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Faculty perspectives on generative artificial intelligence: insights into awareness, benefits, concerns, and uses

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Background: The study examined university faculty members' perspectives on Generative Artificial Intelligence (GenAI) tools, focusing on their awareness, perceived benefits, concerns, and uses and applications in education.

Methods: The study employed a cross-sectional descriptive research design in which data were collected using a questionnaire instrument in the summer semester of the 2023/2024 academic year. The number of participants was 102 Kuwaiti faculty members.

Results: The results showed that participant had a moderate awareness of GenAI tools, with some key areas standing out, i.e., their impact on education, ethical implications, and ease of use. Faculty members had positive and high perceptions of the benefits of GenAI tools and their applications in education, particularly in reducing administrative tasks, supporting research, fostering innovation in curriculum design, and enhancing online learning. In addition, results showed that faculty members had a moderate concern regarding GenAI and their application in education. The key problems were related to the contrary effect of GenAI on academic integrity, the potential for plagiarism, over-reliance on these tools, over-dependence on technology, and ethical implications. The participants reported moderate but lower utilization of GenAI tools than their awareness and perceptions. The results revealed significant gender-based differences in participants' awareness, perceived benefits, and utilization of GenAI tools. In contrast, no significant variations were found in faculty members' awareness, perceived benefits, concerns, and utilization levels based on academic rank.

Conclusion: Based on the findings, the study recommended providing professional development programs for faculty members and students and issuing guidelines and policies to ensure the efficient and ethical use of GenAI tools for educational purposes.

KEYWORDS

perspective, GenAI, faculty member, education, Kuwait

1 Introduction

Generative Artificial Intelligence (GenAI) has emerged as a significant force, transforming various domains, including healthcare, education, academic research and publishing, the creative industries, and business operations (Dwivedi, 2025, p. 82). GenAI offers new possibilities for innovation, creativity, and efficiency (Amankwah-Amoah et al., 2024; Gasaymeh et al., 2024). GenAI tools have diverse applications in several fields. For example, in the medical field, GenAI tools can help in providing virtual health assistants, checking symptoms, providing treatment recommendations, providing therapeutic support for patients,

and offering personalized health advice (Javaid et al., 2023; Iftikhar et al., 2023; Garg et al., 2023). In the business field, GenAI tools can help in providing customer service and support, facilitating sales and marketing, facilitating internal communication and collaboration, providing financial analysis, and analyzing customer reviews (George and George, 2023; Waghmare, 2023; Nugroho et al., 2023). In art, GenAI tools can help artists and designers create new pieces of art, music, and design (El Ardeliya et al., 2024).

However, GenAI tools have a particularly growing influence in the education sector. GenAI tools provide diverse services for educators and students. For instance, GenAI tools can help in providing personalized and interactive learning experiences (Pesovski et al., 2024), developing curriculum and educational content (Zhang and Tur, 2024), facilitating students' assessment (Lo, 2023), and providing professional development opportunities for educators (Siminto et al., 2023). GenAI tools have several capabilities that are significant in transforming traditional educational practices that include but are not limited to, creating various formats of educational content, summarizing educational content, translating languages, generating personalized and adaptive educational content, helping in writing and editing, generating natural responses, generating descriptive captions for images, and answering questions about images (Khan, 2023; Al-Shamayleh et al., 2024; Mohamed et al., 2024).

Based on training data, GenAI is a type of artificial intelligence that has been used to create various types of content, that is characterized as being coherent, contextually appropriate, new, and unique; examples of this content include text, audio, video, music, image, multimedia, and art (Anantrasirichai and Bull, 2022). There are several examples of GenAI models. All these models generate content in various formats and using various techniques. In the meantime, transformer models, particularly those based on the Generative Pre-trained Transformer (GPT) architecture, are popular for generating human-like text. They can engage in verbal and written discussions with humans, write essays, answer questions, and carry out conversations.

Several GenAI tools are becoming widely adopted by educators and students for educational purposes. Examples of these tools include OpenAI ChatGPT models, that has been widely used for assisting students with homework, providing educational explanations, generating essays, offering writing prompts, acting as a virtual tutor for various subjects, creating educational material, assisting educators in curriculum development and creating educational content (Adeshola and Adepoju, 2023; Lo, 2023). Other popular examples of GenAI tools are OpenAI DALL-E and Stable Diffusion, which have been used for creating visual content for educational materials, generating illustrations for stories, and designing interactive learning aids (Ibodulla O'gli and Sabapathy, 2024; French et al., 2023). In addition, that have been used for video generation, such as Synthesia and Pictory (Cho et al., 2024), and code generation, such as GitHub Copilot and TabNine (Kapitsaki, 2024). Furthermore, some GenAI tools are popular in creating art and design, such as Artbreeder and DeepArt (Zheng et al., 2024).

Faculty members can use GenAI tools in the teaching process to create lecture notes, presentations, supplementary educational materials, interactive simulations, quizzes, and virtual labs (Aithal and Aithal, 2023). In addition, they can use these tools to offer personal assistance to students (Labadze et al., 2023). GenAI tools can help educators in the evaluation process. For instance, GenAI tools can be used to offer immediate feedback on students' performance

(Chaudhry et al., 2023; Chan and Colloton, 2024), and predict their success (Rasul et al., 2023). In addition, faculty members can use GenAI tools to help them conduct research. For instance, these tools can help develop the literature review (Alshami et al., 2023), generate research questions, and perform advanced data analysis (Aithal and Aithal, 2023). Furthermore, GenAI tools can be used in refining research papers and managing citations (Aithal and Aithal, 2023). In the administrative process, GenAI tools can be used to accomplish several tasks, e.g., to handle routine inquiries from students (Michel-Villarreal et al., 2023) and coordinate departmental activities. Based on the various applications of generative AI in educational settings, alongside ongoing debates about its proper use by students, faculty members must guide their students in the appropriate and ethical use of these tools (Michel-Villarreal et al., 2023). Developing countries are striving to harness the power of integrating Information and Communication Technology (ICT) in education, as evident in the various research studies that examine the adoption and use of various ICT in the educational systems (Gasaymeh, 2018; Gasaymeh and Waswas, 2019; Almisad, 2019; Almisad and Alsalam, 2020; Hussain et al., 2024; Almisad et al., 2024). GenAI is an example of ICT representing powerful tools that might reshape the educational systems worldwide. In line with Kuwait's Vision 2035, the country aims to develop key sectors and promote technological innovation, particularly in artificial intelligence, to keep pace with the global digital transformation. This includes advancements in higher education, where efforts are focused on preparing qualified national cadres capable of addressing future challenges and meeting the evolving demands of the labor market in an increasingly digital world (Al-Husseini, 2023; Alhasan, 2024).

Since GenAI tools are poised to be key players in future educational systems, understanding faculty members' perspectives is crucial for understanding the status and successful future adoption of GenAI tools in higher education. Understanding faculty members' perspectives on GenAI might help in addressing possible concerns, recommending necessary training, informing professional development programs related to GenAI tools, fostering a supportive environment for GenAI tools implementation, evaluating the pedagogical impact of GenAI tools, and providing feedback on how GenAI tools affect teaching methods and students' engagement. In addition, faculty members play integral roles in setting up the ethical guidelines for using GenAI tools in higher education. Therefore, the current study examined university faculty members' perspectives on GenAI tools, focusing on their awareness, perceived benefits, perceived concerns, and uses of these tools and their applications in education.

1.1 Awareness of GenAI among educators in higher education

Individuals' awareness of GenAI tools involves multiple dimensions. A foundational layer of awareness of GenAI is understanding the basic concepts of this technology, such as deep learning, neural networks, and machine learning techniques (Foster, 2019) that represent how GenAI tools create new content through learning patterns from existing data. Besides understanding the basic concepts of GenAI, individuals' awareness of GenAI involves understanding how GenAI models operate. A prominent example of GenAI is ChatGPT, which operates based on deep learning, particularly

transformer neural networks, to create bodies of writing that are like human writing. The process includes data preparation and transformer-based model training (Roumeliotis and Tselikas, 2023; Gupta et al., 2024). The other phases are input processing; context understanding; text generation; and sequence generation; decoding, and output processing (Roumeliotis and Tselikas, 2023; Gupta et al., 2024).

