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Generative Artificial Intelligence in Higher Education: Understanding Faculty Adoption Through the Technology Acceptance Model

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Abstract

Generative Artificial Intelligence (AI) is increasingly transforming higher education by enhancing teaching methodologies, automating administrative tasks, and supporting research initiatives. Faculty adoption of generative AI is critical for maximizing its potential benefits, yet its acceptance remains inconsistent due to factors such as usability, perceived usefulness, and ethical concerns. This study employs the Technology Acceptance Model (TAM) to investigate the relationships between Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude (ATT), and Intention to Use (IU) among faculty in higher education. A quantitative research design was used, with data collected through an online questionnaire distributed to faculty members. The results indicate that PEOU significantly predicts PU, reinforcing the importance of usability in AI adoption. However, PU negatively influences ATT, suggesting that while faculty recognize AI's usefulness, they may have concerns regarding its implications for academic integrity and pedagogical changes. Despite this, ATT strongly predicts IU, indicating that faculty attitudes are the primary driver of AI adoption. These findings highlight the need for institutional AI training, ethical guidelines, and AI-integrated curriculum strategies to facilitate responsible adoption. Future research should incorporate qualitative insights and expand to multiple institutions to enhance generalizability.

Keywords: Generative AI, Faculty Adoption, Technology Acceptance Model (TAM2), Perceived Usefulness, Perceived Ease of Use, Higher Education, Artificial Intelligence in Education, AI Ethics, Faculty Perceptions

Introduction

Generative Artificial Intelligence (AI) technologies, characterized by the capacity to produce new content through patterns learned from extensive datasets, have increasingly gained traction in higher education settings. Lim et al. (2023) conceptualize generative AI as "technology that (i) leverages deep learning models to (ii) generate human-like content (e.g., images, words) in response to (iii) complex and varied prompts (e.g., languages, instructions, questions)" (p. 2). From creating novel materials and enhancing instructional design to streamlining research processes and administrative tasks, these tools hold promise for reshaping the academic landscape. Faculty adoption of generative AI warrants close attention, as widespread acceptance and effective implementation of these technologies may considerably influence teaching effectiveness, research innovation, and operational efficiency.

Although its potential is evident, scholarly inquiry into faculty acceptance of generative AI remains relatively nascent. Early work suggests that perceived benefits—such as reduced workload and improved content quality—correlate with more favorable faculty attitudes and a greater likelihood of adopting AI-based pedagogies. However, concerns about accuracy, ethical considerations, and the perceived undermining of human expertise present formidable obstacles to acceptance (Wingo, Ivankova, & Moss, 2017). Indeed, some educators hesitate to integrate generative AI into curricula, fearing it enables students to bypass authentic academic effort. This apprehension is substantiated by findings from Iqbal et al. (2023), who report generally negative faculty attitudes toward generative AI platforms like ChatGPT. In addition, Michael-Villareal et al. (2023) highlight apprehensions around plagiarism, academic integrity, and the potential erosion of critical thinking skills when such

technologies are used indiscriminately.

Nevertheless, recent explorations underscore the need to strike a balance between harnessing AI's capabilities and preserving the integrity of academic standards. For instance, Bowskill et al. (2025) found that structured discussions on responsible AI usage—focusing on ethics, authorship, and critical evaluation—provided faculty with a supportive space to address concerns and share strategies. This approach mitigated apprehensions about generative AI while enabling instructors to leverage its time-saving and creative benefits in teaching and academic work. Simultaneously, Michael-Villareal et al. (2023) suggest that curriculum designs incorporating generative AI must promote intellectual rigor, prompting students to engage deeply with course material rather than relying solely on automated outputs. These perspectives highlight the dual imperative of fostering an environment that respects traditional educational values and remains open to the transformative possibilities of generative AI.

Despite this uncertainty, generative AI continues to advance in higher education. Recognizing its potential benefits—from enhanced data analysis to personalized learning experiences—highlights the necessity for faculty to comprehend how to implement it effectively. Abdullah and Zaid (2023) emphasize that "Generative AI-powered tools and platforms offer the promise of enhanced data analysis, personalized learning experiences, and streamlined administrative operations" (p. 85). Integrating these tools effectively into the curriculum and broader institutional processes is becoming increasingly important. By understanding faculty perceptions and their willingness to adopt generative AI, colleges and universities can develop strong training programs, create evidence-based policies, and support innovative teaching methods. In light of these considerations, the present study employs the Technology Acceptance Model (TAM) to explore factors influencing faculty adoption of generative AI in higher education.

