated the challenges to activating the roles of university instructors and students in Saudi universities using AI, employing a simple random sampling technique. The study found that obstacles related to scientific research objectives among teachers and students posed significant challenges to the integration of AI in research and collaboration.

Rahiman and Kodikal (2024) explored faculty members' awareness of AI and its impact on learning experiences and teacher engagement. The study confirmed that AI significantly influenced evaluation and assessment methods. Chiu (2024) examined student perspectives on the impact of AI in higher education, recommending that higher education institutions transform to train students in AI competencies and interdisciplinary approaches, with an emphasis on innovative pedagogies.

The literature review reveals a diverse range of studies addressing the future expectations for universities and AI-based learning, along with the

related variables and factors influencing their outcomes. For instance, Aldosari (2020) highlighted low awareness of AI applications in education, while Muqeeti (2021) found no significant differences in AI use based on certain demographic factors but did observe a correlation between AI use and quality performance in universities. Albasalah et al. (2022) emphasized obstacles in activating AI roles in Saudi universities. Rahiman and Kodikal (2024) confirmed that AI-enhanced assessment methods and Chiu (2024) highlighted the need for AI literacy and innovative teaching in higher education.

## 3. Methods

This study utilized a descriptive and scientific approach that provides an accurate and comprehensive description of the phenomena or topics being studied. This was done either by a descriptive explanation of the case or by using numbers and data to clarify relationships and interactions between phenomena.

The study population involved Education faculty members, and a questionnaire was distributed to 140 respondents to assess their future expectations regarding AI-based learning.

The demographic characteristics (Table 1) of the respondents were as follows: approximately 67.9% were male, while 32.1% were female. Among the respondents, 68.6% belonged to humanities faculties, and 31.4% were from scientific colleges. In terms of experience, 54.3% of the teaching staff had more than ten years of experience, while 45.7% had less. Regarding academic rank, 51.4% were lecturers, followed by 25.7% assistant professors, 12.1% associate professors, and 10.7% professors.

The study used a closed-ended questionnaire deemed appropriate for this research (Table 2). It covered four main areas with a total of 22 items. The first area, consisting of seven items, focused on teaching methods. The second area, with five items, examined communication, while the third area, which also had five items, dealt with technical performance. The fourth area, containing five items, is related to educational activities. Respondents rated their agreement using a five-point Likert scale (Table 3) ranging from "strongly agree" to "strongly disagree."

**Table 1:** Demographic characteristics (N=140)

| | Variables | Total | % | Rank |
|---|---|---|---|---|
| Sex | Male | 95 | 67.9 | 1 |
| | Female | 45 | 32.1 | 2 |
| Colleges | Humanity | 96 | 68.6 | 1 |
| | Science | 44 | 31.4 | 2 |
| Years of experience | < 10 years | 64 | 45.7 | 2 |
| | ≥ 10 years | 76 | 54.3 | 1 |
| Academic rank | Lecturer | 72 | 51.4 | 1 |
| | Assistant professor | 36 | 25.7 | 2 |
| | Associate professor | 17 | 12.1 | 3 |
| | Professor | 15 | 10.7 | 4 |

The validity of the study tool was assessed by converting the questionnaire into an electronic format via Google Docs. Correlation coefficients for each item were statistically significant at the 0.01 level, confirming the tool's validity (Table 4). The tool's reliability was measured (Table 5), showing high-reliability coefficients ranging from 0.843 to 0.860, with an overall reliability coefficient of 0.774.

The stability of the questionnaire was further confirmed using Cronbach's alpha reliability coefficient, which had a minimum value of 0.8825 at a 0.01 significance level. The self-honesty coefficient reached a minimum value of 0.9394, indicating strong stability and validity (Table 6).

The split-half coefficient, based on the Pearson correlation (Pearson, 1895) and Guttman coefficients (Guttman, 1945), confirmed that the questionnaire was being used appropriately, with a Guttman coefficient of 0.93.

Results of the Cronbach's alpha and self-validity tests for individual items showed values consistently above 0.88 for Cronbach's alpha and 0.93 for self-validity, confirming the tool's stability and reliability.

The study followed a set procedure. The questionnaire was electronically distributed, resulting in 140 valid responses, which were reviewed for suitability for analysis. The data was processed using SPSS software. Statistical methods applied included the Pearson Correlation Coefficient, Cronbach's Alpha reliability coefficient, Split-Half Coefficient, mean, standard deviation, independent samples t-test, and one-way ANOVA.