Educators' awareness includes knowing GenAI's teaching and research applications. In higher education settings, awareness includes recognizing GenAI's potential for content development, including its ability to assist in curriculum design and instructional material creation (Michel-Villarreal et al., 2023; Chan and Colloton, 2024). In addition, educators' awareness also includes understanding the potential research-related functionalities of GenAI (Aithal and Aithal, 2023; Alshami et al., 2023). However, awareness of GenAI tools should involve understanding ethical implications and challenges associated with these tools in educational settings, such as issues related to bias and fairness (Eckert, 2024), academic integrity (Michel-Villarreal et al., 2023), privacy and data security (Gupta et al., 2023), transparency of use (Camacho-Zuñiga et al., 2024), and content quality.

Educators' awareness of GenAI tools involves their beliefs about the significant potential impact of these tools on the teaching and learning process. For example, educators' awareness of GenAI includes understanding its potential to enhance student engagement and personalize learning experiences. This awareness extends to recognizing how GenAI tools can be applied in educational settings to automate content creation, promote and streamline administrative tasks (Michel-Villarreal et al., 2023; Chan and Colloton, 2024). In the educational environment, discussions among educators about the implications and applications of GenAI in the educational setting represent an indication of their awareness of these tools, where such conversations would facilitate knowledge sharing, identify opportunities, and promote critical thinking about the GenAI's capabilities and limitations in the educational settings (Al-Mughairi and Bhaskar, 2024). Educators' confidence in using GenAI tools reflects their awareness of the technology, when they believe that they can master using and employing GenAI tools, they are more likely to invest time and effort into learning about them (Wang et al., 2021). In addition, high self-efficacy regarding using GenAI might increase their engagement with such technology, reduce resistance to using this technology, encourage continuous learning about this technology, and enable taking the right decision regarding employing GenAI tools in their educational practice (Wang et al., 2021).

1.2 Potential benefits of the use of GenAI in higher education

There are several possible benefits of using GenAI tools in education. Using GenAI tools in education would increase student engagement in different ways (Meli et al., 2024). For example, GenAI can facilitate educational role-playing scenarios (Salinas-Navarro et al., 2024). In addition, GenAI tools can be used to increase student engagement through facilitating virtual labs (Borah et al., 2024), adaptive quizzing (Klein and Kovacs, 2024), scenario-based learning (Bai et al., 2024), and engaging discussions. Furthermore, GenAI tools would help enable personalized learning experiences for students (Bdoor and Habes, 2024; Graefen and

Fazal, 2024; Leelavathi and Surendhranatha, 2024). Furthermore, GenAI tools have been used to develop 21st-century skills for university students that are necessary for the future workforce (Chiu, 2023).

GenAI tools can save faculty time by handling grading, feedback, and administrative tasks (Michel-Villarreal et al., 2023). In addition, GenAI tools can provide faculty members with valuable help in conducting research, where they can be used in analyzing qualitative and quantitative data and writing literature reviews (Aithal and Aithal, 2023). Furthermore, in the teaching process, GenAI tools can help faculty members design and deliver curriculum and educational content (Adeshola and Adepoju, 2023; Lo, 2023). GenAI tools support the design and delivery of blended and online courses (Nikolopoulou, 2024).

1.3 Potential concerns regarding the use of GenAI in higher education

Using GenAI tools in higher education environments might raise several concerns. One concern is the quality and accuracy of GenAI content, which may be inconsistent, biased, or outdated (Pathak, 2023). Another possible concern is the financial costs of implementing and maintaining GenAI tools in higher education systems.

Faculty members have a common concern regarding the implementation of GenAI in education that the students may become overly reliant on these tools for their assignments and learning due to several factors, i.e., ease of accessing these tools, high quality of generated content from these tools, and students' lack of confidence (Sharma and Yadav, 2022). Students' over-reliance on these tools might cause academic problems such as hindering skills development, reducing creativity, and decreasing critical thinking (Yuan et al., 2024). Students' reliance on GenAI tools may compromise academic integrity by enabling plagiarism, cheating, and data fabrication in research, writing, exams, and group work (Mahmud, 2024). Furthermore, using GenAI tools in educational settings might cause over-dependence issues among educators too (Holmes, 2023). In addition, faculty members' reliance on GenAI tools might undermine traditional teaching practices and the roles of educators. In addition, the widespread use of different forms of electronic learning driven by GenAI in educational institutions might raise concerns about job security for educators (Meniado, 2023).

1.4 Uses of GenAI in higher education

Building on the preceding discussion of educators' awareness and perceptions of GenAI tools, this section illustrates how that awareness is translated into practical applications within higher education. It presents specific examples of how faculty members utilize GenAI technologies to enhance teaching, students' learning, and research activities. Faculty members can use GenAI tools to create various types of educational content (Lo, 2023). Furthermore, GenAI tools can help educators develop curriculum materials (Zhang and Tur, 2024).

GenAI tools can facilitate discussions among students and between students and their instructors (Lin et al., 2024). Furthermore, GenAI tools can be incorporated into lectures to help answer students' questions and provide additional explanations on complex topics

(Labadze et al., 2023). In the context of teaching, faculty members can use GenAI tools to facilitate academic joint projects with other colleagues (Al-Zahrani, 2023).

Beyond in-class support, GenAI tools can also aid student learning outside the classroom. For instance, instructors can design assignments that encourage students to use GenAI tools to get through these assignments (McGuire et al., 2024). In addition, students can use GenAI tools to support their understanding by clarifying concepts (Karthikeyan, 2023). Students can use GenAI tools to practice problems with instant feedback and to support their writing (Karthikeyan, 2023). GenAI tools play an increasing role in evaluating the process of students' learning. For instance, educators can employ GenAI tools to provide feedback on students' work (Lo, 2023).

Educators can also use GenAI writing tools in their research activities. GenAI writing tools can be for educators in their research activities (Alshami et al., 2023; Aithal and Aithal, 2023). GenAI writing tools can help educators draft professional emails and generate administrative documents (Michel-Villarreal et al., 2023; Chan and Colloton, 2024).

2 Previous studies

The literature review shows that previous studies examined educators' perceptions of and uses of GenAI writing tools. For instance, in the Philippines, Goli-Cruz (2024) examined university faculty members' perceptions of the use of a GenAI writing tool, i.e., ChatGPT, in education. The research followed a qualitative research approach in which 20 faculty members were interviewed. The results showed ChatGPT's positive and negative impacts on higher education. For instance, the participants believed that ChatGPT could be a helpful learning tool in encouraging shy students to learn and cultivating students' ability to think critically and independently. In addition, the participants believed that ChatGPT can help streamline repetitive tasks for educators. On the other side, the participants believed that using ChatGPT in education might hinder students' critical thinking abilities and lead to an over-reliance on technology.

In another study that was conducted in Oman, Al-Mughairi and Bhaskar (2024) examined university educators' perspectives of GenAI writing tools in higher education in terms of the factors that would affect their adoption of such tools, focusing on ChatGPT. The study followed a qualitative research design in which 34 educators conducted in-depth interviews. The results showed that participants' primary motives for adopting ChatGPT were exploring innovative education technologies, facilitating personalized teaching and learning, saving time, and contributing to their professional development. However, participants reported some concerns regarding the adoption of ChatGPT related to the generated content's reliability and accuracy, reduced human interaction, privacy and data security, lack of institutional support, and overreliance issues.

In Bulgaria, Kiryakova and Angelova (2023) examined university faculty members' perceptions of using the GenAI writing tool, i.e., ChatGPT, in teaching. The study followed a cross-sectional descriptive research design in which 87 faculty members completed an online questionnaire. The results showed that the participants had an overall positive attitude regarding implementing ChatGPT in their teaching practice. They believed that using ChatGPT Boosts engagement,

creativity, and efficiency. However, the participants reported some concerns regarding the use of ChatGPT in education, including the unethical use of ChatGPT. In another interesting research conducted in the United States, Mamo et al. (2024) conducted a study that aimed to understand faculty attitudes toward the GenAI writing tool, i.e., ChatGPT. The research involved analyzing the sentiments of a set of tweets that included the hashtags “#ChatGPT” and “#highered” over about six months. The results showed that 40% of the sentiments expressed were positive, 51% were neutral, and 9% were negative.