2. Literature Review

Generative AI, a rapidly advancing field within artificial intelligence, has garnered significant attention for its potential to revolutionize various industries, including education, healthcare, and creative arts. However, understanding the factors that influence the acceptance and adoption of generative AI technologies remains a critical area of research. The Technology Acceptance Model (TAM) provides a valuable theoretical framework for exploring these factors, particularly in the context of perceived usefulness and ease of use, which are central to predicting user acceptance of new technologies. As TAM has been extensively applied and adapted across different domains, including higher education, it offers a robust foundation for examining how users—whether students, educators, or professionals—engage with generative AI systems. This study aims to gain insight and understanding into the acceptance of generative AI technology in the classroom among educators in higher education.

2.1 Generative AI and Higher Education

While generative AI has become one of the most talked-about technologies, it is not necessarily new. According to Al-Amin et al. (2024), the "development of the Artificial Intelligence Markup Language (AIML) occurred between 1995 and 2000, centered around the principles of Pattern Recognition or Pattern Matching" (p. 2). The earliest versions of AI were Chatbots, which used input and output masks to create a user experience that mimicked a real-time conversation (Al-Amin, et al., 2024). This has evolved into generative AI platforms that generate text, images, audio, and presentations (Feuerriegel, Hartmann, & Janiesch, 2024). Tools like ChatGPT, Bard, Genesis, Co-Pilot, and Dall-E can be accessed anywhere on any device and are changing how we work and communicate.

The widespread access to generative AI has created challenges in higher education. These challenges include academic integrity and a contemporary understanding of disciplinary knowledge (Farrelly & Baker, 2023). As students increasingly utilize AI tools for assignments and research, the potential for plagiarism and misuse of AI-generated content has raised concerns about maintaining the originality and authenticity of academic work. The rapid evolution of AI technology necessitates a re-evaluation of traditional curricula, ensuring that educational institutions adapt to incorporate the ethical and practical implications of AI in their disciplines. Shah (2023) stated, "Educators must learn what AI is, how students are using and can use it, how it can make their lives easier, and how pedagogical goals that once seemed impossible can now be reached" (p. 2).

Educators are now tasked with fostering critical thinking and creativity and guiding students in the responsible and effective use of AI, balancing innovation with preserving academic standards. The prevalence of AI in all aspects of students' lives will require them to have the skills and knowledge to use AI effectively and ethically (Shah, 2023). Therefore, educators who embrace and accept AI will be better equipped to provide the knowledge and guidance students need when navigating the use of AI academically and professionally.

In addition to the challenges of academic integrity, the integration of generative AI into higher education presents significant implications for teaching practices and the broader educational framework. Feuerriegel et al. (2024) highlight that the pervasive use of generative AI can disrupt traditional pedagogical methods, necessitating educators to rethink how they assess student learning and engagement. The ability of AI to produce sophisticated written content, often indistinguishable from human-generated work, forces institutions to reconsider the validity and reliability of conventional assessment tools such as essays and reports. Farrelly and Baker (2023) further emphasize that educators must develop new strategies to integrate AI to enhance learning without compromising educational standards. This involves creating AI-aware curricula that address the technological aspects and consider the ethical, social, and cognitive dimensions of AI use in academic settings. As a result, higher education is at a crossroads where the successful incorporation of generative AI requires a balance between embracing technological advancements and preserving the core values of academic integrity and critical thinking.

2.2 AI and Faculty Perceptions in Higher Education

Integrating generative AI into higher education has sparked diverse faculty reactions, ranging from enthusiasm for its potential to concerns about ethical implications and academic integrity. Faculty perceptions of AI play a critical role in determining the extent to which these technologies are adopted in teaching, research, and administrative functions. While some educators view AI as a tool for enhancing efficiency and personalization, others fear its impact on student learning, plagiarism, and the devaluation of human expertise (Vera, 2023; Michael-Villareal et al., 2023). Bowskill et al. (2025) highlight that structured discussions around AI usage—particularly those addressing ethics, authorship, and critical evaluation—help faculty navigate these concerns. Their study found that providing educators with dedicated spaces for open dialogue fosters informed decision-making and greater confidence in leveraging AI's benefits while mitigating risks associated with misuse or misunderstanding.

Furthermore, Bowskill et al. (2025) emphasize that faculty development programs incorporating iterative discussions on generative AI can transform initial apprehension into strategic adoption. Their research found that when educators engage in collaborative learning environments that explore AI's capabilities and limitations, they become more adept at integrating these tools effectively into their pedagogy. By framing AI as a complement rather than a replacement for human expertise, structured dialogues empower faculty to establish guidelines for ethical usage, encourage critical engagement among students, and harness AI's potential for streamlining administrative tasks, content creation, and personalized learning experiences.

