QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

ENGINEERING FACULTY PERCEPTIONS OF CHATGPT: OPPORTUNITIES, CHALLENGES, AND ETHICAL CONSIDERATIONS IN EDUCATION

Jehanzeb Khan*

Lecturer at Balochistan University of Engineering and Technology, Khuzdar, Pakistan.
jehanzebkhan@buetk.edu.pk / jehanzebkhan.elt@gamil.com

Tabsum Atta

BS. English Language and Literature, Balochistan University of Engineering and Technology, Khuzdar, Pakistan. tabsumatta@gmail.com

Yasra Hussain

BS. English Language and Literature, Balochistan University of Engineering and Technology, Khuzdar, Pakistan. yasrahussian786@gmail.com

Fouzia Malik,

Education officer, Sindh Education Literacy Department, Government of Sindh, Pakistan, Pakistan fouziamalik23@gmail.com

Abstract

This study investigates engineering faculty members' perceptions of the ethical integration of ChatGPT, a generative AI tool, in teaching practices at the University of Engineering and Technology (UET) in Balochistan, Pakistan. As AI technologies continue to shape the educational landscape, the ethical considerations surrounding their use, especially in technical fields like engineering, have become a significant focus. Using a quantitative, cross-sectional survey design, this study collected data from 40 engineering faculty members across six departments to assess their awareness, perceived benefits, challenges, and training needs regarding ChatGPT. The findings indicate high levels of awareness (85%) and usage (85%) of ChatGPT among faculty, with 75% reporting that it enhances student engagement and simplifies complex engineering concepts. Despite these positive perceptions, 57.5% of respondents expressed concerns about reliability, accuracy, and the potential for ChatGPT to undermine critical thinking and academic integrity. These results highlight the dual nature of ChatGPT's role in education—offering significant educational benefits while presenting ethical challenges. The study underscores the need for comprehensive faculty training, clear institutional policies, and ethical guidelines to ensure responsible integration of AI tools in higher education. This research contributes to the growing discourse on AI in education, particularly in engineering, by offering insights into the opportunities, risks, and strategies for promoting ethical AI use.

Keywords: ChatGPT, Engineering Education, Teachers' Perceptions, Ethical Integration, AI in Teaching

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

1. Introduction:

The rapid advancement of artificial intelligence (AI) technologies, particularly ChatGPT by OpenAI, has significantly transformed many sectors, including education. Launched in November 2022, ChatGPT is a generative AI tool that can produce human-like text, offering new opportunities and challenges in educational settings (Zhai, 2022). As its applications grow, particularly in higher education, the ethical implications of integrating AI tools into teaching and learning practices have come into sharp focus. This is particularly critical in fields such as engineering, where the precision and integrity of academic work are paramount (Kasneci et al., 2023).

In the context of engineering education, ChatGPT presents both opportunities and concerns. On the one hand, it offers the potential to simplify complex technical concepts, enhance student engagement, and provide real-time feedback (Dwivedi et al., 2023). However, ethical challenges exist, including concerns about academic integrity, overreliance on AI tools, and the accuracy of the information generated (Vargas-Murillo et al., 2023). These concerns highlight the need for a balanced approach to integrating AI into educational practices, ensuring its benefits are maximised while its risks are mitigated.

There has been a growing interest in the implications of mobile technology (Khan & Panhwar, 2025) and AI tools such as ChatGPT in higher education in Pakistan. Kanwal et al. (2023) explored how university-level teachers in Pakistan perceive ChatGPT's role in improving student learning and teaching effectiveness, while raising concerns about its potential misuse, such as cheating and plagiarism. Similarly, Malik (2024) examined the challenges university teachers in Pakistan face in adopting AI-based educational tools, including concerns about academic fraud and the need for comprehensive training in their use. These studies underscore the importance of considering the ethical implications of integrating AI tools into educational contexts in Pakistan.

This study aimed to investigate the perceptions of engineering faculty at a public-sector UET in Balochistan, Pakistan, regarding the ethical integration of ChatGPT into teaching practices. Given that engineering faculty play a pivotal role in shaping the next generation of engineers, understanding their perspectives on using AI tools such as ChatGPT is essential for fostering ethical, effective, and responsible integration in educational settings. This study specifically

focuses on faculty awareness, perceived benefits, challenges, and training needs for the ethical use of ChatGPT in engineering education.

This study employed a quantitative research approach with a cross-sectional survey design to assess faculty perceptions at a single point in time. By gathering data from faculty across various engineering disciplines, this study seeks to identify common themes in their perceptions and explore any variations based on academic qualifications or departmental affiliation. The findings from this research aim to provide valuable insights into how ChatGPT is perceived as both a tool for enhancing teaching and a potential ethical challenge in engineering education in Pakistan.

The rapid advancement of artificial intelligence (AI) technologies, particularly ChatGPT by OpenAI, has significantly transformed many sectors, including education. Launched in November 2022, ChatGPT is a generative AI tool that can produce human-like text, offering new opportunities and challenges in educational settings (Zhai, 2022). As its applications grow, particularly in higher education, the ethical implications of integrating AI tools into teaching and learning practices have come into sharp focus. This is particularly critical in fields such as engineering, where the precision and integrity of academic work are paramount (Kasneci et al., 2023).