In Korea, Jiyoung et al. (2024) examined faculty members' perceptions and usage of the GenAI writing tool, i.e., ChatGPT. The research followed a descriptive design in which 341 faculty members completed a survey. The results indicated that participants had prior experience using ChatGPT for personal purposes, including information searches and satisfying curiosity. However, they used it less for teaching purposes. The participants believed that ChatGPT was a valuable tool in education for translation and summarization services. However, they reported concerns about the spread of disinformation associated with using such technology.

In Pakistan, Malik (2024) investigated faculty members' perceptions about using the GenAI writing tool, i.e., ChatGPT, in higher education regarding perceived challenges and opportunities. The study followed a qualitative design in which eight faculty members participated in semi-structured interviews. The results showed that only half of the participants were active users of such technology. The participants reported several benefits of using ChatGPT, including the capability of ChatGPT to generate human-like text, give feedback on work, develop assessment and evaluation activities, find answers to queries, assist in research activities, and save time by doing routine administrative work. However, the participants reported some challenges related to the use of ChatGPT in education, such as the negative adverse effect of such technology on students' writing skills through overreliance on it and its contributions to plagiarism and academic fraud. In another study in Indonesia, Firaina and Sulisworo (2023) examined lecturers' views and the rationality of lecturers in using the GenAI writing tool, i.e., ChatGPT, for academic purposes. The study followed a qualitative research design in which five university lecturers participated. The results showed that the participants reported using ChatGPT to find information, translate text, and deepen their understanding of some educational topics. However, the participants reported some issues related to the use of ChatGPT in education regarding the reliability and accuracy of the generated AI content.

In another study in the United States, Amani et al. (2023) examined faculty members' and academic staff' perceptions of using GenAI tools in academia. The study focused on ChatGPT as an example of a GenAI tool. The study followed a descriptive research design in which 243 faculty and staff completed a survey. The results showed that 64% of faculty/staff have an account and have used ChatGPT. The participants reported using these tools to ask technical questions, ask general knowledge questions, and carry on a conversation out of curiosity. In addition, the results showed that about half of the faculty members and academic staff felt comfortable with their students using ChatGPT. The participants stressed the benefits of ChatGPT in facilitating personalized learning and providing effective and instant feedback. However, the faculty members and academic staff believed that ChatGPT raised some concerns related to academic dishonesty and students' critical

thinking and problem-solving skills. In another study, Black (2024) conducted a study that aimed to examine faculty members' adoption of GenAI. The research followed a descriptive design in which 214 faculty members completed a questionnaire. The results showed that most participants were identified as adopters of GenAI tools.

Some of these studies focused on the faculty members' perceptions and uses of GenAI writing tools in specific majors. For example, Elsaadany (2024) examined faculty members' perspectives of a specific GenAI writing tool, i.e., ChatGPT, in English as a Foreign Language (EFL) Classrooms. The research followed a descriptive research design in which 36 faculty members completed a questionnaire instrument. The results showed that most EFL professors had a negative perception regarding using ChatGPT in EFL teaching and learning in higher education. Their concerns were related to plagiarism and students' overreliance on chatbots. However, some participants recognized the positive aspects ChatGPT can offer, e.g., creating educational materials and resources, enhancing students' motivation, and saving their time. In addition, the results showed that participants' perceptions of using ChatGPT did not differ based on their gender.

The examined literature shows multiple studies examining educators' and academic staff's perceptions and uses of GenAI tools, focusing on the famous tool, i.e., ChatGPT, in higher education. These studies employed qualitative and quantitative research designs. The examined studies use several data collection tools, including interviews, surveys, and sentiment analysis. The results showed a mix of positive and negative perceptions. On the positive side, participants acknowledged the benefits of GenAI tools in saving time, enhancing personalized learning, fostering students' engagement, and assisting in routine academic tasks. However, significant concerns were raised regarding the potential over-reliance on technology, the risk of undermining students' critical thinking skills, issues of academic integrity such as plagiarism, and the reliability of AI-generated content. Some examined studies also highlighted the ethical implications of using GenAI tools in education.

The existing literature indicates various statuses in which GenAI tools like ChatGPT were used in higher education, offering significant benefits and presenting challenges for faculty members. Given these mixed perceptions and the use of GenAI tools, there is a need to understand faculty members' perspectives on GenAI tools in a specific cultural context. In addition, given the lack of studies that focused on the multiple dimensions of faculty members' perspectives regarding the use of GenAI in higher education, previous studies focused on the general perception and use of GenAI in higher education among faculty members. There is a lack of studies that have comprehensively addressed multiple dimensions of faculty perspectives—such as awareness, perceived benefits, concerns, and actual usage—regarding GenAI in higher education, particularly in the context of the Arab world. The study examined Kuwaiti university faculty members' perspectives on GenAI tools, focusing on their awareness, perceived benefits, concerns, and uses of these tools and their applications in education.

This research is expected to provide insights to inform the development of tailored strategies for integrating GenAI tools. In addition, the results are expected to help educators and policymakers consider the benefits while addressing the concerns associated with the use of GenAI tools in higher education. The findings of the current study might help ensure that using GenAI tools not only improves educational outcomes and enriches students' learning experiences but can also support academic integrity in various ways.

3 Research method

This study used a cross-sectional descriptive research design to examine Kuwaiti faculty members' perspectives on GenAI tools. The participants were asked to complete a questionnaire. The following sections outline the research questions, participants, data collection tool, the study settings and procedure, and the data analysis process.

3.1 Research questions

The current research has the following research questions that guide the investigation of Kuwaiti university faculty members' perspective on GenAI tools in terms of their awareness, perceived benefits, perceived associated concerns, and use of these tools in higher education:

- 1 What is the level of awareness among faculty members regarding the GenAI tools and their applications in education?
- 2 What are faculty members' perceptions of the benefits of applying GenAI tools in education?
- 3 What are faculty members' concerns regarding the applications of GenAI tools in education?
- 4 What is the level of utilization of GenAI tools by faculty members in education?
- 5 How do the levels of awareness, perceived benefits, perceived concerns, and utilization of GenAI tools in education differ among faculty members based on gender and academic rank?

3.2 Participants

The participants in the current study were a group of faculty members from two universities in Kuwait. Based on their gender, the participants in the current study demonstrate a balanced distribution. The representative sample of males and females helps examine gender-related differences in faculty members' perspectives on GenAI tools in higher education.

The participants' ages varied, with most between 40 and 57 and fewer in younger or older age groups. Like the broad age range, participants varied in their years of experience in higher education, including both early-career and late-career faculty. Participants varied in academic rank, with representation across lecturers, assistants, associates, and full professors. This distribution reflects a balanced mix of seniority, aligning with participants' age and experience levels.

Finally, regarding the faculty of the participants, about half (49%; $n = 50$) were from the College of Education, while the rest came from other faculties. Such distribution allows us to focus on educational fields while still maintaining some cross-disciplinary perspectives. The large number of participants from the College of Education might be because many of them know the researchers, which motivates them to complete the questionnaire. Table 1 shows a descriptive summary of participants' demographic data.

3.3 Data collection tool

The data collection tool was a questionnaire. The questionnaire consisted of five sections. The first section consisted of questions

TABLE 1 Descriptive summary of participants’ demographic data.