2.2.1 Faculty Skepticism and Ethical Concerns

One of the primary barriers to AI adoption among faculty is skepticism regarding its accuracy, reliability, and ethical implications. Vera (2023) found that many educators perceive AI-generated content as mechanical and lacking critical thinking—an essential skill in higher education. Concerns over plagiarism and student misuse of AI tools such as ChatGPT have also fueled reluctance to integrate AI into curricula. Michael-Villareal et al. (2023) highlight that faculty members worry that AI will undermine traditional assessment methods, making evaluating students' genuine understanding and writing skills harder.

Further complicating faculty acceptance is the lack of transparency in AI-generated outputs. Unlike traditional search engines or human-generated content, generative AI models often produce responses without transparent sourcing or citation mechanisms, raising concerns about misinformation and

academic dishonesty (Farrelly & Baker, 2023). These ethical dilemmas reinforce the need for institutional policies that define AI's appropriate use in academic settings.

2.2.2 Perceived Benefits and Potential for Teaching Enhancement

Despite these concerns, other faculty members acknowledge AI's potential to revolutionize higher education by automating administrative tasks, improving content delivery, and supporting student learning. Abdullah and Zaid (2023) argue that AI-powered tools can provide personalized feedback, assist in grading, and generate customized learning materials, allowing educators to focus more on mentoring and interactive instruction. AI also offers new opportunities for data-driven decision-making, helping faculty tailor lessons based on student performance analytics (Shah, 2023).

The benefits of AI adoption appear to be discipline-dependent. Faculty in STEM fields are more likely to view AI positively due to its applications in coding, simulations, and data visualization. Research indicates that faculty in STEM fields tend to have more positive attitudes toward artificial intelligence (AI) compared to their non-STEM counterparts. For instance, a study by Ayanwale and Sanusi (2023) found that STEM teachers exhibited slightly stronger attitudes toward AI than non-STEM teachers. Similarly, Agathursamy (2024) found that disciplinary background significantly influences faculty adoption decisions regarding AI tools, with STEM faculty exhibiting more favorable attitudes toward AI integration in education and research. In contrast, faculty in humanities and social sciences often express more significant concerns about academic integrity and originality in written work (Feuerriegel et al., 2024). This suggests that AI adoption strategies should be discipline-specific, aligning with each field's unique needs and challenges.

2.2.3 The Role of Institutional Support in Faculty Adoption

The institutional guidance and training level significantly influence faculty perceptions of AI. Studies indicate that faculty who receive AI-related professional development are more likely to adopt AI-driven tools and integrate them effectively into their pedagogy (Ahmed, Ahmed, & Azhar, 2023). Conversely, institutions that fail to provide clear guidelines on AI use leave faculty uncertain, reinforcing hesitancy and resistance.

Shah (2023) emphasizes that institutional policies must address faculty concerns about academic integrity while promoting AI's responsible use. Universities implementing AI training workshops, ethical guidelines, and AI-aware curricula report higher faculty confidence in integrating these technologies into their classrooms (Farrelly & Baker, 2023). This underscores the importance of institutional leadership in shaping faculty attitudes toward AI.

While prior research has examined AI adoption in education, studies on faculty perceptions remain limited. This review highlights concerns about AI's impact on academic integrity and demonstrates its potential for enhancing teaching efficiency. By applying TAM, this study aims to bridge the gap between faculty skepticism and AI's transformative potential.

2.3 Technology Acceptance Model

The Technology Acceptance Model (TAM) is a theoretical framework that explains and predicts user acceptance of information technology. Developed by Fred Davis in 1986 as part of his doctoral dissertation at MIT, the model is rooted in the belief that the perceived usefulness and perceived ease of use when adopting technology are fundamental determinants of its acceptance. Perceived usefulness refers to the degree to which a person believes that using a particular system would enhance their job performance, while perceived ease of use denotes the degree to which a person believes that using the system would be free of effort. The model posits that these perceptions influence attitudes toward using the technology, affecting the intention to use it and, ultimately, the actual usage (Davis F. D., 1989).

TAM has been widely applied and extended in various contexts, reflecting its robustness and adaptability. Over the years, researchers have expanded the model to include additional factors influencing technology acceptance, such as social influence, facilitating conditions, and system design features. These modifications have led to various iterations, such as TAM2 and the Unified Theory of Acceptance and Use of Technology (UTAUT), incorporating elements from other behavioral theories to enhance predictive power and contextual relevance. Constructs such as subject norms extend TAM

to include the influence of one's social environment on behavioral intention (Davis & Venkatesh, 2000). TAM remains a critical tool in assessing new technologies, helping developers and researchers understand the factors contributing to successful technology adoption, and guiding the design of user-friendly systems that align with user needs and preferences (Venkatesh, Morris, Davis, & Davis, 2003).