**Table 2:** The questionnaire's dimensions

| Dimensions | No. of phrases |
|---|---|
| The first dimension: Teaching methods | 7 |
| The second dimension: Communication and connection | 5 |
| The third dimension: Technical performance | 5 |
| Fourth dimension: Educational activities | 5 |
| Total | 22 |

**Table 3:** Five-point Likert scale categories

| Category | Category limits | |
|---|---|---|
| Strongly disagree | 1.00 | 1.79 |
| Disagree | 1.80 | 2.59 |
| Neutral | 2.60 | 3.39 |
| Agree | 3.40 | 4.19 |
| Strongly agree | 4.20 | 5.00 |

## 4. Results and discussion

### 4.1. The future expectations of faculty members in light of AI

To address the first question, the researchers calculated frequencies, percentages, arithmetic means, standard deviations, and rankings. According

to the results presented in Table 7, the first dimension, which focused on teaching methods, contained seven statements. The weighted average for this dimension was approximately 4.55, with a standard deviation of about 0.55 and a relative strength of 91%, indicating strong approval of teaching methods. All statements in this dimension received strong agreement ratings. The highest-rated statement was: "Faculty members use educational robots to facilitate the learning process," with a weighted average of about 4.64. This was followed by: "Faculty members use smart educational games to create suspense in the learning process," also with a weighted average of 4.64. The next highest-rated statement was: "Faculty members use expert systems to provide appropriate solutions to learners," with a weighted average of 4.58. This was followed by: "Faculty members use AI applications to diversify teaching methods to meet educational goals," with a weighted average of 4.54. The statement with the lowest score was: "Faculty members use smart assessment applications to highlight learners' strengths and weaknesses," with a weighted average of 4.53, followed by: "Faculty members provide smart adaptive learning to meet learners' needs," with a weighted average of 4.49, and "Faculty members use AI programs that add flexibility to the educational process," with a weighted average of 4.47.

**Table 4:** Results of Pearson correlation coefficients

| No. | The first dimension: Teaching methods | The second dimension: Communication | The third dimension: Technical performance | The fourth dimension: Educational activities |
|---|---|---|---|---|
| 1 | 0.7977** | 0.7951** | 0.7946** | 0.7966** |
| 2 | 0.7997** | 0.7905** | 0.7987** | 0.7971** |
| 3 | 0.8003** | 0.7928** | 0.7965** | 0.7953** |
| 4 | 0.7986** | 0.7919** | 0.8007** | 0.7996** |
| 5 | 0.7897** | 0.7903** | 0.7946** | 0.7994** |
| 6 | 0.7946** | | | |
| 7 | 0.7963** | | | |

**: Significance level at 0.01

**Table 5:** Results of reliability coefficients test

| | No. of dimensions | Cronbach's alpha coefficient |
|---|---|---|
| The first dimension: Teaching methods | 7 | 0.8560 |
| The second dimension: Communication | 5 | 0.8428 |
| The third dimension: Technical performance | 5 | 0.8429 |
| The fourth dimension: Educational activities | 5 | 0.8596 |
| Total | 22 | 0.7742 |

**Table 6:** Results of Cronbach's alpha and self-validity tests

| Phrase | Cronbach's alpha test | Self-validity test |
|---|---|---|
| 1 | 0.8875 | 0.9421 |
| 2 | 0.8887 | 0.9427 |
| 3 | 0.8891 | 0.9429 |
| 4 | 0.8880 | 0.9423 |
| 5 | 0.8825 | 0.9394 |
| 6 | 0.8856 | 0.9410 |
| 7 | 0.8866 | 0.9416 |
| 8 | 0.8859 | 0.9412 |
| 9 | 0.8830 | 0.9397 |
| 10 | 0.8844 | 0.9405 |
| 11 | 0.8839 | 0.9402 |
| 12 | 0.8829 | 0.9396 |
| 13 | 0.8855 | 0.9410 |
| 14 | 0.8881 | 0.9424 |
| 15 | 0.8867 | 0.9416 |
| 16 | 0.8893 | 0.9430 |
| 17 | 0.8855 | 0.9410 |
| 18 | 0.8868 | 0.9417 |
| 19 | 0.8871 | 0.9418 |
| 20 | 0.8860 | 0.9413 |
| 21 | 0.8886 | 0.9427 |
| 22 | 0.8885 | 0.9426 |