In the context of engineering education, ChatGPT presents both opportunities and concerns. On the one hand, it offers the potential to simplify complex technical concepts, enhance student engagement, and provide real-time feedback (Dwivedi et al., 2023). However, ethical challenges exist, including concerns about academic integrity, overreliance on AI tools, and the accuracy of the information generated (Vargas-Murillo et al., 2023). These concerns highlight the need for a balanced approach to integrating AI into educational practices, ensuring its benefits are maximised while its risks are mitigated.

There has been a growing interest in the implications of AI tools such as ChatGPT in higher education in Pakistan. Kanwal, Hassan, and Iqbal (2023) explored how university-level teachers in Pakistan perceive ChatGPT's role in improving student learning and teaching effectiveness, while raising concerns about its potential misuse, such as cheating and plagiarism. Similarly, Malik (2024) examined the challenges university teachers in Pakistan face in adopting AI-based educational tools, including concerns about academic fraud and the need for comprehensive training in their use. These studies underscore the importance of

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

considering the ethical implications of integrating AI tools into educational contexts in Pakistan.

1.2 Problem Statement:

This study aimed to examine engineering teachers' perceptions of ChatGPT in the context of teaching and learning. Specifically, it seeks to assess the impact, perceived benefits, and challenges of using ChatGPT, as well as its potential ethical implications. This research quantitatively examines how faculty members at a public-sector engineering and technology university in Balochistan perceive the tool's effects on student engagement, academic integrity, and critical thinking. It will also examine the degree to which faculty members trust the reliability and accuracy of information generated by ChatGPT and whether they see the tool as a beneficial addition to their teaching practices or a potential source of ethical issues. This study provides insights into the advantages and disadvantages of incorporating ChatGPT into engineering education, focusing on the quantitative evaluation of faculty perceptions. Understanding these perceptions will highlight the key challenges and opportunities associated with its use and help identify the factors influencing teachers' decisions to adopt or reject this technology in their teaching.

1.3 Research Objectives:

- To quantitatively assess engineering teachers' perceptions of ChatGPT's benefits and challenges in teaching and learning.
- To evaluate teachers' concerns regarding the ethical implications of using ChatGPT in their courses.
- To identify the factors influencing teachers' willingness to adopt ChatGPT in their teaching practices.

1.4 Research Questions:

- What are the benefits and drawbacks of using ChatGPT in teaching and learning, according to the engineering faculty?
- To what extent do teachers believe ChatGPT affects students' critical thinking abilities?
- How confident are teachers regarding the accuracy and reliability of the information generated by ChatGPT?

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

2. Literature Review

2.1 Perceived Benefits of ChatGPT in Teaching and Learning

The integration of AI tools, such as ChatGPT, in educational settings has been recognised as a potential enhancer of teaching and learning. A growing body of research highlights ChatGPT's ability to simplify complex technical concepts and improve student engagement. According to Kasneci et al. (2023), AI tools can help engineering educators present complex topics more easily, fostering a deeper understanding of the content. This capability can be particularly advantageous in engineering education because it helps students grasp abstract concepts and solve real-world problems.

Furthermore, ChatGPT is often considered an effective feedback tool. Arguello et al. (2024) noted that AI technologies can provide real-time feedback, which is critical for students in technical fields who need immediate clarification of concepts. Teachers also perceive ChatGPT as a tool for generating relevant teaching materials, such as practice problems, summaries, and explanations, thereby reducing their workload and enhancing learning outcomes.

In engineering, Söderström et al. (2024) found that STEM educators highlighted personalised learning as a key benefit of ChatGPT. By tailoring responses to individual students' needs, ChatGPT can support adaptive learning in engineering disciplines, where students often have varying levels of understanding and learning speeds.

2.2 Challenges and Ethical Concerns in the Use of ChatGPT

Although ChatGPT offers numerous benefits, it also introduces several challenges concerning academic integrity and critical thinking. Bhaskar et al. (2025) emphasise that one of the primary concerns of educators is the potential for students to misuse ChatGPT to complete assignments dishonestly. The convenience of generating answers with AI might discourage students from engaging in critical thinking, thereby hindering the development of their problem-solving skills. Teachers worry that overreliance on AI tools may lead to diminished cognitive skills and an inability to think critically, a concern echoed by Vargas-Murillo et al. (2023) in their study of ChatGPT's impact on student learning outcomes.

Additionally, the accuracy and reliability of ChatGPT-generated information remain significant concerns for engineering educators. Synekop et al. (2024) noted that while ChatGPT can generate content efficiently, its responses might sometimes lack the necessary technical accuracy required in fields like engineering, where precision is crucial.

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

Lytovchenko et al. (2024) argued that relying on AI-generated information without critical evaluation could lead to misinformation or errors, particularly in technical disciplines.

2.3 Factors Affecting Teachers' Confidence in ChatGPT

Teachers' confidence in ChatGPT's reliability and effectiveness largely depends on their experience with AI tools and perceived training requirements. Studies have shown that educators who feel technologically proficient are more likely to adopt AI tools in their teaching practices. Söderström et al. (2024) found that engineering educators with higher levels of digital literacy were more inclined to integrate ChatGPT into their classrooms. However, many instructors have expressed concerns about their lack of training in using these tools effectively. Perveen and Amani (2024) suggested that faculty members would benefit from professional development programs that provide them with the skills needed to integrate AI tools responsibly into their teaching strategies.