Variable	Category	Frequency	Percent
Gender	Female	52	51
	Male	50	49
Age	34–39	5	4.9
	40–45	26	25.5
	46–51	16	15.7
	51–57	27	26.5
	58–63	12	11.8
	More than 63	16	15.7
Years of teaching experience	01-Oct	35	34.3
	Nov-20	28	27.5
	21–30	24	23.5
	More than 30	15	14.7
Academic rank	Lecturer	36	35.3
	Assistant Professor	19	18.6
	Associate Professor	24	23.5
	Full Professor	23	22.5
Faculty	Education	50	49
	Other	52	51

regarding participants’ gender, age, academic rank, faculty, and experience in academic work. The second section consists of items that examine faculty members’ awareness of GenAI tools and their applications in education. The number of items in this section is 8. These items were adopted from examined literature (Foster, 2019; Roumeliotis and Tselikas, 2023; Gupta et al., 2024; Michel-Villarreal et al., 2023; Chan and Colloton, 2024; Aithal and Aithal, 2023; Alshami et al., 2023; Eckert, 2024; Gupta et al., 2023; Al-Mughairi and Bhaskar, 2024; Wang et al., 2021). The third section consists of items that examine faculty members’ perceptions of the benefits of applying GenAI tools in education. The number of items in this section is 8. These items were adopted from examined literature (Meli et al., 2024; Salinas-Navarro et al., 2024; Borah et al., 2024; Klein and Kovacs, 2024; Bai et al., 2024; Bdoor and Habes, 2024; Graefen and Fazal, 2024; Leelavathi and Surendhranatha, 2024; Chiu, 2023; Michel-Villarreal et al., 2023; Aithal and Aithal, 2023; Adeshola and Adepoju, 2023; Lo, 2023; Nikolopoulou, 2024). The fourth section consists of items that examine faculty members’ concerns regarding GenAI tools and their applications in education. The number of items in this section is 8. These items were adopted from examined literature (Pathak, 2023; Sharma and Yadav, 2022; Yuan et al., 2024; Holmes, 2023; Meniado, 2023). The fifth section consists of items that examine faculty members’ level of utilizing GenAI tools in education. The number of items in this section is 9. These items were adopted from examined literature (Lo, 2023; Zhang and Tur, 2024; Lin et al., 2024; Labadze et al., 2023; Al-Zahrani, 2023; McGuire et al., 2024; Karthikeyan, 2023; Alshami et al., 2023; Aithal and Aithal, 2023; Michel-Villarreal et al., 2023; Chan and Colloton, 2024).

In the second, third, fourth, and fifth sections, the participants were asked to select one response option from a five-point Likert scale:

TABLE 2 A summary of the reliability analysis (N = 102).

Scale	Number of Scale Items	Cronbach’s Alpha
Awareness scale	8	0.88
Benefits scale	8	0.93
Concerns scale	8	0.88
Use scale	9	0.92

“Strongly Disagree,” “Disagree,” “Neutral,” “Agree,” and “Strongly Agree.” Each level of agreement corresponded to a specific numerical value ranging from 1 to 5, respectively.

The face validity of the questionnaire was verified by presenting its first draft to a panel of experts with various expertise in the field of education. Cronbach’s Alpha was used to indicate the reliability of each scale in the questionnaire instrument. The Cronbach’s Alpha values ranged from 0.88 to 0.92, and the values of Cronbach’s Alpha are greater than 0.8, indicating “good” internal consistency of the items in the scales (Aron et al., 2005). This suggests that the items within each scale were highly correlated and likely measured the same construct. A summary of the reliability analysis is provided in Table 2.

3.4 Study settings and procedure

The study was conducted in the summer semester of the 2024/2025 academic year. The participants were invited to participate in the current study using online invitation letters and consent forms sent to faculty members via electronic groups. Participation in the study was entirely voluntary. To protect the confidentiality and anonymity of participants, they were informed that their responses would be anonymized, with no identifying information connected to their data. The questionnaire was designed to avoid collecting any information that could reveal participants’ identities. Before participating, respondents were presented with an informed consent form outlining the study’s purpose, how the data would be used, and assurances of confidentiality. The data was securely stored on password-protected servers, accessible only to the researcher. Clear instructions were provided to participants on completing the questionnaire to minimize any potential misunderstandings, and all questions were made mandatory to ensure complete responses.

3.5 Data analysis process

Descriptive analyses were used to answer the first four research questions regarding faculty members’ awareness, perceived benefits, perceived concerns, and use of GenAI tools in education. The descriptive analysis involves determining the mean, standard deviation, and level for each question in the questionnaire and the mean, standard deviation, and level for each dimension.

To qualitatively describe faculty members’ responses to the questionnaire’s items, the current research employs the following criteria to categorize responses on a five-point Likert scale: a mean of 3.67 or higher is classified as “High,” a mean between 2.34 and 3.66 is

considered “Moderate,” and a mean below 2.34 is designated as “Low.” This classification method has been adopted from prior studies.

Different forms of statistical tests were employed to answer the fifth question, including t-tests and analysis of variance (ANOVA) tests. Independent sample t-tests were conducted to examine the differences in faculty members’ awareness, perceived benefits, perceived concerns, and utilization of GenAI tools in education based on their gender. Analysis of variance (ANOVA) was conducted to examine variations in faculty members’ awareness, perceived benefits, perceived concerns, and utilization of GenAI tools in education based on their academic rank.

4 Results and discussion

4.1 First research question: what is the level of awareness among faculty members regarding the GenAI tools and their applications in education?

The findings regarding faculty members’ awareness of GenAI tools and their applications in education suggest that they had a moderate level of awareness of these applications. Table 3 shows the means, standard deviations, and levels of faculty members’ responses regarding their awareness of GenAI tools.

The faculty members’ overall awareness of GenAI tools and their applications in education was moderate ($M = 3.39$, $SD = 0.90$). There is a strong agreement among faculty members about the current and future impact of GenAI tools on education, as reflected in their positive response to the first statement “I believe GenAI has the potential to impact education significantly” ($M = 4.17$, $SD = 1.03$). In addition, faculty members had a high level of awareness of ethical implications and challenges associated with the use of GenAI tools in education reflected in the high mean score of their response to item 2, “I am aware of the ethical implications and challenges associated with GenAI such as bias, academic integrity, privacy and data security, and content quality.” ($M = 3.69$, $SD = 1.30$). Similarly, the participants had

positive feelings regarding their ability to learn and use GenAI tools, reflected in the moderate mean score of their response to item 3, “I feel confident in my ability to learn about and use GenAI technologies” ($M = 3.62$, $SD = 1.23$).

Faculty members disagreed that they know how GenAI models like ChatGPT operate; they responded least positively to item 8, “I understand how GenAI models like ChatGPT operate, starting from the training phase to the generation phase.” ($M = 2.97$, $SD = 1.19$). Similarly, faculty members disagreed that they have the knowledge about the technical concepts associated with GenAI tools, e.g., deep learning, neural networks, and machine learning, reflected in their close to neutral response to item 6, “I am familiar with basic concepts of GenAI, such as deep learning, neural networks, and machine learning.” ($M = 3.08$, $SD = 1.12$). Another item with a neutral score was item 7, “I have used GenAI tools, such as ChatGPT, in my teaching or research.” ($M = 3.00$, $SD = 1.40$).

Faculty members’ responses to the awareness scale showed that they were in the process of getting familiar with and building knowledge about the GenAI tools and their applications in education by looking for more information about GenAI, where the participants agreed to some extent on item 4, “I actively seek out new information and resources to stay updated on advancements in GenAI.” ($M = 3.49$, $SD = 1.23$). However, they did not similarly agree that they engage in discussion with their colleagues to know more about GenAI tools and their applications in education, where the participants’ responses to item 5 were close to neutral, “I engage in discussions with colleagues about the implications and applications of GenAI.” ($M = 3.12$, $SD = 1.20$).

Faculty members’ moderate awareness of GenAI tools and their applications in education might be attributed to several reasons, including a lack of formal training about them and their applications in higher education and limited actual experiences using these tools. In addition, the participants appear to be influenced by mass media propaganda concerning the ethical implications of AI.

Faculty members’ responses to the first item in the awareness scale suggest that the effect of GenAI tools on education is inevitable. The overall moderate score suggests the faculty members were in a

TABLE 3 Means and standard deviations of faculty members’ responses regarding their level of awareness of GenAI tools ($N = 102$).