The results presented in Table 8 show that the second dimension, which covered communication, included five statements. The weighted average for this dimension was approximately 4.57, with a standard deviation of about 0.59 and a relative strength of 91%, indicating strong agreement with communication-related practices. All statements in this dimension also received strong agreement ratings. The highest-rated statement was: "Faculty members use AI techniques to deliver immediate lessons without requiring direct presence," with a weighted average of 4.61. This was followed by: "Faculty members use audio-making applications to convert text materials into audio files," and "Faculty members use text summarization applications to accurately summarize long texts," both with a weighted average of 4.61. The next highest-rated statement was: "Faculty members employ smart chatbots to respond to learner inquiries," with a weighted average of 4.51. The lowest-rated statement was: "Faculty members use letter recognition and reading applications to convert images into editable text files," with a weighted average of 4.51.

Table 9 presents results for the third dimension, which focuses on technical performance and includes five statements. The weighted average for this dimension was approximately 4.59, with a standard deviation of about 0.51 and a relative strength of 92%, indicating strong agreement. All statements in this dimension were rated as strongly agree. The highest-rated statement was: "Faculty members use natural language processing applications for translation," with a weighted average of 4.67. This was followed by: "Faculty members add an information layer to digital content using augmented reality applications," with a weighted average of 4.61. The next statement was: "Faculty members actively use AI applications in education through web-based training courses," with a weighted average of 4.59, followed by: "Faculty members focus on developing their skills in distance education techniques," with a weighted average of

4.58. The lowest-rated statement was: "Faculty members design courses using AI techniques," with a weighted average of 4.53.

The results presented in Table 10 indicate that the fourth dimension, focused on educational activities, included five statements. The weighted average for this dimension was approximately 4.58, with a standard deviation of about 0.52 and a relative strength of 92%, showing a strong agreement regarding educational activities. All statements in this dimension received strong agreement ratings. The highest-rated statement was: "Faculty members use virtual reality technologies to give learners opportunities to interact with academic content," with a weighted average of about 4.64. This was followed by: "Faculty members use various educational activities across educational platforms," with a weighted average of 4.61. Next was: "Faculty members use AI applications to introduce innovative and modern methods for acquiring both theoretical and practical knowledge," with a weighted average of 4.6, and "Faculty members use AI applications to enhance scientific research capabilities," with a weighted average of 4.54. The lowest-rated statement was: "Faculty members collect articles and resources on using AI in educational technologies to include them in academic courses," with a weighted average of 4.58.

## 4.2. Differences between the responses of the faculty member

### 4.2.1. Gender

To determine whether there were statistically significant differences at the significance level (α = 0.05) between the average responses of faculty members regarding their roles at Yarmouk University in the context of AI-based learning based on gender, an independent samples t-test was conducted. The results shown in Table 11 indicate significant differences between male and female faculty members' average responses on the first dimension, which relates to teaching methods. Similarly, significant differences were found in their responses on the second dimension, which pertains to communication. However, there were no significant differences in average responses on the third dimension, which focuses on technical performance, based on gender. Likewise, no differences were found in average responses on the fourth dimension, which covers educational activities. Overall, the findings indicate statistically significant differences in the total responses of faculty members concerning their roles at Yarmouk University in AI-based learning, based on gender.

### 4.2.2. College

To determine whether there were statistically significant differences at the significance level (α = 0.05) between the average responses of faculty members regarding their future roles at Yarmouk University with AI-based learning based on their college affiliation, an independent samples t-test was conducted. As shown in Table 12, there were significant differences in the average responses of faculty members on the first dimension, which relates to teaching methods, based on college affiliation. However, no significant differences were observed for the second dimension, related to communication. There were significant differences in average responses on the third dimension, which focuses on technical performance, due to college affiliation. No differences were found in average responses on the fourth dimension, concerning educational activities. Overall, statistically significant differences at the significance level (α = 0.05) were found between faculty members' total responses related to their roles at Yarmouk University within the context of AI-based learning based on college affiliation.