The relevance of the TAM in research underscores its robustness as a theoretical framework, particularly in the face of rapidly advancing technologies. Researchers have continued to refine and adapt TAM to accommodate emerging technological trends, such as mobile applications, e-learning platforms, and generative AI. For example, Butler-Lamar et al. (2016) highlighted the model's adaptability in assessing mobile technology acceptance among college students, indicating its broad applicability across different user demographics and technology types. Additionally, Fador (2014) points out that integrating innovation diffusion theory with TAM provides a more nuanced understanding of how novel technologies are adopted, mainly when these technologies introduce significant changes to users' work processes or daily routines. This adaptability and expansion of TAM have made it an essential tool for predicting technology adoption and informing the design of systems that align with user expectations and needs (Dang & Naresh, 2022). As technology evolves, TAM remains a foundational model that guides academic inquiry and practical application, ensuring that innovations are valuable and accessible to their intended users. TAM's evolution and sustained relevance highlight its critical role in bridging the gap between technological innovation and user acceptance, making it indispensable in developing and deploying emerging technologies.

This study used the TAM as the theoretical model, which involved perceived ease of use, perceived usefulness, attitude toward using, and intention to use, as illustrated in Figure 1.

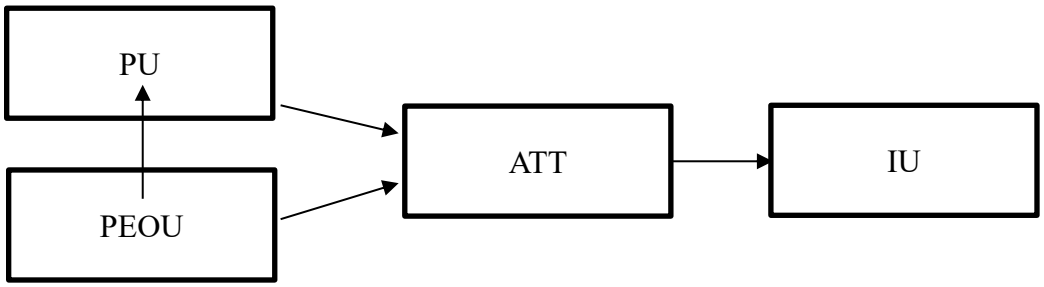

Figure 1. TAM Framework for Faculty Adoption of Generative AI

3. Research Method and Design

The quantitative research methodology was selected for this study to examine the acceptance of technology among faculty regarding generative AI. This research effort aims to explore the technological acceptance of generative AI among faculty in higher education. The quantitative methodology was chosen because statistical data analysis, such as Path Analysis, can provide valuable insights, potentially revealing significant factors influencing technology adoption of generative AI in higher education. This research utilized quantitative data from full-time and part-time faculty across all academic departments at Seminole State College of Florida (SSC) to determine faculty technology acceptance of AI technologies.

3.1 Research Questions Related to TAM Constructs

RQ1. As measured by TAM, does perceived ease of use positively influence the perceived usefulness of generative AI among faculty?

RQ2. As measured by TAM, does perceived ease of use positively influence attitude toward generative AI among faculty?

RQ3. As measured by TAM, does perceived usefulness positively influence attitude toward generative AI among faculty?

RQ4. As measured by TAM, does attitude positively affect the intention to use generative AI among faculty?

3.2 Hypotheses Related to TAM Constructs

H1. Perceived Ease of Use (PEOU) will positively influence generative AI's perceived usefulness (PU).

H2. Perceived ease of use (PEOU) will positively influence the faculty's attitude (ATT) toward generative AI.

H3. Perceived usefulness (PU) will positively influence the faculty's attitude (ATT) toward generative AI.

H4. Attitude (ATT) will influence faculty intention to use (IU) generative AI.

3.3 Data Collection and Analysis

3.3.1 Data Collection

A structured questionnaire was developed and administered to all full-time and part-time faculty members of Seminole State College of Florida (SSC) through the Zoho Survey platform. This questionnaire began with general questions regarding each participant's department, employment status, academic position, and past use of AI in education. The faculty completed the online questionnaire using scales designed for TAM (Lamar et al., 2016). The TAM scales are recognized for measuring end-user satisfaction with technology (Edmunds et al., 2012). The scales used for the study are perceived ease of use, perceived usefulness, attitude, and intention of use. The resulting data was used to analyze faculty perspectives on AI-related tools in higher education.

