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Determinants of the Intention to Use ChatGPT in the Work of University Lecturers

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Research Article

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Abstract

Background/purpose. The introduction of ChatGPT has rapidly transformed various aspects of life. It has raised concerns about its impact on current jobs, especially in education. The study aims to examine the factors that may influence university lecturers' intention to adopt ChatGPT in their work.

Materials/methods. This study uses the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model and proposes new components to examine the factors. The data was collected from 460 lecturers working in various universities in Hanoi, Vietnam.

Results. The results have identified that Performance Expectancy has the most significant positive impact, followed by Personal Innovativeness, Effort Expectancy, Social Influence, and Image. On the other hand, facilitating conditions and insecurity negatively affect the intention to use, while hedonic motivation has no impact. The results also highlight the moderating effect of Information Accuracy on the relationships between some of these factors and the Intention to Use.

Conclusion. The study extends the UTAUT2 model through the integration of novel constructs and provides insights into optimizing and enhancing the use of AI in the academic environment.

1. Introduction

In the contemporary digital era, characterized by continuous advancements in artificial intelligence (AI), chatbots are progressively permeating diverse facets of human existence (Menon & Shilpa, 2023). Within the educational domain, AI demonstrates particular promise in transforming pedagogical paradigms and revolutionizing teaching-learning processes (Ifenthaler & Schumacher, 2023; Foroughi et al., 2023). This perspective garners substantial scholarly support; researchers including Dwivedi et al. (2023), Rudolph et al. (2023), and Bahadur et al. (2024) concur that AI is fundamentally reshaping higher education, with tools such as ChatGPT (Chat Generative Pre-Trained Transformer) redefining student learning methodologies, instructional approaches, and assessment practices. Recognizing this significance, there has been a proliferation of research examining AI applications in education (Haenlein & Kaplan, 2020; Bahadur et al., 2024).

Launched in 2020 by OpenAI, ChatGPT marked a significant milestone in conversational AI, utilizing sophisticated deep learning algorithms to analyze and generate human-like text. This system provides comprehensive answers to complex questions, offering rapid and efficient access to essential information (Menon & Shilpa, 2023). Recent empirical studies have demonstrated the substantial benefits of ChatGPT in supporting teaching and learning at the university level (Abbas et al., 2022; Pillai et al., 2023). With its adaptive learning capabilities and ability to evolve over time, ChatGPT enhances accessibility, efficiency, and the quality of learning for learners worldwide (Mijwil et al., 2023; Nazaretsky et al., 2022; Foroughi, 2023).

ChatGPT has further proven its value in academic contexts, including its ability to improve scientific language use, particularly in terms of text conciseness, grammatical accuracy in English, and language translation (Graf & Bernardi, 2023). Additionally, it has shown potential in supporting researchers in various ways, such as designing experimental procedures, analyzing and interpreting data, drafting manuscripts, generating hypotheses and research questions, and developing research methodologies (Dergaa et al., 2023; Sok & Heng, 2024). These findings highlight the significant transformative potential of ChatGPT across the educational landscape.

Despite its early contributions, ChatGPT remains relatively new, and studies investigating its use and the factors influencing the intention to adopt ChatGPT in educational contexts are still limited (Lund & Wang, 2023; Taecharungroj, 2023; Bahadur, 2024). Prior research has predominantly focused on examining the factors affecting students' intention to use ChatGPT (Abbas et al., 2022; Foroughi et al., 2023; Mijwil & Aljanabi, 2023; Strzelecki, 2023; Williamson et al., 2023; Bahadur, 2024), mainly overlooking the perspective of faculty regarding the acceptance and application of ChatGPT in their professional tasks. Existing literature on faculty primarily explores the technical efficiency of ChatGPT in assessment contexts but fails to adequately address the factors influencing their intention to adopt the tool.

This study employs the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh et al., 2012) to examine the determinants of faculty members' intention to use ChatGPT. As a contemporary framework, UTAUT2 is well-suited for analyzing modern technology trends such as AI adoption intentions (Venkatesh et al., 2012, 2016). This study customizes and expands the UTAUT2 model to align with the unique context of faculty members. Specifically, the study incorporates an additional factor, Insecurity, into the model.

A notable focus is the role of insecurity, which, amidst the AI boom, can lead to concerns regarding academic integrity, plagiarism (Cotton et al., 2024), over-reliance on AI (Crawford et al., 2023; Jarrah et al., 2023; Sok & Heng, 2023, 2024), and even information security breaches. These concerns pose significant barriers to technology adoption in educational settings.