The lack of adequate training also contributes to scepticism regarding AI. Teachers in a study by ElSayary (2024) acknowledged the benefits of ChatGPT but were uncertain about its broader educational implications without proper guidelines and training. This supports the argument that the effective implementation of AI in education requires robust institutional support and clear ethical guidelines to ensure its responsible use.

2.4 ChatGPT's Impact on Critical Thinking

One of the most debated aspects of using ChatGPT in education is its potential impact on critical thinking. Many educators fear that AI tools may encourage students to rely too heavily on technology, thereby reducing their ability to analyse and synthesise information independently. Beege et al. (2024) highlighted this concern, noting that while AI can facilitate learning by providing information quickly, it might discourage students from developing problem-solving and analytical thinking skills—key components of engineering education. This raises important ethical questions regarding the role of AI in fostering intellectual growth.

However, not all perspectives were negative. Some educators believe that ChatGPT, when used correctly, can enhance critical thinking by serving as a learning aid that promotes deeper engagement with the material being studied. According to Lukhmanov and Perveen (2025), ChatGPT can simulate complex engineering problems, enabling students to think critically about potential solutions rather than providing ready-made answers.

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

2.5 Teacher Training and Support for Ethical AI Use

To address concerns about the potential risks of ChatGPT, many researchers have argued that proper teacher training is essential for the ethical incorporation of AI in education. Stoyanova-Petrova et al. (2025) found that teachers trained in AI integration were better equipped to utilise these tools without compromising academic integrity. Furthermore, training programs that focus on the ethical use of AI tools can help educators identify misuse and ensure that students learn in a responsible, critical-thinking-oriented environment. Söderström et al. (2024) also argue that institutional policies that provide clear guidelines for using ChatGPT can mitigate its potential negative effects. ElSayary (2024) highlights the importance of creating an ethical framework for AI use, including ensuring that students are encouraged to think critically and use AI tools as supplements rather than substitutes for their own intellectual efforts.

Although ChatGPT offers numerous advantages for teaching and learning, including enhanced student engagement, simplified complex concepts, and real-time feedback, it also introduces significant ethical challenges related to academic integrity and critical thinking. Teacher perceptions are influenced by their confidence in AI's reliability of AI, their experience with digital tools, and the availability of adequate training. For ChatGPT to be successfully integrated into engineering education, it is crucial to balance its benefits with careful consideration of its risks and provide faculty with the necessary support and ethical guidelines to use this tool responsibly.

3. Methodology

3.1 Research Design

This study employed a quantitative research approach, utilising a cross-sectional descriptive survey design, to assess engineering faculty members' perceptions of the ethical incorporation of ChatGPT into their teaching practices. This design was strategically chosen to capture faculty viewpoints at a critical moment (mid-March to early April 2025), providing an immediate and relevant snapshot of their experiences, benefits, ethical concerns, and training needs regarding the rapidly evolving generative AI technology used in higher education. The quantitative approach facilitates the statistical analysis of measurable data, ensuring objectivity and providing clear and generalisable insights into teacher perceptions.

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

3.2 Study Setting

The research was conducted at the Public Sector Engineering and Technology University in Balochistan, a major public institution in Pakistan, specialising in technical education. The study's focus on engineering faculty is paramount, as disciplines such as Computer Science, Electrical, Civil, and Mechanical Engineering rely heavily on precision and integrity. The introduction of ChatGPT presents heightened ethical and technical challenges in this context, where over-reliance on AI could potentially compromise the development of critical thinking and problem-solving skills, which are crucial for professional engineering practices.

3.3 Population and Sampling

The target population consisted of full-time teaching faculty at a public-sector UET in Balochistan, Pakistan, across five engineering disciplines. A purposive sampling technique was employed to target faculty with prior experience using AI tools such as ChatGPT in their teaching practices. The final sample size of forty faculty members (total distributed questionnaire 46) represents a diverse range of disciplines and academic qualifications, ensuring the findings are comprehensive and reflective of the broader faculty perceptions

Table 1

Respondent Distribution by Department

Department	**Number of Teachers (n)**	**Respondent (%)**
Total Distributed	46	40
Electrical Engineering	8	17.4
Mechanical Engineering	7	15.2
Software Engineering	13	28.3
Civil Engineering	10	21.7
Biomedical Engineering	2	4.3
Total Respondents	40	86.9

3.4 Data Collection

Data were collected using a structured, self-administered questionnaire adapted from the existing academic literature on AI integration in higher education (e.g., Kasneci et al., 2023;

Dwivedi et al., 2023). The questionnaire included closed-ended questions designed to measure the faculty's perceptions across four primary constructs:

- **Awareness (AW)**: Awareness with ChatGPT and its educational applications.
- **Benefits (B)**: Perceived advantages of enhancing teaching efficiency and student learning outcomes.
- **Challenges (CH)**: Concerns regarding technical accuracy, reliability, and academic integrity/ethical implications of the generated content.
- **Training/Future Use (TFU)**: Perceived need for professional development, institutional guidelines, and willingness to adapt teaching methods;

All items were quantified using a 5-point Likert scale (1 = Strongly Disagree and 5 = Strongly Agree). Data collection employed a dual-modality approach (digital survey via email and printed forms distributed during departmental meetings) over three weeks (mid-March to early April 2025) to maximise accessibility and ensure a 100% response rate.

3.5 Instrument Reliability and Validity

The instrument's content validity was established through the rigorous adaptation of items from the established literature on AI in education. Two subject matter experts reviewed the instrument to ensure its relevance and alignment with the study objectives.