3.3.2 Participants

Out of 557 invited participants, 64 faculty members participated in the study, resulting in an 11.5% response rate. While the response rate is relatively low, it falls within acceptable ranges for survey research in higher education settings. The participants represented a diverse sample of faculty members with varying experience levels and familiarity with generative AI, offering valuable insights into technology adoption within academia.

The sample included faculty members from various academic ranks and employment statuses. Among the participants, 7.8% were assistant professors, 21.9% were associate professors, and 57.8% were full professors. Additionally, 60.7% of respondents were full-time faculty members, while 39.3% were part-time faculty members.

3.3.3 Analysis

The results were analyzed using linear regression analysis in SPSS to investigate the TAM constructs. This path analysis and regression analysis approach facilitated the development of a model depicting the relationships among the four factors under study: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude (ATT), and Intention to Use (IU). A linear regression analysis was conducted to assess the influence of each factor on the others using the proposed hypotheses. This model examines how Perceived Ease of Use and Perceived Usefulness influence faculty attitude and how attitude influences faculty members' Intention to Use generative AI in higher education.

4. Results

Four variables based on the Technology Acceptance Model (TAM) were measured. Table 1 shows the descriptive statistics for TAM 2 variables for all faculty. The means for the TAM variables of PU and PEOU were 2.69 and 2.61, with standard deviations of 0.72 and 1.06, respectively. The means for ATT and IU were 3.30 and 3.19, with standard deviations of 1.12 and 1.12, respectively.

Table 1. Descriptive Statistics for TAM Variables

Variables	Mean	Standard Deviation
Perceived Usefulness (PU)	2.69	0.72
Perceived Ease of Use (PEOU)	2.61	1.06
Attitude (ATT)	3.30	1.12
Intention to Use (IU)	3.19	1.11

4.1 Reliability Statistics

Cronbach's Alpha for the TAM variables is represented in Table 2. The Cronbach's Alpha for the TAM variables for all faculty ranges from 0.689 for perceived ease of use (PEOU) and 0.953 for attitude (ATT).

Table 2. Cronbach's Alpha for TAM Variables

Variables	Cronbach's Alpha
Perceived Usefulness (PU)	0.924
Perceived Ease of Use (PEOU)	0.689
Attitude (ATT)	0.953
Intention to Use (IU)	0.946

4.2 Hypothesis Testing

4.2.1 Hypothesis 1: Perceived Ease of Use and Perceived Usefulness

The hypothesis (H1) stated that perceived ease of use would positively influence the perceived usefulness of generative AI among faculty. As indicated in Table 3, the model was statistically significant, $F(1,62) = 19.45$, $p<0.001$, indicating that PEOU significantly predicts PU. The results showed a positive relationship between PEOU and PU ($B=0.731$, $t=4.410$, $p<0.001$), meaning that faculty members who perceive generative AI as easy to use are more likely to find it useful. The model explained 23.9% of the variance in PU ($R^2 = 0.239$), suggesting a moderate effect size.

This relationship is further illustrated in Figure 2, which presents a box plot of PEOU and PU. The plot demonstrates a general trend where higher PEOU scores correspond with higher median PU scores, supporting the positive association found in the regression analysis. Therefore, linear regression analysis supported this hypothesis (H1).

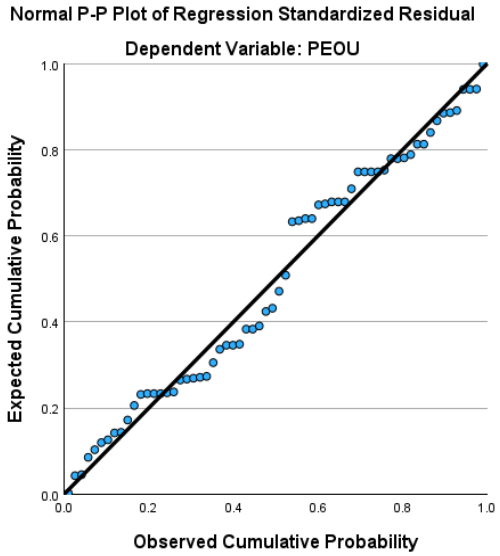

Figure 2. Box Plot of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU)

4.2.2 Hypothesis 2: Perceived Ease of Use and Attitude

The hypothesis (H2) stated that perceived ease of use positively influences faculty's attitude toward generative AI. As indicated in Table 3, the results indicated that PEOU did not significantly predict ATT ($B = 0.177$, $t(62) = 0.887$, $p = 0.379$). The model accounted for only 1.3% of the variance in ATT ($R^2 = 0.013$), suggesting that PEOU is not a meaningful predictor of faculty attitude toward generative AI.