### 4.2.3. Experience

To assess whether there were statistically significant differences at the significance level (α = 0.05) between the average responses of faculty members regarding their future roles at Yarmouk University with AI-based learning based on years of experience, an independent samples t-test was used. According to the results shown in Table 13, there were no significant differences in the average responses of faculty members on the first dimension, which pertains to teaching methods, based on years of experience. Similarly, there were no significant differences in their responses on the second dimension, related to communication. However, differences were found in the average responses on the third dimension, which focuses on technical performance, based on years of experience. Additionally, there were differences in average responses on the fourth dimension, concerning educational activities, due to years of experience. Overall, there were no statistically significant differences at the significance level (α = 0.05) in the total average responses of faculty members regarding their future roles at Yarmouk University with AI-based learning, based on years of experience.

### 4.2.4. Academic rank

To reveal the extent to which there are statistically significant differences at the significance level (α = 0.05) between the averages of the responses of faculty members regarding future expectations for the roles of faculty members at Yarmouk University considering learning based on AI according to academic rank, (One way ANOVA Test) was used. Table 14 shows that there are no differences between the averages of the responses of faculty members on the first dimension related to teaching methods due to academic rank.

**Table 7:** The sample members' responses on the first dimension related to teaching methods

| Phrase | Strongly agree | % | Agree | % | Neutral | % | Disagree | % | Strongly disagree | % | Mean | Standard deviation | Total | Weighted percentage | Score | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Faculty use AI software to add flexibility to the educational process | 92 | 65.7 | 34 | 24.3 | 5 | 3.6 | 6 | 4.3 | 3 | 2.1 | 4.47 | 0.92 | 140 | 0.89 | Strongly agree | 7 |
| Faculty members use the educational robot as a teaching tool to facilitate the learning process | 103 | 73.6 | 28 | 20 | 5 | 3.6 | 4 | 2.9 | 0 | 0 | 4.64 | 0.69 | 140 | 0.93 | Strongly agree | 1 |
| Faculty members use the smart assessment applications to highlight the strengths and weaknesses of learners' performance | 94 | 67.1 | 37 | 26.4 | 0 | 0 | 7 | 5 | 2 | 1.4 | 4.53 | 0.85 | 140 | 0.91 | Strongly agree | 5 |
| Faculty provide intelligent adaptive learning to meet learners' educational needs | 92 | 65.7 | 33 | 23.6 | 7 | 5 | 7 | 5 | 1 | 0.7 | 4.49 | 0.86 | 140 | 0.9 | Strongly agree | 6 |
| Faculty use expert systems software to provide appropriate solutions to learners | 104 | 74.3 | 25 | 17.9 | 2 | 1.4 | 6 | 4.3 | 3 | 2.1 | 4.58 | 0.89 | 140 | 0.92 | Strongly agree | 3 |
| Faculty members use smart educational games based on suspense in the educational process | 102 | 72.9 | 29 | 20.7 | 5 | 3.6 | 4 | 2.9 | 0 | 0 | 4.64 | 0.69 | 140 | 0.93 | Strongly agree | 2 |
| Faculty members use AI applications to diversify teaching methods to achieve the goals of the educational process | 96 | 68.6 | 32 | 22.9 | 4 | 2.9 | 7 | 5 | 1 | 0.7 | 4.54 | 0.83 | 140 | 0.91 | Strongly agree | 4 |
| Total dimensions | 683 | 69.7 | 218 | 22.2 | 28 | 2.9 | 41 | 4.2 | 10 | 1 | 4.55 | 0.55 | 980 | 0.91 | Strongly agree | - |