N	Awareness of GenAI tools	M	SD	Level
1	I believe GenAI has the potential to significantly impact education.	4.17	1.03	High
2	I am aware of the ethical implications and challenges associated with GenAI such as bias, academic integrity, privacy and data security, and content quality.	3.69	1.30	High
3	I feel confident in my ability to learn about and use GenAI technologies.	3.62	1.23	Moderate
4	I actively seek out new information and resources to stay updated on advancements in GenAI.	3.49	1.23	Moderate
5	I engage in discussions with colleagues about the implications and applications of GenAI.	3.12	1.20	Moderate
6	I am familiar with the basic concepts of GenAI, such as deep learning, neural networks, and machine learning.	3.08	1.12	Moderate
7	I have used GenAI tools, such as ChatGPT, in my teaching or research.	3.00	1.40	Moderate
8	I understand how GenAI models like ChatGPT operate starting from the training phase to the generation phase.	2.97	1.19	Moderate
	Total	3.39	0.90	Moderate

1 = ‘Strongly Disagree’, 2 = ‘Disagree’, 3 = ‘Neutral’, 4 = ‘Agree’, 5 = ‘Strongly Agree’.

TABLE 4 Means and standard deviations of faculty members' responses regarding their perceptions of the benefits of applying GenAI tools ($N = 102$).

<i>N</i>	Benefits of GenAI tools	<i>M</i>	<i>SD</i>	Level
1	GenAI can help reduce the time spent on administrative tasks, allowing more focus on teaching and research.	3.95	1.10	High
2	The integration of GenAI fosters innovation in curriculum design and delivery.	3.94	1.02	High
3	GenAI provides valuable support for faculty research activities, such as data analysis and literature reviews.	3.92	1.05	High
4	GenAI tools are particularly beneficial for enhancing the quality and delivery of online learning.	3.88	1.09	High
5	The use of GenAI in the classroom increases student engagement.	3.67	1.06	High
6	GenAI tools, like ChatGPT, enhance the learning experience for students.	3.66	1.06	Moderate
7	Using GenAI in higher education better prepares students for the demands of the future workforce.	3.64	1.20	Moderate
8	GenAI enables more personalized learning experiences for students.	3.52	1.10	Moderate
	Total	3.77	0.90	High

1 = 'Strongly Disagree'; 2 = 'Disagree'; 3 = 'Neutral'; 4 = 'Agree'; 5 = 'Strongly Agree'.

transitional phase and gradually increased their familiarity with these tools. The findings suggest the participants were optimistic about GenAI tools' transformative potential in education. In addition, they were optimistic about the future impact of GenAI tools on higher education. However, the participants' knowledge of the technical aspects of GenAI is still limited. Even though the participants reported high self-efficacy when learning about the GenAI tools.

The study's results concerning the moderate level of awareness of GenAI tools and their applications in education indicate the need to improve faculty members' awareness and their application in higher education. For instance, faculty members' high ethical awareness of these tools should be reinforced through discussions on issues related to GenAI such as bias, privacy, and integrity, both at the institutional and national levels. The results showed a critical gap between faculty members' recognition of GenAI's transformative potential and their understanding of its operational foundations. This gap suggests that without deep understanding, faculty members might underutilize these tools or misguide students in their responsible use. Furthermore, at the institutional level, the findings suggest university administrators should provide faculty members with structured awareness programs about focus on technical fluency. These structured awareness programs can be in the form of workshops, sandbox environments, and guided experimentation.

These findings aligned with previous studies that showed that some faculty members were familiar with the use of GenAI tools reflected in their experience with these tools. For instance, (Malik's 92,024) study found that half of the participants were active users of GenAI tools like ChatGPT, and Amani et al.'s (2023) study showed that 64% of faculty and staff had an account and had used GenAI tools like ChatGPT. However, there is a lack of similar studies that directly examined faculty members' awareness of GenAI tools and the various dimensions of awareness of such tools.

4.2 Second research question: what are faculty members' perceptions of the benefits of applying GenAI tools in education?

The findings regarding faculty members' perceptions of the benefits of applying GenAI tools in education suggest that they had

highly positive perceptions of these benefits. Table 4 shows the means, standard deviations, and levels of faculty members' responses regarding their perceptions of the benefits of applying GenAI tools.

The faculty members' overall perceptions of the benefits of applying GenAI tools in educational practices were at a high level ($M = 3.77$, $SD = 0.90$), with most of the benefits rated at a high level. Faculty members believed that one of the main benefits of GenAI is to help in administrative tasks; they were found to have responded most positively to item 1, "GenAI can help reduce the time spent on administrative tasks, allowing more focus on teaching and research" ($M = 3.95$, $SD = 1.10$). Another closely rated benefit was the one related to the roles of GenAI tools in curriculum development reflected in the high mean score of their response to item 2, "The integration of GenAI fosters innovation in curriculum design and delivery." ($M = 3.94$, $SD = 1.02$). The benefits of GenAI tools in facilitating research and online learning were rated equally high by the faculty members, reflected in the mean score of their response to item 3, "GenAI provides valuable support for faculty research activities, such as data analysis and literature reviews." ($M = 3.92$, $SD = 1.05$) and item 4, "GenAI tools are particularly beneficial for enhancing the quality and delivery of online learning." ($M = 3.88$, $SD = 1.09$).

The faculty members responded less enthusiastically regarding the benefits of GenAI tools in education when it comes to the use of these tools with students. The benefits of the use of GenAI tools in classroom and to enhance students' learning were rated almost equally by the faculty members, reflected in the high-level mean score of their response to item 5, "The use of GenAI in the classroom increases student engagement." ($M = 3.67$, $SD = 1.06$) and the moderate level mean score of their response to item 6 "Using GenAI in higher education better prepares students for the demands of the future workforce." ($M = 3.66$, $SD = 1.06$).

Faculty members' perceptions of the benefit related to the role of GenAI tools' potential to tailor educational experiences to each student's needs did not match the other level benefits; they responded least positively to item 8, "GenAI enables more personalized learning experiences for students" ($M = 3.52$, $SD = 1.10$). Similarly, faculty members moderate level of perception of the benefit related to the role of GenAI tools to prepare students for the demands of the future workforce reflected in their response to item 7, "Using GenAI in higher education better prepares students for the demands of the future workforce." ($M = 3.64$, $SD = 1.20$).

Faculty members' high overall perception of the benefits of GenAI tools might be attributed to several reasons that include saving their time and efforts, particularly in reducing administrative tasks and paperwork that might distract them from their core academic responsibilities, i.e., teaching and research. In addition, conducting research requires a range of tasks that vary in intellectual demand; therefore, GenAI tools can help in accomplishing some low-order research tasks, e.g., conducting literature reviews, allowing faculty members to focus on higher-order research tasks. Given the increasing demand for online education worldwide, particularly in the last few years with the appearance of the COVID-19 pandemic (Ashour, 2024), faculty members believe GenAI tools can help facilitate high-quality online education. In addition, faculty members usually seek to enhance student engagement (Barkley and Major, 2020), and they believe that GenAI tools can assist in creating more dynamic learning materials. However, the faculty was more cautious about GenAI tools' direct benefits for students. A possible explanation might be their belief that while they can responsibly use these tools, students might misuse them. This could lead to over-reliance on GenAI tools, affecting academic integrity and hindering students' learning.

The high overall score suggests that faculty members are confident in GenAI tools' benefits for accomplishing administrative tasks, developing innovation in curriculum design, facilitating research, and improving online learning.

Faculty members' cautiousness about the direct benefits for students suggests that they still hesitate to fully integrate these tools into students' educational activities. These results indicate the need to improve GenAI tools' applications in higher education by offering training for faculty members to improve administrative efficiency and curriculum design. In addition, training should address the role of GenAI tools in supporting research and enhancing online learning. Furthermore, students should be offered literacy courses about the proper uses of GenAI tools. Institutions should set GenAI use guidelines. Therefore, higher education must also address the perceived boundary between GenAI as a professional tool and a student learning aid by framing GenAI as a replacement and a scaffold for student-centered learning. In addition, policies should clarify the responsible use of GenAI.