As depicted in Figure 3, the PEOU and ATT box plot shows no clear pattern, reinforcing the statistical findings. The median ATT scores appear relatively stable across different levels of PEOU, indicating that faculty attitudes may be influenced by other factors beyond ease of use. Therefore, linear regression analysis does not support the hypothesis (H2).

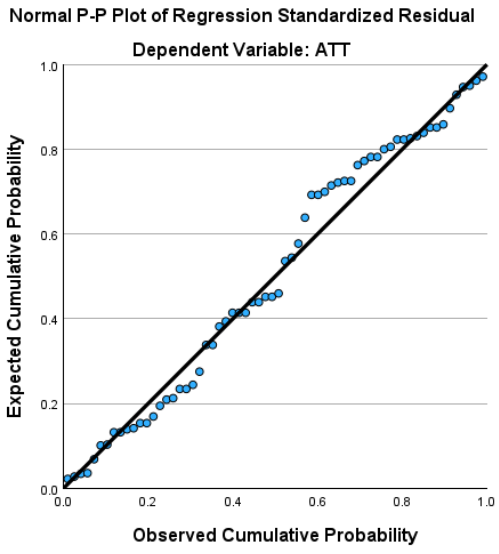

Figure 3. Box Plot of Perceived Ease of Use (PEOU) and Attitude (ATT)

4.2.3 Hypothesis 3: Perceived Usefulness and Attitude

The hypothesis (H3) stated that perceived ease of use positively influences faculty's attitude toward generative AI. As indicated in Table 3, the regression model was statistically significant, $F(1,62) = 12.10$, $p = 0.001$, indicating that PU significantly affects ATT. However, contrary to expectations, the relationship was negative ($B=-0.428$, $t=-3.479$, $p=0.001$), suggesting that an increase in Perceived Usefulness (PU) was associated with a decrease in Attitude (ATT) toward generative AI. The model explained 16.3% of the variance in ATT ($R^2 = 0.163$), indicating that while PU plays a role in shaping faculty attitudes, its effect is in the opposite direction than hypothesized.

This unexpected relationship is visually represented in Figure 4, which shows a box plot of PU and ATT. The plot reveals a downward trend in ATT as PU increases, reinforcing the negative regression coefficient. Therefore, linear regression analysis does not support the hypothesis (H3).

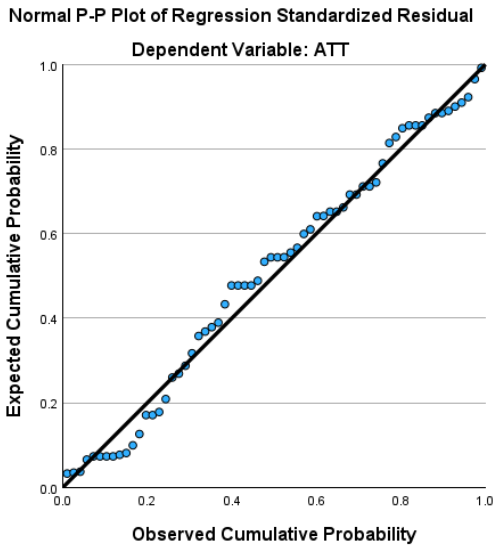

Figure 4. Box Plot of Perceived Usefulness (PU) and Attitude (ATT)

4.2.4 Hypothesis 4: Attitude and Intention to Use

The hypothesis (H4) stated that attitude positively influences faculty's intention to use generative AI. As indicated in Table 3, the regression analysis revealed a statistically significant positive relationship between ATT and IU ($B = 0.897$, $t(62) = 16.270$, $p < 0.001$), explaining 81% of the variance in IU ($R^2 = 0.810$). The positive coefficient suggests increased ATT leads to a higher intention to use generative AI.

As shown in Figure 5, the box plot of ATT and IU further illustrates this strong association. Faculty members with higher ATT scores consistently exhibit higher IU scores, demonstrating a clear positive trend. This visual confirmation reinforces the regression findings. Therefore, linear regression analysis supported hypothesis (H4).

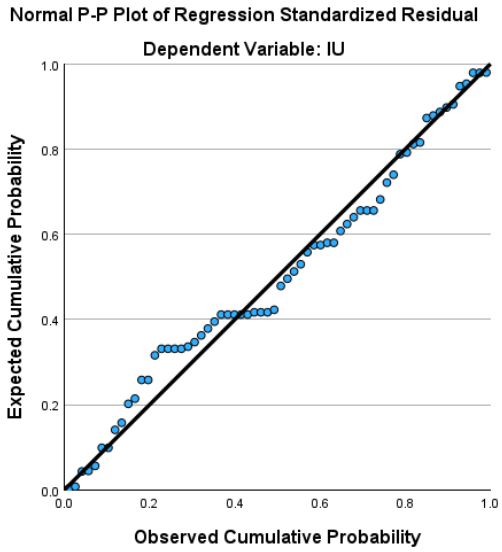

Figure 5. Box Plot of Attitude (ATT) and Intention to Use (IU)