**Table 8:** The sample members' responses on the second dimension related to communication methods

| Phrase | Strongly agree | % | Agree | % | Neutral | % | Disagree | % | Strongly disagree | % | Mean | Standard Deviation | Total | Weighted Percentage | Score | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Faculty members employ smart chatbot to respond to learners' inquiries | 95 | 67.9 | 31 | 22.1 | 6 | 4.3 | 7 | 5.0 | 1 | 0.7 | 4.51 | 0.85 | 140 | 0.90 | Strongly agree | 4 |
| Faculty use audio-making applications to convert written text in course material into audio files | 99 | 70.7 | 34 | 24.3 | 3 | 2.1 | 2 | 1.4 | 2 | 1.4 | 4.61 | 0.74 | 140 | 0.92 | Strongly agree | 2 |
| Faculty use text summarization applications to accurately summarize long texts | 100 | 71.4 | 32 | 22.9 | 3 | 2.1 | 3 | 2.1 | 2 | 1.4 | 4.61 | 0.77 | 140 | 0.92 | Strongly agree | 3 |
| Faculty use character recognition and reading applications to convert images into editable text files | 93 | 66.4 | 36 | 25.7 | 3 | 2.1 | 6 | 4.3 | 2 | 1.4 | 4.51 | 0.85 | 140 | 0.90 | Strongly agree | 5 |
| Faculty use AI technologies to provide real-time lessons to learners without their physical presence | 96 | 68.6 | 38 | 27.1 | 2 | 1.4 | 4 | 2.9 | 0 | 0.0 | 4.61 | 0.66 | 140 | 0.92 | Strongly agree | 1 |
| Total dimensions | 483 | 69.0 | 171 | 24.4 | 17 | 2.4 | 22 | 3.1 | 7 | 1.0 | 4.57 | 0.59 | 700 | 0.91 | Strongly agree | - |

**Table 9:** The sample members' responses on the third dimension related to technical performance

| Phrase | Strongly agree | % | Agree | % | Neutral | % | Disagree | % | Strongly disagree | % | Mean | Standard Deviation | Total | Weighted Percentage | Score | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Faculty members add an information layer in multi-dimensional forms to the digital content of the academic subject using augmented reality applications | 95 | 67.9 | 40 | 28.6 | 1 | 0.7 | 3 | 2.1 | 1 | 0.7 | 4.61 | 0.69 | 140 | 0.92 | Strongly agree | 2 |
| Faculty members use the application of natural language processing in translation operations | 100 | 71.4 | 37 | 26.4 | 0 | 0.0 | 3 | 2.1 | 0 | 0.0 | 4.67 | 0.59 | 140 | 0.93 | Strongly agree | 1 |
| Faculty members employing AI in education by participating in web-based training courses | 98 | 70.0 | 34 | 24.3 | 1 | 0.7 | 6 | 4.3 | 1 | 0.7 | 4.59 | 0.78 | 140 | 0.92 | Strongly agree | 3 |
| Faculty members prepare courses based on employing AI technologies in education | 89 | 63.6 | 43 | 30.7 | 3 | 2.1 | 3 | 2.1 | 2 | 1.4 | 4.53 | 0.77 | 140 | 0.91 | Strongly agree | 5 |
| The teaching member is keen to develop his abilities regarding distance education techniques | 97 | 69.3 | 33 | 23.6 | 5 | 3.6 | 4 | 2.9 | 1 | 0.7 | 4.58 | 0.76 | 140 | 0.92 | Strongly agree | 4 |
| Total dimensions | 479 | 68.4 | 187 | 26.7 | 10 | 1.4 | 19 | 2.7 | 5 | 0.7 | 4.59 | 0.51 | 700 | 0.92 | Strongly agree | - |

**Table 10:** The sample members' responses on the fourth dimension related to educational activities

| Phrase | Strongly agree | % | Agree | % | Neutral | % | Disagree | % | Strongly disagree | % | Mean | Standard Deviation | Total | Weighted Percentage | Score | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Faculty members use AI applications to develop scientific research capabilities | 86 | 61.4 | 48 | 34.3 | 2 | 1.4 | 4 | 2.9 | 0 | 0.0 | 4.54 | 0.67 | 140 | 0.91 | Strongly agree | 4 |
| Faculty use virtual reality technologies to allow learners to interact with the course material | 98 | 70.0 | 37 | 26.4 | 2 | 1.4 | 2 | 1.4 | 1 | 0.7 | 4.64 | 0.66 | 140 | 0.93 | Strongly agree | 1 |
| Faculty members use AI applications to provide discovered and modern methods for acquiring knowledge in both its theoretical and applied aspects | 101 | 72.1 | 29 | 20.7 | 4 | 2.9 | 5 | 3.6 | 1 | 0.7 | 4.60 | 0.78 | 140 | 0.92 | Strongly agree | 3 |
| Faculty collect articles and resources on the use of educational AI technologies for use in courses | 86 | 61.4 | 46 | 32.9 | 3 | 2.1 | 3 | 2.1 | 2 | 1.4 | 4.51 | 0.77 | 140 | 0.90 | Strongly agree | 5 |
| Faculty use various learning activities across educational platforms | 99 | 70.7 | 30 | 21.4 | 9 | 6.4 | 2 | 1.4 | 0 | 0.0 | 4.61 | 0.67 | 140 | 0.92 | Strongly agree | 2 |
| Total dimensions | 470 | 67.1 | 190 | 27.1 | 20 | 2.9 | 16 | 2.3 | 4 | 0.6 | 4.58 | 0.52 | 700 | 0.92 | Strongly agree | - |