These findings regarding the highly perceived benefits of GenAI tools in accomplishing administrative tasks in traditional and online education and helping with research are aligned with Malik's (2024) study.

4.3 Third research question: what are faculty members' concerns regarding the applications of GenAI tools in education?

The findings regarding faculty members' perceptions of the concerns associated with applying GenAI tools in education suggest they had a moderate level of concerns about applying these tools. Table 5 shows the means, standard deviations, and levels of faculty members' responses regarding their concerns regarding the applications of GenAI tools in education.

The faculty members' overall concerns regarding the applications of GenAI tools in education were moderate ($M = 3.549$, $SD = 0.84$), with four of the concerns rated high. Faculty members believed that one of the main concerns of GenAI is related to the effect of GenAI tools on academic integrity and the potential for plagiarism, they were found to have responded most positively to item 1 "The use of GenAI raises concerns about academic integrity and the potential for plagiarism." ($M = 3.99$, $SD = 1.16$). Another closely rated concern was the one related to students' overly reliant on GenAI tools and overdependence on technology reflected in the high mean score of their response to item 2 "I am concerned that students may become overly reliant on GenAI tools for their assignments and learning." ($M = 3.85$, $SD = 1.22$). Furthermore, item 3, "The increasing use of GenAI in education could lead to an over-dependence on technology." ($M = 3.81$, $SD = 1.14$). Another concern rated at a high level was related to the ethical implications of GenAI in higher education, presented in item 4, "I am concerned about the ethical implications of using GenAI in higher education." ($M = 3.74$, $SD = 1.08$).

Faculty members' responses to the scale of the concerns showed that had a moderate level of concerns regarding the effect of GenAI tools on traditional teaching and the role of educators as well as the threat of GenAI tools on their jobs as educators, where the participants moderately agreed on item 5, "I worry that GenAI might undermine traditional teaching practices and the role of educators." ($M = 3.23$,

TABLE 5 Means and standard deviations of faculty members' responses regarding faculty members' concerns regarding the applications of GenAI tools in education ($N = 102$).

N	Concerns regarding GenAI tools	M	SD	Level
1	The use of GenAI raises concerns about academic integrity and the potential for plagiarism.	3.99	1.16	High
2	I am concerned that students may become overly reliant on GenAI tools for their assignments and learning.	3.85	1.22	High
3	The increasing use of GenAI in education could lead to an over-dependence on technology.	3.81	1.14	High
4	I am concerned about the ethical implications of using GenAI in higher education.	3.74	1.08	High
5	I worry that GenAI might undermine traditional teaching practices and the role of educators.	3.23	1.15	Moderate
6	I worry that the widespread adoption of GenAI could threaten job security for faculty members.	3.17	1.20	Moderate
7	I am concerned about the financial costs associated with implementing and maintaining GenAI tools in higher education.	3.10	1.04	Moderate
8	I am concerned about the quality and accuracy of content generated by AI tools like ChatGPT.	3.07	1.12	Moderate
	Total	3.49	0.84	Moderate

1 = 'Strongly Disagree', 2 = 'Disagree', 3 = 'Neutral', 4 = 'Agree', 5 = 'Strongly Agree'.

$SD = 1.15$) and item 6, “I worry that the widespread adoption of GenAI could threaten job security for faculty members.” ($M = 3.17$, $SD = 1.20$) Faculty members had close to neutral concerns regarding the quality and accuracy of content generated by AI tools; they responded least positively to item 8, “I am concerned about the quality and accuracy of content generated by AI tools like ChatGPT” ($M = 3.07$, $SD = 1.12$). Similarly, faculty members had close to neutral concerns about the cost of using GenAI in education, reflected in their response to item 7, “I am concerned about the financial costs associated with implementing and maintaining GenAI tools in higher education.” ($M = 3.10$, $SD = 1.04$).

It is easy to generate content using GenAI tools (Kalla et al., 2023), the ease of generating content using GenAI tools might be one of the reasons behind the faculty members’ concerns about the effect of GenAI tools on academic integrity and plagiarism as well as the ethical implications associated with the use of these tools. In addition, the ease of generating content by GenAI tools might contribute to faculty members’ concerns about students’ reliance on GenAI tools and technology overdependencies. However, faculty members’ concerns about the impact of generative AI on their roles as educators, job security, and the associated costs were less intense than their concerns about these tools’ effects on their students. Faculty members viewed GenAI tools as supplementary tools rather than a replacement for human educators.

The moderate overall score suggests that faculty members are transitioning to accepting GenAI tools and their application in higher education. The findings suggest that faculty members were more concerned about students’ use of GenAI tools, particularly in terms of academic integrity, plagiarism, and over-reliance on technology, rather than the personal impact of GenAI tools on their roles, job security, or traditional teaching practices.

Findings stress the need for clear GenAI rules in student work. Monitoring is needed to ensure integrity and prevent GenAI-related plagiarism. In addition, concerns about students’ overreliance on GenAI tools, as well as the impact of GenAI on traditional teaching, highlight the need to design instruction that balance the use of technology, particularly GenAI, with the promotion of self-regulation and student agency. In addition, the finding suggests the need for training both students and faculty on how to use and critically assess the content of GenAI tools ethically. In addition, the findings necessitate the creation

of AI governance frameworks that include clear policies on plagiarism, usage boundaries, and AI-assisted assessment.

The findings regarding faculty members’ concern about issues of academic integrity and plagiarism associated with the use of GenAI in education aligned with the findings of previous studies (Kiryakova and Angelova, 2023; Malik, 2024) which found that faculty members had worries about the unethical use of GenAI tools and possible plagiarism and academic dishonesty associated with the use of these tools. In addition, the findings regarding faculty members’ concern about over-reliance on technology aligned with the findings of a similar study (Al-Mughairi and Bhaskar, 2024). The findings of the current study are supported by Yusuf et al. (2024), who highlighted the significant role of both cultural and institutional contexts in shaping perceptions of GenAI in higher education. Their cross-cultural analysis demonstrated that participants from cultures with high uncertainty avoidance and strong long-term orientation were likelier to associate GenAI use with academic dishonesty and support stricter regulatory measures. Similarly, our study found that faculty members’ concerns—particularly those related to plagiarism, over-reliance, and ethical misuse—may be influenced not only by personal values but also by broader cultural expectations and institutional norms that emphasize academic integrity and traditional pedagogical practices. Furthermore, institutions that structured training may reinforce ambiguity and apprehension among faculty regarding GenAI tools. These findings collectively emphasize the need for culturally responsive and institutionally supported frameworks that provide clear policies, ethical guidelines, and targeted training to ensure the responsible integration of GenAI in educational settings.

4.4 Fourth research question: what is the level of utilization of GenAI tools by faculty members in education?

Regarding the faculty members’ responses to the items indicating their level of utilization of GenAI tools, the results showed that their level of utilization of GenAI was lower than their level of awareness and perceived benefits of these tools. Overall, they demonstrated a moderate level of utilization ($M = 2.86$, $SD = 1.00$). Table 6 shows the means, standard deviations, and levels of faculty

TABLE 6 Means and standard deviations of faculty members’ responses regarding faculty members’ uses of GenAI tools ($N = 102$).

	Uses of GenAI tools	<i>M</i>	<i>SD</i>	Level
1	I use GenAI tools to assist with my research activities, such as literature reviews or data analysis.	3.15	1.28	Moderate
2	I use GenAI tools to help develop new curriculum materials or update existing ones.	3.11	1.26	Moderate
3	I recommend GenAI tools to students for additional support outside of class.	2.99	1.19	Moderate
4	I use GenAI tools to help with administrative tasks, such as drafting emails or creating documents.	2.92	1.26	Moderate
5	I use GenAI tools to assist with providing feedback and grading student work.	2.87	1.26	Moderate
6	I regularly use GenAI tools, such as ChatGPT, in my teaching activities.	2.62	1.20	Moderate
7	I design assignments that require or encourage students to use GenAI tools.	2.61	1.32	Moderate
8	I incorporate GenAI tools into my classroom lectures and discussions.	2.58	1.17	Moderate
	Total	2.86	1.00	Moderate

1 = ‘Strongly Disagree’, 2 = ‘Disagree’, 3 = ‘Neutral’, 4 = ‘Agree’, 5 = ‘Strongly Agree’.

members' responses regarding their level of utilization of GenAI tools.