Table 3. Hypothesis Testing Results

Hypothesis	Path		Coefficient	t-value	p-value
H1	PEOU	→ PU	0.731	4.41	<0.001
H2	PEOU	→ ATT	0.177	0.887	<0.379
H3	PU	→ ATT	-0.428	-3.479	<0.001
H4	ATT	→ PU	0.897	16.27	<0.001

5. Discussion

This study examined the relationships between Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude (ATT), and Intention to Use (IU) generative AI among faculty members at Seminole State College (SSC). Out of 557 faculty members invited to participate, 64 responded, resulting in a response rate of 11.5%. Although this response rate limits the generalizability of the findings, it still provides valuable insights into faculty perceptions regarding generative AI, particularly concerning ease of use, usefulness, attitudes, and their intention to use the technology. Research suggests low response rates in academic surveys, particularly those targeting faculty, can impact generalizability and introduce nonresponse bias (Radhakrishna & Doamekpor, 2008). However, despite the relatively low participation, prior studies indicate that survey-based research on faculty adoption of educational technology remains insightful even with moderate response rates (Dillman et al., 2014).

The results offered partial support for the hypothesized relationships. It was found that PEOU significantly influenced PU (H1 supported) but did not significantly predict ATT (H2 not supported). Additionally, contrary to expectations, PU negatively influenced ATT (H3 rejected), while ATT had a strong positive influence on IU (H4 strongly supported). These findings indicate that while perceived ease of use contributes to perceptions of usefulness, other factors play a significant role in shaping faculty attitudes and intentions to utilize generative AI (Venkatesh & Bala, 2008). The significant correlation between PEOU and PU is consistent with the Technology Acceptance Model (TAM), suggesting that faculty members view generative AI as more beneficial when it is easier to use. This aligns with prior research, which confirms that accessibility and usability are key components in technology adoption within academic environments (Davis, 1989; Edmunds, Thorpe, & Conole, 2012). However, the lack of a significant influence from PEOU on ATT suggests that faculty may assess the

usefulness of generative AI independently of its usability, which is consistent with research showing that additional factors—such as ethical considerations, institutional policies, and previous experiences with AI technologies—shape faculty attitudes (Cardona et al., 2023).

One of the more surprising findings was the negative relationship between PU and ATT, which contradicts conventional TAM assumptions that posit a positive impact of usefulness on attitudes toward technology (Venkatesh et al., 2003). This unexpected result suggests that while faculty recognize the potential usefulness of generative AI, they may also perceive it as a threat to academic integrity, job security, or traditional teaching methods (Michael-Villareal et al., 2023). The automation of grading, content creation, and personalized learning raises concerns about job displacement and uncertainty in teaching roles, especially if faculty autonomy in assessment is diminished (Farrelly & Baker, 2023). Additionally, redesigning course content and adapting to AI-enhanced instruction may be perceived as a burden, particularly in the absence of clear institutional policies and support structures (Shah, 2023). Studies in other technology adoption contexts confirm that PU can negatively impact attitudes when users feel that adoption is complex, disruptive, or forced (Balaskas et al., 2025). This suggests that faculty attitudes toward generative AI may be influenced by broader concerns about its effects on the foundational values of higher education rather than its technical usefulness alone. Future research should investigate whether perceived control, trust, and ethical concerns mediate this relationship (Feuerriegel et al., 2024).

Despite the unexpected correlation between PU and ATT, ATT emerged as the strongest predictor of IU, accounting for 81% of the variance in the intention to adopt generative AI. This finding reinforces prior research demonstrating that faculty members' intentions to engage with new technology are primarily shaped by their overall attitudes rather than by perceived usefulness or ease of use alone (Park, 2009). In educational technology adoption studies, attitude consistently emerges as the most significant predictor of behavioral intent, outweighing perceived usefulness (Fathema, Shannon, & Ross, 2015). Given this strong relationship, initiatives to enhance faculty attitudes toward generative AI—such as professional development programs, AI literacy training, and institutional support—are crucial for promoting AI adoption in academic settings (Ahmed, Ahmed, & Azhar, 2023). These results underscore the importance of addressing faculty concerns, fostering positive perceptions, and developing clear institutional policies to facilitate the effective integration of AI into higher education (Harvard.edu, 2024).