**Table 11:** Results of the independent samples t-test between the responses of the faculty members at Yarmouk University according to gender

| Dimensions | T-value | Significance |
|---|---|---|
| The first dimension: Teaching methods | -4.472 | 0.000 |
| The second dimension: Communication | -2.759 | 0.007 |
| The third dimension: Technical performance | -1.448 | 0.150 |
| The fourth dimension: Educational activities | -0.933 | 0.353 |
| Total dimensions | -3.197 | 0.002 |

**Table 12:** Results of the independent samples t-test between the responses of the faculty members at Yarmouk University according to the college

| Dimensions | T-value | Significance |
|---|---|---|
| The first dimension: Teaching methods | 2.956 | 0.004 |
| The second dimension: Communication | 1.547 | 0.124 |
| The third dimension: Technical performance | 2.156 | 0.033 |
| The fourth dimension: Educational activities | 1.794 | 0.075 |
| Total dimensions | 2.757 | 0.007 |

**Table 13:** Results of the independent samples t-test between the responses of the faculty members at Yarmouk University according to the years of experience

| Dimensions | T-value | Significance |
|---|---|---|
| The first dimension: Teaching methods | 0.316 | 0.752 |
| The second dimension: Communication | -1.050 | 0.296 |
| The third dimension: Technical performance | 1.803 | 0.074 |
| The fourth dimension: Educational activities | 2.468 | 0.015 |
| Total dimensions | 1.056 | 0.293 |

There are no differences between the averages of the responses of faculty members on the second dimension related to communication due to academic rank. It was found that there were no differences between the averages of the faculty members' responses on the third dimension related to technical performance due to the academic rank. It was also found that there were no differences between the averages of the faculty members' responses on the fourth dimension related to educational activities due to the academic rank. Statistical significance at the significance level ($\alpha$ = 0.05) between the averages of faculty members' responses to the total sample dimensions related to future expectations for the roles of faculty members at Yarmouk University considering learning based on AI, attributed to academic rank.

**Table 14:** Results of the one-way ANOVA test between the responses of the faculty members at Yarmouk University according to the rank of academic

| Dimensions | T-value | Significance |
|---|---|---|
| The first dimension: Teaching methods | 0.113 | 0.952 |
| The second dimension: Communication | 0.381 | 0.767 |
| The third dimension: Technical performance | 0.417 | 0.741 |
| The fourth dimension: Educational activities | 0.982 | 0.403 |
| Total dimensions | 0.294 | 0.829 |

## 5. Conclusion

This study aligns with many previous works by using a questionnaire as the main tool and employing a descriptive approach along with the social survey method. Both quantitative and qualitative approaches were used to collect and analyze data from respondents, similar to the studies by Al-Muqeeti (2021), Aldosari (2020), Shin and Ghalioun (2023), and Al-Swaihel and Al-Riahi (2024). The findings of this study are consistent with studies like those by Aldosari (2020) and Al-Muqeeti (2021), which examined the use of AI and its impact on university performance. The results emphasized the importance of universities adopting strategies to encourage students and faculty members to use AI in learning and education, providing technical support, and offering training to faculty members on AI concepts and their implications. Holding seminars and training sessions to enhance faculty skills in AI for university education was also highlighted. This study differs from some others in its assessment of faculty members' skill levels concerning AI use in university education, where it was found that respondents showed strong agreement regarding their skills in AI-based learning (Aldosari, 2020; Al-Muqeeti, 2021). Additionally, this study revealed significant differences in responses based on demographic factors, whereas some other studies, such as Chiu (2024), found no significant differences related to demographic variables.

### 5.1. Recommendations

To enhance AI's role in university education, faculty members should prioritize understanding its impact and integration. Seminars and training programs can help improve their AI skills, supported by updated AI-based computer programs. Encouraging AI use in research and adopting strategies to engage students and staff with AI are essential steps. Providing financial and technical resources for faculty training and conducting regular

evaluations of AI usage in teaching will further ensure effective implementation and improvement.