Internal Consistency Reliability: The multi-item scale's reliability was formally assessed using Cronbach's alpha (α). The analysis confirmed that the composite instrument demonstrated good internal consistency across all measured variables, yielding an overall Cronbach's alpha of 0.786. This value exceeds the acceptable threshold of 0.70, confirming that the scale items are closely related and reliably measure the intended underlying constructs of the faculty's perception.

3.6 Data Analysis

The collected ordinal data were analysed using SPSS version 26. Descriptive statistics were calculated for each item and composite construct, including mean scores, standard deviations, and frequency distributions. For inferential analysis, one-sample t-tests were conducted to compare the mean scores of the key constructs against a neutral value of 3.0 on the Likert scale. This approach tested whether faculty perceptions significantly differed from neutral across the four main categories: awareness, benefits, concerns, and training needs.

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

3.7 Ethical Considerations

The study protocol was formally reviewed and approved in compliance with stringent ethical research standards. Informed consent was obtained from all 40 faculty members prior to participation. Participants were guaranteed absolute confidentiality and anonymity, with assurances that their data would be used exclusively for research. No personally identifiable information was collected, and the data were stored securely in accordance with the ethical guidelines for research involving human participants.

4 Results and Discussion

This study aimed to assess engineering faculty's perceptions of ChatGPT and its ethical integration into teaching and learning processes at the Public Sector Engineering and Technology University (UET) in Balochistan, Pakistan. The findings revealed a high level of awareness and use of ChatGPT, along with notable benefits in enhancing teaching practices. However, there were significant concerns, particularly regarding academic integrity, the potential over-reliance on AI, and the need for comprehensive faculty training. The following discussion highlights key findings and suggests areas for improvement in the effective and ethical integration of ChatGPT into engineering education.

4.1 Awareness and Usage of ChatGPT (AW 1 & AW 2)

The data reveal a high level of awareness and use of ChatGPT among faculty members at the public-sector UET in Balochistan. The mean awareness score (4.25) indicates that faculty members are highly familiar with ChatGPT and its capabilities in educational settings. The median and mode values of 5 further emphasise that a significant portion of faculty strongly agree with being aware of the tool. This suggests that ChatGPT has already had a noticeable impact on the university's academic environment. Furthermore, the mean usage score (4.05) indicates that faculty members are not only aware of ChatGPT but are actively incorporating it into their teaching practices. The relatively high mean, coupled with a standard deviation of 1.037, reflects broad consensus among the faculty that they use the tool in their teaching, though with slight variation in its frequency of use across individuals. Overall, these results suggest that the faculty members at Balochistan UET are not only aware of ChatGPT but also actively use it in their daily academic activities.

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

Table 2:

Descriptive Statistics for Awareness and Usage

Variable	Mean	Std. Deviation	Interpretation
1: I am familiar with ChatGPT and its capabilities in educational settings.	4.25	1.056	Faculty members are well-versed in ChatGPT.
2: I have used ChatGPT to support my teaching activities in engineering courses.	4.05	1.037	Most faculty members have actively used ChatGPT in teaching.

4.2 Descriptive Statistics for Perceived Benefits (BQ1 - BQ9)

The effectiveness of ChatGPT in supporting engineering education is perceived positively by the faculty members. The mean scores for BQ1 (4.08) and BQ2 (4.08) reflect strong approval of ChatGPT's ability to provide timely feedback and generate relevant teaching materials. These high mean scores suggest that faculty members find ChatGPT a useful and effective tool for key aspects of teaching, such as providing real-time student feedback and creating course materials. The standard deviations for both of these variables (0.859 and 0.917, respectively) indicate a moderate level of agreement, with some faculty members expressing slightly less enthusiasm. However, overall, the consensus is that ChatGPT is effective. On the other hand, BQ3 (mean = 3.85) reflects a more moderate perception of ChatGPT's ability to reduce time spent on grading assignments. While many faculty members see this as a benefit, the slightly lower mean and the higher standard deviation of 1.075 suggest that not all do. Some may feel that ChatGPT's role in grading assignments is less impactful than in other areas, possibly because grading engineering assignments is more complex. This discrepancy may reflect differences in how faculty members incorporate the tool into their grading practices.

Table 3

Descriptive Statistics for Perceived Benefits (BQ1 - BQ9)

Variable	Mean	Std. Deviation	Interpretation
1: ChatGPT is effective in providing timely feedback to engineering	4.08	0.859	Faculty perceive ChatGPT as highly effective for feedback.

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

Variable	Mean	Std. Deviation	Interpretation
students.			
2: ChatGPT can generate relevant teaching materials for engineering subjects.	4.08	0.917	Faculty agree that ChatGPT is effective in generating teaching materials.
3: ChatGPT reduces the time spent on grading engineering assignments.	3.85	1.075	Moderate agreement, but some faculty express reservations about grading efficiency.
4: ChatGPT can be used without compromising academic integrity in engineering education.	3.72	0.847	Faculty members are concerned about the potential for academic dishonesty.
5: ChatGPT can clarify complex engineering concepts for students.	3.88	1.285	Strong belief that ChatGPT can aid in simplifying difficult concepts.
6: ChatGPT can simulate real-world engineering scenarios for teaching purposes.	3.85	1.075	Faculty see the potential of ChatGPT in simulating real-world scenarios.
7: ChatGPT can improve collaborative learning in engineering group projects.	3.80	1.203	Faculty members believe ChatGPT can enhance collaborative learning, though with some reservations.
8: ChatGPT can prepare students for the industry by providing practical examples.	3.75	1.256	Faculty think ChatGPT can help prepare students for the industry.
9: ChatGPT is useful for assisting students with programming tasks in engineering.	3.65	1.388	Slightly less agreement, but still a positive view of ChatGPT's usefulness for programming.