6. Limitations and Future Directions

This study faced several limitations. First, it was conducted at a single institution within the Florida State College system comprising 28 state colleges. This scope restricts the generalizability of the findings related to the Technology Acceptance Model (TAM) and AI adoption. To enhance external validity, it is important to note that the results are derived from data collected at a single institution, SSC, with a low response rate of 11.5%. Although this response rate is generally acceptable for survey-based research in higher education, it restricts the applicability of the findings to broader faculty populations across various institutional contexts. A multi-institutional study that includes faculty from diverse types of institutions (e.g., research universities, community colleges, private colleges) would yield a more comprehensive understanding of faculty adoption of generative AI. Furthermore, response bias must be taken into account, as faculty members who are more favorable toward AI or more technologically inclined may have been more inclined to participate in the study, potentially skewing the results toward a more positive view of AI adoption. Future research should focus on strategies to increase participation rates and ensure a more diverse faculty sample to provide a balanced representation of perspectives on AI adoption in higher education.

This study examined key constructs of the Technology Acceptance Model (TAM), including Perceived Ease of Use, Perceived Usefulness, Attitude, and Intention to Use. However, additional contextual factors may also play a significant role in faculty adoption of generative AI. Variables such as prior experience with AI tools, subjective norms (influences from peers and the institution), and perceived ethical concerns should be considered in future research to provide a more comprehensive understanding of AI acceptance in academia.

The reliance solely on quantitative survey data in this research captures broad trends but may fail to

reveal deeper motivations, concerns, and contextual influences affecting faculty adoption of AI. Future studies should incorporate qualitative methods, such as in-depth interviews, focus groups, or open-ended survey questions, to better explore faculty perceptions, barriers, and institutional influences. Employing a mixed-methods approach would yield richer insights into the nuances of AI adoption that quantitative data alone may not fully capture. By addressing these limitations and integrating qualitative perspectives, forthcoming research can develop a more holistic framework for understanding AI adoption in higher education, ultimately guiding institutions in effectively supporting and encouraging faculty engagement with AI technologies.

7. Conclusions and Recommendations

Generative AI has profoundly transformed the landscape of higher education and is poised to continue its evolution, becoming increasingly ingrained within the fabric of colleges and universities. Faculty members can harness generative AI to streamline various academic tasks, including the creation of assignments and rubrics, automated grading processes, and the generation of personalized content tailored to student needs. This technological advancement promises not only to enhance educational efficiency but also to spur innovation in teaching methodologies (Tiffin University, 2024).

However, the widespread integration of generative AI is contingent upon faculty perceptions, which are influenced by their perceived ease of use (PEOU), perceived usefulness (PU), and overall attitude (ATT) toward the technology. Insights from the Technology Acceptance Model (TAM) reveal that while PEOU significantly forecasts PU, an intriguing dynamic exists where PU appears to negatively affect ATT. This suggests that educators may recognize the potential benefits of AI tools yet remain apprehensive about issues such as academic integrity, job security, and ethical dilemmas (Farrelly & Baker, 2023; Vera, 2023).

To facilitate the successful adoption of generative AI, higher education institutions should proactively invest in robust AI literacy training and comprehensive professional development programs. These initiatives should emphasize the advantages of AI technologies as well as the importance of their responsible implementation within educational contexts. Research indicates that faculty who engage in AI-specific training and receive robust institutional support are more inclined to seamlessly integrate AI tools into their teaching practices (Ahmed, Ahmed, & Azhar, 2023). Furthermore, universities would benefit from establishing clear policies surrounding AI ethics, academic integrity, and the responsible use of AI. Such frameworks will empower faculty to utilize AI confidently, ensuring their methods align with educational values and ethical standards (Harvard University, 2024).

Future investigations into this domain should adopt a mixed-methods approach, blending quantitative studies with rich qualitative data derived from faculty interviews and focus groups. This strategy will enable a deeper exploration of the motivations, concerns, and barriers that influence AI adoption among educators. While TAM-based studies yield valuable numerical insights, qualitative research is essential to capturing the intricate nuances of faculty perceptions and the complexities of their decision-making processes regarding AI (Park, 2009). Broadening research efforts to encompass multiple institutions will enhance the generalizability of findings and provide a comprehensive understanding of AI adoption trends across higher education landscapes.

Ultimately, it is crucial for institutions to devise AI-inclusive curriculum strategies that effectively balance innovation with academic integrity. Faculty members must be supported in their endeavors to integrate AI into pedagogically sound practices that promote critical thinking, ethical AI use, and meaningful engagement with course content. By taking these thoughtful and strategic steps, colleges and universities can leverage AI as a powerful tool to enrich education while addressing faculty concerns, fostering a forward-thinking environment that encourages the responsible adoption of AI technologies in higher education.

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