## Acknowledgment

The author extends their gratitude to the Faculty of Education, University of Hail, Saudi Arabia, for their support. Special thanks to the study participants at Yarmouk University whose insights and feedback enhanced this research.

## Compliance with ethical standards

## Ethical considerations

Informed consent was obtained from all participants, and their anonymity and data confidentiality were ensured throughout the study.

## Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## References

Albasalah A, Alshawwa S, and Alarnous R (2022). Use of artificial intelligence in activating the role of Saudi universities in joint scientific research between university teachers and students. PLOS ONE, 17(5): e0267301. https://doi.org/10.1371/journal.pone.0267301 **PMid:35507571 PMCid:PMC9067665**

Aldosari SAM (2020). The future of higher education in the light of artificial intelligence transformations. International Journal of Higher Education, 9(3): 145-151. https://doi.org/10.5430/ijhe.v9n3p145

Almasri F (2024). Exploring the impact of artificial intelligence in teaching and learning of science: A systematic review of empirical research. Research in Science Education, 54: 977-997. https://doi.org/10.1007/s11165-024-10176-3

Chang WY (2019). A data envelopment analysis on the performance of using artificial intelligence-based environmental management systems in the convention and exhibition industry. Ekoloji Dergisi, 28(107): 3515-3521.

Chiu TK (2024). Future research recommendations for transforming higher education with generative AI. Computers and Education: Artificial Intelligence, 6: 100197. https://doi.org/10.1016/j.caeai.2023.100197

Çiftci S, Güneş E, and Üstündağ MT (2010). Attitudes of distance education students towards web based learning–A case study. Procedia-Social and Behavioral Sciences, 2(2): 2393-2396. https://doi.org/10.1016/j.sbspro.2010.03.343

Guttman L (1945). A basis for analyzing test-retest reliability. Psychometrika, 10: 255-282. https://doi.org/10.1007/BF02288892 **PMid:21007983**

Haenlein M, Kaplan A, Tan CW, and Zhang P (2019). Artificial intelligence (AI) and management analytics. Journal of Management Analytics, 6(4): 341-343. https://doi.org/10.1080/23270012.2019.1699876

Kazanidis I and Pellas N (2024). Harnessing generative artificial intelligence for digital literacy innovation: A comparative study between early childhood education and computer science undergraduates. AI, 5(3): 1427-1445. https://doi.org/10.3390/ai5030068

Muqeeti S (2021). The reality of employing artificial intelligence and its relationship to the quality of performance of Jordanian Universities from the faculty's perspectives. M.Sc. Thesis, Middle East University, Amman, Jordan.

Ng DT, Leung JK, Su J, Ng RC, and Chu SK (2023). Teachers' AI digital competencies and twenty-first century skills in the post-pandemic world. Educational Technology Research and Development, 71: 137-161. https://doi.org/10.1007/s11423-023-10203-6 **PMid:36844361 PMCid:PMC9943036**

Ocaña-Fernández Y, Valenzuela-Fernández LA, and Garro-Aburto LL (2019). Artificial intelligence and its implications in higher education. Propositos Y Representaciones, 7(2): 553-568. https://doi.org/10.20511/pyr2019.v7n2.274

Pearson K (1895). VII. Note on regression and inheritance in the case of two parents. Proceedings of the Royal Society of London, 58(347-352): 240-242. https://doi.org/10.1098/rspl.1895.0041

Popenici SA and Kerr S (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. Research and Practice in Technology Enhanced Learning, 12: 22. https://doi.org/10.1186/s41039-017-0062-8 **PMid:30595727 PMCid:PMC6294271**

Rahiman HU and Kodikal R (2024). Revolutionizing education: Artificial intelligence empowered learning in higher education. Cogent Education, 11(1): 2293431. https://doi.org/10.1080/2331186X.2023.2293431

Seo K, Tang J, Roll I, Fels S, and Yoon D (2021). The impact of artificial intelligence on learner–instructor interaction in online learning. International Journal of Educational Technology in Higher Education, 18: 54. https://doi.org/10.1186/s41239-021-00292-9 **PMid:34778540 PMCid:PMC8545464**

WEF (2020). Annual report 2019-2020. World Economic Forum. Available online at: https://www.weforum.org/publications/annual-report-2019-2020/