4.3 Concerns Regarding ChatGPT: Ethical and Academic Integrity Issues (CHQ1-4)

Despite the positive views on ChatGPT's effectiveness, there are significant concerns about its impact on academic integrity and the accuracy of its responses. The data indicate that faculty members are highly concerned about students' potential misuse of ChatGPT. CHQ1 (mean = 3.95) indicates strong concern that students may use ChatGPT to cheat on

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

assignments, reflecting a prevalent concern about academic dishonesty. The standard deviation of 1.131 indicates some variability in the intensity of this concern, with some faculty members expressing stronger apprehension than others. Similarly, CHQ2 (mean = 3.77) indicates that faculty members are sceptical of ChatGPT's responses in technical contexts. This is a significant concern in engineering education, where the precision and correctness of information are paramount. The standard deviation of 1.143 suggests that while there is general scepticism about ChatGPT's technical accuracy, there is variation in the degree to which faculty members trust the tool's responses. The concern that ChatGPT may hinder students' development of problem-solving skills is also noteworthy. With a mean score of 3.90 on CHQ3, faculty members are moderately concerned that relying too heavily on ChatGPT may limit students' ability to think critically and solve complex problems independently. The standard deviation of 1.033 indicates some variation in the responses, but overall, the concern is present across the faculty. Finally, CHQ4 (mean = 3.75) reflects ethical concerns regarding the use of ChatGPT in education. Faculty members are worried about the broader ethical implications of integrating AI into the learning environment. The relatively high mean score underscores the importance of addressing these concerns through clear guidelines and ethical standards for the use of AI tools in academic settings.

Table 4

Descriptive Statistics for Concerns about ChatGPT

Variable	Mean	Std. Deviation	Interpretation
CHQ1: I am concerned that students may use ChatGPT to cheat on assignments.	3.95	1.131	High concern about the potential misuse of ChatGPT for cheating.
CHQ2: I am skeptical of ChatGPT's accuracy in technical contexts.	3.77	1.143	Moderate skepticism about ChatGPT's accuracy in technical fields.
CHQ3: Using ChatGPT may hinder students' development of problem-solving skills.	3.90	1.033	Concern that ChatGPT might limit the development of critical thinking.
CHQ4: I am concerned about	3.75	1.193	Ethical concerns about the broader

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

Variable	Mean	Std. Deviation	Interpretation
ethical issues related to using ChatGPT in education.			implications of using ChatGPT.

4.4 Descriptive Statistics for Training Needs and Willingness to Adapt (TampFUQ1 - TampFUQ4)

The faculty members' training needs and willingness to adapt their teaching methods to integrate ChatGPT into their courses were also assessed. The mean score for TFUQ1 (3.50) reveals a moderate consensus among faculty that they need training to integrate ChatGPT into their teaching effectively. The standard deviation of 1.177 indicates a degree of variability in how strongly faculty feel about the necessity for training, with some faculty members more confident in their ability to use ChatGPT without formal training. This result highlights a key challenge in the successful adoption of AI tools in education: the need for adequate professional development and support to ensure that faculty are equipped to use them effectively.

In addition, TampFUQ2 (mean = 3.70) indicates that faculty members recognise ChatGPT's potential to support personalised learning for students. The tool's ability to tailor responses to individual student needs is viewed as an advantage, with some faculty members particularly valuing this feature for engineering education, where student understanding can vary significantly. The standard deviation of 1.043 suggests moderate agreement with this statement, indicating that while most faculty members see the potential of personalised learning, others may be less certain about its applicability or impact.

The willingness to adapt teaching methods to include ChatGPT is moderately high, with a mean score of 3.72 for TampFUQ3. Faculty members express a general openness to integrating ChatGPT into their teaching, provided they receive appropriate support and training. The standard deviation of 1.132 indicates some variation, with a few faculty members less willing to adopt new teaching methods. This suggests that while the majority of faculty are open to adapting their methods, there is still a need for more structured guidance and assistance in implementing ChatGPT effectively. Finally, TampFUQ4 (mean = 3.75) indicates that faculty members believe that ChatGPT will become increasingly important in engineering education. The standard deviation of 1.104 indicates that while there is

widespread belief in ChatGPT's growing significance, some faculty members may have reservations about its long-term role or the extent of its impact.

The faculty members' training needs and willingness to adapt their teaching methods to integrate ChatGPT into their courses were also assessed. The mean score for TFUQ1 (3.50) reveals a moderate consensus among faculty that they need training to integrate ChatGPT into their teaching effectively. The standard deviation of 1.177 indicates a degree of variability in how strongly faculty feel about the necessity for training, with some faculty members more confident in their ability to use ChatGPT without formal training. This result highlights a key challenge in the successful adoption of AI tools in education: the need for adequate professional development and support to ensure that faculty are equipped to use them effectively.