The results indicated that participants' level of agreement regarding the extent of generative AI usage, as presented in the questionnaire, ranged from "neutral" to "agree" across three items: for accomplishing research activities ($M = 3.15$, $SD = 1.28$), and developing and updating educational materials such as new curriculum materials ($M = 3.11$, $SD = 1.26$). However, for the remaining items, participants' level of agreement ranged from "disagree" to "neutral." These items were related to the use of GenAI tools providing additional support for students outside of class ($M = 2.99$, $SD = 1.19$), completing administrative tasks ($M = 2.92$, $SD = 1.26$), providing feedback and grading student work ($M = 2.87$, $SD = 1.26$), teaching activities ($M = 2.62$, $SD = 1.20$), designing assignments that involve the use of generative AI tools ($M = 2.61$, $SD = 1.32$), and facilitating in class discussion ($M = 2.58$, $SD = 1.17$).

A possible explanation of the indecision or moderate level of the utilization of GenAI tools is that the popularity of GenAI tools and their applications in education are still in their early stages, as ongoing debates persist regarding their formal use in education (Strzelecki, 2023). Based on the adoption models, adopting new technologies like GenAI tools can take time (Rogers, 1995) and go through multiple stages such as knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1995). Furthermore, need institutional support and facilitating conditions (Venkatesh et al., 2016) as educators gradually build an understanding of these tools. In addition, the findings regarding the faculty members' perceptions of the benefits and concerns of GenAI tools contribute to the explanation of the variation in the utilization level of GenAI tools for different purposes, where faculty members were concerned about students' use of tools.

The findings suggest that faculty members' use of GenAI tools in education is still in its early stages. Many faculty members can be described as in the "awareness-to-practice" gap, unsure of how to operationalize GenAI in their specific teaching contexts. Faculty members appear open to using GenAI for specific purposes, such as conducting research and developing educational materials, but remain cautious about its use in direct teaching and assessment. This caution likely stems from concerns about potential negative impacts on academic integrity and student over-reliance on GenAI tools.

These findings suggest that while there is some acceptance of GenAI tools in education, institutions should offer targeted support to help faculty members enhance their use of these tools, considering their perceived benefits and concerns. This support could include offering training, providing resources, and developing clear policies and guidelines to govern the effective use of generative AI tools by

students and faculty members. In addition, higher education institutions can provide templates for classroom use and communities of practice that allow peer support and experimentation.

The findings regarding the level of utilization of GenAI tools aligned with some research studies that found that faculty members moderately use GenAI tools like ChatGPT to assist in research activities (Malik, 2024) to get through some streamlined repetitive tasks (Goli-Cruz, 2024), while they contradicted other research studies that found faculty members moderately use GenAI tools like ChatGPT teaching and supporting students' tasks (Amani et al., 2023;)

4.5 Fifth research question: how do the levels of awareness, perceived benefits, perceived concerns, and utilization of GenAI tools in education differ among faculty members based on gender and academic rank?

The differences in participants' perspectives on GenAI regarding the level of awareness, perceived benefits, perceived concerns, and utilization, and some of their demographic characteristics were examined through t-tests and analysis of variance (ANOVA) tests. Demographic characteristics included gender and academic rank.

4.5.1 Gender and participants' perspectives of GenAI

Faculty members' perspectives on GenAI tools regarding the levels of awareness, perceived benefits, concerns, and utilization, were compared, based on gender through t-tests (Table 7).

The results showed significant variations between male and female participants on their awareness, perceived benefits, and level of utilization of GenAI tools. Female faculty members had a higher awareness, perceived benefits, and utilization of GenAI tools than male faculty members. However, the results showed insignificant variations between male and female participants in terms of their perceived concerns associated with GenAI tools. The findings suggest that despite the differences in awareness, perception of benefits, and use of GenAI tools based on gender, concerns about GenAI tools remain a common issue across genders.

A possible explanation could be that women tend to engage more in collaborative learning environments and are more cooperative and willing to share resources than males (Pearson et al., 1994). As a result,

TABLE 7 Results of t-tests and descriptive Statistics levels of awareness, perceived benefits, concerns, and utilization of GenAI tools by Gender.

Outcome	Group						t	df	p
	Male			Female					
	M	SD	50	M	SD	n			
Awareness	3.19	0.88	50	3.59	0.87	52	−2.33*	100	0.022
Benefits	3.55	0.92	50	3.99	0.82	52	−2.52*	100	0.013
concerns	3.60	0.80	50	3.59	0.88	52	1.07	100	0.286
Uses	2.66	1.07	50	3.05	0.90	52	2.01*	100	0.047

* $p < 0.05$.

they are more likely to exchange knowledge within peer groups. This networked form of learning may contribute to a higher level of awareness, perceived benefits, and utilization of GenAI tools. However, male and female faculty members perceive similar concerns in using these tools. Therefore, educational institutions may need to provide faculty members with tailored interventions, e.g., training focusing on raising awareness, and perceived benefits promoting actual use of GenAI tools, particularly for males, while simultaneously addressing shared barriers of GenAI tools.

These findings differ from those of [Elsaadany's \(2024\)](#) study, which found that faculty members' perspectives of the use of ChatGPT in EFL Classrooms did not differ based on their gender.

4.5.2 Rank and participants' perspectives of GenAI

Faculty members' perspectives on GenAI tools in terms of the levels of awareness, perceived benefits, concerns, and utilization, were compared, based on academic rank through One-Way ANOVA tests ([Table 8](#)). The ranks of faculty members generally mirror both their ages and academic experiences.

The results showed that faculty members' perspectives on GenAI tools regarding the levels of awareness, perceived benefits, concerns, and utilization did not differ based on their academic rank. This suggests that understanding and adopting these tools are uniform across faculty members' ranks. A possible explanation of such uniformity is the recent emergence of popular GenAI tools, where the most popular tool among GenAI tools, i.e., ChatGPT, was developed in late 2022 ([Rajaraman, 2023](#)); before then, the participants from different ranks had equal exposure to these tools. Educational institutions might need to support all faculty members equally in adopting GenAI tools, without needing to differentiate by academic rank. In addition, pedagogical leadership must be cultivated at all levels to mainstream GenAI use in meaningful, context-sensitive ways.

5 Conclusion and recommendations

Results showed that faculty members had moderate levels of awareness of GenAI tools, with some key areas standing out, i.e., their impact on education, ethical implications, and ease of use. In comparison, some areas were less developed, i.e., functionality of GenAI tools and associated technical concepts. Faculty members had positive and high levels of perceptions of the benefits of GenAI tools and their application in educational practice, particularly in reducing administrative tasks, supporting research, fostering innovation in curriculum design, and enhancing online learning. However, faculty members had a more limited view of the benefits of GenAI tools in

some areas, i.e., classroom integration, future workforce preparation, personalized learning, and student learning enhancement.

Faculty members are confident in the benefits of GenAI tools when they employ such tools, but they are more cautious about students' use of these tools. Results showed that faculty members had moderate concern regarding GenAI and their application of the educational practice. The key concerns were related to the adverse effect of GenAI on academic integrity, the potential for plagiarism, over-reliance on these tools, over-dependence on technology, and ethical implications. However, less intense concerns were reported in other areas, i.e., impact on traditional teaching, shift in educators' roles, costs, content quality, and job security threat. The findings suggest that faculty members were more concerned about students' use of GenAI tools rather than the personal impact of GenAI tools. Regarding the actual utilization of GenAI tools in educational practice, faculty members reported a moderate level of utilization of these tools, where they generally agreed or remained neutral about the various possible uses of GenAI tools in their educational practice. The participants reported a lower utilization of GenAI tools compared to their awareness and perceptions of the benefits, indicating that they are still in the early stages of adopting these tools.