In addition, TampFUQ2 (mean = 3.70) indicates that faculty members recognise ChatGPT's potential to support personalised learning for students. The tool's ability to tailor responses to individual student needs is viewed as an advantage, with some faculty members particularly valuing this feature for engineering education, where student understanding can vary significantly. The standard deviation of 1.043 suggests moderate agreement with this statement, indicating that while most faculty members see the potential of personalised learning, others may be less certain about its applicability or impact.

The willingness to adapt teaching methods to include ChatGPT is moderately high, with a mean score of 3.72 for TampFUQ3. Faculty members express a general openness to integrating ChatGPT into their teaching, provided they receive appropriate support and training. The standard deviation of 1.132 indicates some variation, with a few faculty members less willing to adopt new teaching methods. This suggests that while the majority of faculty are open to adapting their methods, there is still a need for more structured guidance and assistance in implementing ChatGPT effectively. Finally, TampFUQ4 (mean = 3.75) indicates that faculty members believe that ChatGPT will become increasingly important in engineering education. The standard deviation of 1.104 indicates that while there is widespread belief in ChatGPT's growing significance, some faculty members may have reservations about its long-term role or the extent of its impact.

Table 5

Descriptive Statistics for Training Needs and Willingness to Adapt

Variable	Mean	Std. Deviation	Interpretation

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

Variable	Mean	Std. Deviation	Interpretation
1: I need training to integrate ChatGPT into my teaching effectively.	3.50	1.177	Faculty recognise the need for training to integrate ChatGPT.
2: ChatGPT supports personalised learning for engineering students.	3.70	1.043	Faculty agree that ChatGPT supports personalised learning.
3: I am willing to adapt my teaching methods to include ChatGPT.	3.72	1.132	Faculty are generally willing to adapt their methods with adequate support.
4: ChatGPT will become increasingly important in engineering education.	3.75	1.104	Faculty members believe ChatGPT will play an increasingly important role in education.

The results of the one-sample t-test indicate that faculty perceptions of ChatGPT at UET are significantly more positive than neutral (a mean score of 3.0) across all major categories examined. Starting with awareness, the mean score of 4.15 ($t = 28.325$, $p = 0.000$) clearly shows that faculty members are highly familiar with ChatGPT and its capabilities in educational settings, with a strong consensus indicating that they recognise its potential to enhance their teaching practices. This high level of awareness underscores the growing integration of AI tools like ChatGPT into higher education and reflects faculty engagement with emerging technologies.

Regarding the perceived benefits of ChatGPT, the mean score of 3.83 ($t = 25.879$, $p = 0.000$) indicates that faculty members strongly perceive the tool as beneficial across various educational purposes, particularly for providing timely feedback and generating relevant teaching materials. These findings suggest that faculty members acknowledge ChatGPT's role in enhancing the teaching process, improving the quality of student feedback, and simplifying the creation of course materials, thereby significantly alleviating instructors' workload.

While faculty see the advantages, concerns about ChatGPT also stand out. The mean score for concerns (CHQs) was 3.84 ($t = 23.791$, $p = 0.000$), which suggests that while faculty appreciate ChatGPT's usefulness, they are also significantly concerned about its potential for misuse in cheating, its accuracy in technical contexts, and its possible impact on problem-solving skills and critical thinking. This concern is particularly pertinent in engineering

QUALITATIVE RESEARCH JOURNAL FOR SOCIAL STUDIES
ISSN Online: 3006-4686, ISSN Print: 3006-4678
Volume No: 02 Issue No: 04 (2025)

education, where accuracy and integrity are critical. These results indicate a need for clear ethical guidelines and institutional policies to mitigate these risks and ensure the responsible use of ChatGPT.

Finally, the mean score of 3.67 for training needs ($t = 21.482$, $p = 0.000$) indicates strong recognition among faculty that they need professional development to integrate ChatGPT into their teaching effectively. The fact that faculty are willing to adapt their teaching methods (as reflected in their willingness to engage with the tool) but require training indicates that they see value in ChatGPT but need structured support to use it effectively. This suggests that, for AI tools like ChatGPT to be adopted more widely in higher education, institutions need to provide robust training programs for faculty, equipping them with the skills and knowledge needed to use them optimally.

Table 6

Interpretation of the data

Category	Mean	t-value	df	p-value	Interpretation
AW (Awareness)	4.15	28.325	39	0.000	Faculty are significantly more aware of ChatGPT than neutral.
BQ (Benefits)	3.83	25.879	39	0.000	Perceived benefits of ChatGPT are significantly higher than neutral.
CH (Concerns)	3.84	23.791	39	0.000	Faculty concerns about ChatGPT are significantly greater than neutral.
Training	3.67	21.482	39	0.000	Faculty members significantly recognise the need for training.

5. Conclusion and Recommendations

This study provides a comprehensive exploration of engineering faculty members' perceptions at the Public Sector Engineering and Technology University (UET) in Balochistan, Pakistan, regarding the integration of ChatGPT into teaching and learning. The findings reveal that faculty members are highly aware of ChatGPT and its potential to enhance various aspects of education. The majority of faculty members have incorporated ChatGPT into their teaching, finding it beneficial for simplifying complex concepts, improving student engagement, and generating relevant teaching materials. These positive

perceptions highlight the transformative potential of AI tools in enhancing teaching efficiency, particularly in technical fields like engineering.

However, despite these benefits, the study also uncovered significant concerns. Faculty expressed reservations about the potential for academic dishonesty and the impact of over-reliance on AI tools, particularly on the development of critical thinking and problem-solving skills. The accuracy of AI-generated content, especially in technical disciplines, was another major concern. These findings underscore the need for a balanced approach to integrating AI tools into education—one that maximizes the educational benefits while mitigating the ethical and academic risks.

Moreover, the study revealed a clear need for professional development and training programs to help faculty effectively integrate ChatGPT into their teaching. Faculty members recognized that while they understood the tool's potential, they lacked the necessary skills and training to use it to its full advantage. This gap in expertise underscores the need for institutional support, especially in providing guidance on ethical AI use and in developing strategies to address potential risks.

6 Recommendations

Based on the findings of this study, the following recommendations are made for universities and faculty members to ensure the ethical and effective integration of ChatGPT and similar AI tools into teaching practices:

a. **Establish Clear Ethical Guidelines and Institutional Policies:**
   Universities should develop comprehensive ethical guidelines for the use of AI tools in education. These guidelines should address issues of academic integrity**,** responsible AI use**,** and the limitations of AI-generated content**.** Clear policies will help mitigate concerns about cheating and over-reliance on AI tools, ensuring that these technologies enhance, rather than undermine, the academic experience.

b. **Invest in Continuous Professional Development and Training:**
   To equip faculty with the skills to use AI tools like ChatGPT effectively, institutions should offer ongoing professional development programs that focus on both technical proficiency and ethical use of AI. These programs should emphasize the importance of AI as a complementary tool in teaching, helping faculty to design assignments that encourage critical thinking and active student engagement**.** Additionally, training should

focus on verifying the accuracy of AI-generated content, especially in technical fields like engineering, where precision is critical.

c. Encourage the Use of AI to Support, Not Replace, Active Learning:

Faculty should be encouraged to use ChatGPT in ways that complement traditional teaching methods and support active learning**.** AI tools can be valuable for simplifying complex concepts and providing instant feedback, but they should not replace student interaction or problem-solving exercises. Faculty should design assignments that require students to engage critically with AI-generated content, ensuring that AI use fosters intellectual growth rather than discourages independent thinking.

d. Promote Collaborative Learning through AI:

AI tools like ChatGPT can significantly enhance collaborative learning**,** particularly in group projects. Faculty should structure assignments to encourage peer-to-peer learning and use AI to generate discussion points or real-world scenarios that require teamwork and problem-solving. By fostering a collaborative environment, ChatGPT can help students develop not only technical skills but also communication and collaboration skills critical in engineering education.

e. Strengthen Institutional Support and Resource Allocation:

To ensure the successful integration of AI tools like ChatGPT, universities must provide adequate resources and institutional support**.** This could include setting up platforms for faculty knowledge-sharing, where instructors can exchange best practices for AI integration. Additionally, institutions should invest in technological infrastructure that enables seamless use of AI tools across departments and disciplines.

f. Conduct Ongoing Research and Feedback Loops:

Given the rapid evolution of AI technologies, ongoing research on the use of ChatGPT and similar tools in education is essential. Universities should establish feedback mechanisms to regularly assess the effectiveness of AI integration in the classroom. Faculty members and students should be encouraged to share their experiences with AI tools, which can help institutions fine-tune policies and adapt training programs to meet evolving educational needs.

7. Final Thought

As AI tools like ChatGPT continue to revolutionize teaching and learning, universities need to adopt a strategic, well-balanced approach to their integration. By addressing both the

benefits and concerns raised by faculty members, institutions can ensure that AI tools are used to enhance educational outcomes without compromising academic integrity or intellectual development. The successful integration of ChatGPT into engineering education requires a collaborative effort between faculty, students, and institutional leadership to create an environment where innovation and academic rigor go hand in hand.

References:

Adel, A., Ahsan, A., & Davison, C. (2024). *ChatGPT Promises and Challenges in Education: Computational and Ethical Perspectives*. *Education Sciences*, *14*(8), 814. https://doi.org/10.3390/educsci14080814

Al-Mughairi, H., & Bhaskar, P. (2025). Exploring the factors affecting the adoption of AI techniques in higher education: insights from teachers' perspectives on ChatGPT. *Journal of Research in Innovative Teaching & Learning*, *18*(2), 232–247.

Carina Argüello, F., Martínez Banda, J. E., Isabel Chamorro, M., Bravo Jiménez, A., & Álvarez, L. (2024). Analysis of Teachers' Perception of the Use and Impact of ChatGPT in Contemporary Education. *Environmental & Social Management Journal/Revista de Gestão Social e Ambiental*, *18*(10).

Baidoo-Anuu, D. and Owusu Anash, L. (2023) Education in the era of generative artificial intelligence (AI): understanding the potential benefits pf ChatGPT in promoting teaching and learning, SSRN 4337484.

Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2023). ChatGPT and artificial intelligence in higher education: Ethical and educational perspectives. *Innovations in Education and Teaching International*, *60*(2), 115–127. https://doi.org/10.1080/14703297.2023.2190147

Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2023). ChatGPT and artificial intelligence in higher education: Ethical and educational perspectives. *Innovations in Education and Teaching International*, *60*(2), 115–127. https://doi.org/10.1080/14703297.2023.2190147

Dimeli, M., & Kostas, A. (2025). *The Role of ChatGPT in Education: Applications and Challenges: Insights from a Systematic Review*. *Journal of Information Technology Education: Research*, *24*(1),1535. https://doi.org/10.28945/5422InformingScienceInstitute+3LinkedIn+3learntechlib.org+3

Domingo Verano-Tacoronte1, ·Alicia Bolívar-Cruz1 ·Silvia Sosa-Cabrer (2025), Are University teachers ready for generative artificial intelligence? Unpacking faculty anxiety in the ChatGPT era, *Education and Information Technologies* https://doi.org/10.1007/s10639-025-13585-7

Dwivedi, Y. K., Hughes, D. L., Baabdullah, A. M., et al. (2023). So, what if ChatGPT wrote it? Multidisciplinary perspectives on the opportunities, challenges, and implications of generative conversational AI for research, practice, and policy. *International Journal of Information Management, 71*, 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642

Huallpa, J. J. (2023). Exploring the ethical considerations of using Chat GPT in University education. *Periodicals of Engineering and Natural Sciences*, *11*(4), 105-115.

Iqbal, N., Ahmed, H., & Azhar, K. A. (2022). Exploring teachers' attitudes towards using ChatGPT. *Global Journal for Management and Administrative Sciences*, *3*(4), 97-111.

Jaffar, M., et al. (2024). Behavioural intentions towards ChatGPT adoption: A TPB perspective. *Asian Journal of Digital Education, 2*(1), 15–29.

Kanwal, A., Hassan, S. K., & Iqbal, I. (2023). An investigation into how university-level teachers perceive the impact of ChatGPT on student learning. *Gomal University Journal of Research, 39*(3), 250–265. https://doi.org/10.51380/gujr-39-03-001ResearchGate

Kasneci, E., Sessler, K., Küchenhoff, H., Bannert, M., & Kasneci, G. (2023). ChatGPT for good? Opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, 102274. https://doi.org/10.1016/j.lindif.2023.102274

Khan, J., & Panhwar, F. Y. (2025). Enhancing Formal Written Communication Skills Through Mobile-Assisted Language Learning: A Quasi-Experimental Study. *Journal of Political Stability Archive*, *3*(2), 713-734.

Li, M., Enkhtur, A., Cheng, F., & Yamamoto, B. A. (2023). Ethical implications of ChatGPT in higher education: A scoping review. *arXiv preprint arXiv:2311.14378*.

Majeed, S., Khan, A. Y., Munir, M., Rafiq, F., Khan, K., & ul Shan, R. (2024). Role of generative artificial intelligence (Gen AI) in academia: University teachers' perspective within Pakistani higher education context.

Malik, M. A. (2024). Challenges and opportunities about ChatGPT in higher education: a qualitative study about university teachers in Pakistan. *Voyage Journal of Educational Studies*, *4*(2), 315-324.

Mohebi, L. (2024). Empowering learners with ChatGPT: Insights from a systematic literature exploration. *Education and Information Technologies*, *29*(1),120–145.https://doi.org/10.1007/s44217-024-00120-y SpringerLink+1ResearchGate+1

Neumann, M., Rauschenberger, M., & Schön, E. M. (2023. We need to talk about ChatGPT: The future of AI and higher education. In *2023, IEEE/ACM 5th International Workshop on Software Engineering Education for the Next Generation (SEENG)* (pp. 29–32). IEEE.

Perera, P. L., & Lankathilaka, M. A. (2023). AI in higher education: A literature review of ChatGPT and guidelines for responsible implementation. *International Journal of Research and Innovation in Social Science*, *7*(6), 306–314. https://doi.org/10.47772/IJRISS.2023.7623RSIS International+1ResearchGate+1

Qadir, J. (2023). Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education. In *2023 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1-9). IEEE.

Shah, M. H. A., Ali, Z., & Shah, A. (2024). Challenging factors towards the effective use of ChatGPT in Education in Province Sindh, Pakistan: Application of TAM Model. *International" Journal of Academic Research for Humanities"*, *4*(2), 86-94.

Terwiesch, C. (2023). Would ChatGPT3 get a Wharton MBA? *A prediction based on its performance in the operations management course*.

Ugli, A. M. B., Kamal, S. S. L. A., & Azamovna, A. M. (2025). Understanding Uzbekistan university EFL teachers' perceptions of ChatGPT: From benefits to ethical challenges. *International Journal of Information and Education Technology*, *15*(2), 246–254.

Vargas-Murillo, A. R., de la Asunción, I. N. M., & de Jesús Guevara-Soto, F. (2023). Challenges and opportunities of AI-assisted learning: A systematic literature review on the impact of ChatGPT usage in higher education. *International Journal of Learning, Teaching and Educational Research*, *22*(7), 122-135. https://doi.org/10.26803/ijlter.22.7.7ijlter+1research.upn.edu.pe+1

Wahit, F., & Rossli, M. (2024). Incorporating GPT Catboats into Interactive Learning Environments: A Systematic Literature Review. *International Journal of Academic Research in Progressive Education and Development*, *13*(3), 45–60. https://doi.org/10.6007/IJARPED/v13-i3/22838 HRmars+1ResearchGate+1

Watters, J., & Lemański, R. (2023). ChatGPT and the future of learning: Pedagogical and ethical considerations. *Computers & Education*, *194*, 104747. https://doi.org/10.1016/j.compedu.2023.104747

Zhai, X. (2022). ChatGPT: A new era of AI-powered education. *Education Technology Research and Development*, *71*(1), 1–4. https://doi.org/10.1007/s11423-022-10186-8