The results showed significant variations between male and female participants on their awareness, perceived benefits, and level of utilization of GenAI tools. However, the results showed insignificant variations between male and female participants regarding GenAI tools' perceived concerns. In addition, the results showed insignificant variations in faculty members' awareness, perceived benefits, concerns, and level of utilization of GenAI tools based on their rank.

5.1 Recommendations for practice

Based on the findings of this study, several recommendations can be offered for policy and practice concerning the use of GenAI tools or similar technologies in the field of higher education. These recommendations relate directly to strategies that policymakers and practitioners can implement to ensure the successful use and integration of GenAI tools, and the faculty members and their students get the benefit of the use of these tools in the educational practice. The recommendations concerning the use and integration of GenAI tools in educational practice relate to four categories: awareness of faculty members of GenAI tools, their perceived benefits of GenAI tools, their perceived concerns of GenAI tools, and the actual use of GenAI tools in educational practice.

The effect of GenAI tools on education is inevitable, as is evident in faculty members' responses to the first item in the awareness

TABLE 8 One-Way ANOVA- faculty members' responses to the levels of awareness, perceived benefits, concerns, and utilization of GenAI tools for academic rank.

Outcome	df	F	p
Awareness	3	0.15	0.929
Benefits	3	0.73	0.537
Concerns	3	0.30	0.824
Uses	3	0.75	0.523

1 = "Lecturers," 2 = "Assistant Professor," 3 = "Associate Professor," 4 = "Professor".

scale. Faculty members showed confidence to learn about GenAI tools and a willingness to know more about these tools. Therefore, there is a need to enhance their awareness in some areas about the GenAI tools and their application in educational practice, i.e., GenAI tools' working mechanism, the possible uses of the tools in educational practice, and technical concepts associated with GenAI tools. In addition, there is a need to reinforce their awareness of some common issues regarding these tools, i.e., the effect of GenAI tools on educational practice and associated ethical issues related to GenAI tools. Therefore, policymakers and practitioners should use various ways to increase educators' awareness about specific GenAI tools and their applications in educational practice. The literature showed some common ways to increase educators' awareness of specific issues; these ways include training programs (Bayar, 2014), social media platforms (La Rocca and Boccia Artieri, 2022), and involving individuals in policy discussions. In addition, peer learning has proven to be effective in raising educators' awareness (Topping et al., 2017). Therefore, policymakers and practitioners should facilitate discussion and exchange experiences among faculty members about GenAI tools and their applications in the educational practice of on the institutional, national, and international levels.

Regarding the faculty members' perceptions of the benefits of GenAI tools, the higher education institutions can take advantage of their high agreement on the benefits of GenAI tools in accomplishing administrative tasks, facilitating research, developing innovation in curriculum design, and improving online learning. This suggests that institutions of higher education could integrate GenAI tools across departments to handle administrative tasks, e.g., grading, providing access to GenAI tools that facilitate research activities, providing training on using GenAI tools for curriculum innovation, and facilitating the delivery of online courses with the aid of GenAI tools. However, the lower perceived benefit of the GenAI tools in enhancing students' education requires institutions of higher education to issue policies and provide training for faculty members on how to use GenAI tools to enhance students' learning and to cater to diverse student needs.

Considering faculty members' high-level concerns in some areas related to GenAI tools and their applications in education, this suggests that institutions of higher education should consider these concerns by establishing guidelines that set up the rules regarding students' use of GenAI in their academic work, establishing monitoring systems to address the issue of the effect of GenAI tools on academic integrity and the potential plagiarism associated with the use of these tools; provide appropriate resources for faculty members that would detect to plagiarism associated with the use of these tools, provide training for faculty members on how to design assignments that ensure balance use of GenAI tools and encourage critical thinking skills. Given faculty members' moderate level concerns in some areas related to GenAI tools and their applications in education, institutions of higher education should provide training on how to integrate GenAI tools to enhance traditional teaching methods, provide faculty members with free access to GenAI tools, and implement quality control processes related to generated content of GenAI tools.

Given the moderate utilization of GenAI tools by faculty members, it suggests that while there is some acceptance of GenAI tools in education, institutions should offer targeted support to help faculty members enhance their actual use of these tools, considering

both their perceived benefits and concerns. This support could take multiple forms, including providing digital platforms that faculty members can use to present best practices for using GenAI tools. In addition, training could be provided for faculty on how to use GenAI tools to design curriculum, conduct research, facilitate students' assessment, accomplish administrative tasks, design assignments that require students to use GenAI tools ethically, and use GenAI to facilitate in-class discussion. Furthermore, institutions should provide access to advanced GenAI tools that can be used in research and provide formal guidelines and training for students on how to use GenAI tools responsibly. Finally, the significant variations between male and female participants on their awareness, perceived concern, and level of utilization of GenAI tools suggest that educational institutions should provide faculty members with tailored interventions based on gender.

The current study indicates the requirements for educational management in higher education institutions to facilitate the implementation of GenAI tools by establishing clear policies and investing in infrastructure to support the responsible use of GenAI in higher education. Institutions should monitor usage, encourage cross-departmental collaboration, and align GenAI integration with national digital strategies to enhance teaching, research, and administrative efficiency.

The previous recommendations were based on the findings specific to Kuwaiti faculty members, however, several recommended practices such as the ones that are related to enhancing awareness, offering training, addressing ethical concerns, and integrating GenAI into curriculum and administrative work were potentially generalizable to similar higher education contexts, particularly in the Arab countries or other countries that are looking to integrate digital technology in their higher education systems.

5.2 Recommendations for future studies

Future research studies might be conducted with different study settings, disciplines, research samples, sampling procedures, and data collection methods to gain a comprehensive and deep understanding of faculty members' perspectives on GenAI tools and their applications in education. The sample size was 102 faculty members, with almost half of the participants from the College of Education. Future research studies should consider a larger sample of faculty members across a range of disciplines to improve the generalizability of the findings. Besides studies investigating faculty members' perspectives on GenAI tools, there is a need to examine administrators' perspectives on GenAI tools to provide a more comprehensive view of GenAI acceptance in higher education.

The current study provides several practice recommendations providing professional training programs to promote efficient and ethical use of GenAI tools in educational practice and developing guidelines, policies, and monitoring systems that govern the proper educational uses of GenAI tools in educational practice. Therefore, future studies should be conducted to design and develop these interventions. In addition to providing training to faculty members and developing guidelines of use, the current study recommended facilitating access and integration of GenAI tools for various purposes, e.g., accomplishing administrative tasks, facilitating research, developing innovation in curriculum design, and improving online learning. Therefore, future research should

examine how best to integrate GenAI tools into these processes to maximize efficiency without compromising the quality of work.

5.3 Study's limitations

The current study have some limitations. One of these limitations is related to the representativeness of the participants based on their major. The participants were faculty members from two universities who were invited to participate in the current study using online invitation letters and consent forms that were sent using electronic groups for faculty members. The two institutions were selected due to their accessibility, which facilitated participant recruitment, and data collection. Participation in the study was entirely voluntary. The great majority of participants were from the college of education. Possible explanation might relate to the topic of the research that capture the attention of faculty members from college of education more than other faculty members from other colleges since their majors related to the teaching methods and incorporating new technologies in the educational settings. In addition, faculty members from college of education might complete the questionnaire due to their proximity to the authors and that might cause possible self-selection bias. Such consistency in participants' majors might limit the generalizability of the findings and limit the capability of examining the difference in the participants' perceptions based on their major.

In addition to the limitations related to the representativeness of the sample, the exclusive quantitative approach of the current study represents a limitation where methodological triangulation would enrich the findings. Furthermore, the lack of items in the data collection tool that examine most used GenAI tools represent a limitation in the current study.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and

institutional requirements. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent from the participants or participants legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

BA: Formal analysis, Validation, Project administration, Data curation, Supervision, Methodology, Investigation, Writing – original draft, Conceptualization, Resources, Funding acquisition, Visualization, Software. AA: Supervision, Writing – review & editing, Methodology.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that Gen AI was used in the creation of this manuscript.

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