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Furthermore, Personal Innovativeness is integrated into the model as prior studies suggest that individual innovation is a critical factor influencing the acceptance of new technologies (Chen, 2021; Alduraywish et al., 2022; Bahadur, 2024). Additionally, Image emerges as an essential determinant in technology acceptance processes. Empirical evidence indicates that the aspiration to enhance professional image within the community is a powerful motivator for adopting and using innovations (Rogers, 1983; Moore & Benbasat, 1991). In academic contexts, this aspect is particularly critical, as hesitation in adopting modern technologies like ChatGPT may undermine professional credibility and teaching efficacy within the scholarly community.

While ChatGPT demonstrates remarkable advantages in providing rapid and comprehensive responses to complex queries (OpenAI, 2024), it raises significant concerns about Information Accuracy – an issue not unique to ChatGPT but to AI in general (Karakose et al., 2023; Zhuo et al., 2023). For faculty members who frequently engage with specialized knowledge domains, the reliability of information becomes a critical factor in their decision to adopt technology. This raises two essential research questions: Does information accuracy directly influence faculty members' intention to use ChatGPT, and does it act as a moderating variable in the relationships between other determinants?

In recognition of these multifaceted considerations, this investigation aims to examine the **"Determinants of the Intention to Use ChatGPT in the Work of University Lecturers".** Through systematic analysis of these factors, this research seeks to provide empirically grounded insights for optimizing AI integration in educational contexts, supporting faculty professional development, and advancing educational innovation objectives within Vietnam's higher education landscape. The findings hold significant implications for institutional policy development, professional development programming, and strategic technology integration initiatives in higher education.

2. Literature Review

2.1. Theoretical Framework

This study utilized the UTAUT2 model to explain university lecturers' intention to use ChatGPT. UTAUT2 is recognized as a robust adoption framework with strong explanatory power (Cabrera-Sánchez et al., 2020; Strzelecki, 2024). Proposed by Venkatesh et al. (2012) as an extension of the original UTAUT model, UTAUT2 builds on the foundation of UTAUT, which explains user behaviour through four key constructs: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. These constructs are valuable for analysing and understanding the adoption of information technology within organizations (Venkatesh et al., 2003).

Venkatesh et al. (2012) extended the UTAUT model by incorporating three new constructs: Hedonic motivation, Price Value, and Habit – widen the scope and generalizability of UTAUT from an organizational to a consumer context. UTAUT2 is a robust theoretical model designed to comprehend the determinants that affect individuals' adoption and use of new technologies in organizational and personal contexts (Tamilmani et al., 2021). UTAUT2, which was developed through a great deal of empirical research, offers a comprehensive framework that helps practitioners and researchers discover important factors influencing the acceptance and use of technology (Strzelecki, 2024). The UTAUT2 model is used in higher education to determine what factors influence students' or teachers' intentions to use various technology tools, including learning management software (Alotumi, 2022; Jakkaew & Hemrungrote, 2017; Kumar & Bervell, 2019), immersive virtual and augmented reality (Bower et al., 2020; Faqih & Jaradat, 2021), mobile applications (Ameri et al., 2020; Kang et al., 2015), and e-learning systems (Raza et al., 2022).

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Our study argues that Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Hedonic Motivation may significantly affect lecturers' Intention to use ChatGPT in an academic context.

Furthermore, we suggested extending the well-established UTAUT2 theory by incorporating Image, Personal Innovativeness, Insecurity and Information Accuracy as direct influences on Intention to use ChatGPT. Additionally, we suggested that Information Accuracy moderates the influence of UTAUT2 determinants on the Intention to Use ChatGPT. The Image could be incorporated as a key predictor of behavioural intention in technology acceptance models, particularly in contexts where the choices that consumers make are public and subject to judgments from the members of the community (Lampo & Silva, 2022). We included the Image construct to examine university lecturers' intention to use technology when they are motivated by their community to improve their image and social status (Moore & Benbasat, 1991; Venkatesh & Davis, 2000; Lampo & Silva, 2022). Personal innovativeness (PI) has been recognized as a significant factor that influences technology adoption and usage (Agarwal & Prasad, 1998). Personal innovativeness exhibits an individual's propensity to experiment with and implement new IT developments independently and is considered a stable and context-specific trait that significantly impacts the acceptance and adoption of IT (Dajani & Abu Hegleh, 2019; Twum et al., 2022). Or concerns about plagiarism or over-reliance on AI (Črček & Patekar, 2023; Putra et al., 2023) mentioned in Insecurity are also factors influencing the intention to adopt a new technology. Additionally, prior studies on chatbots have identified Information Accuracy as a key driver for chatbot use (Chung et al., 2020; Lin et al., 2023) and moderate the influence of UTAUT2 determinants on the Intention to Use ChatGPT, with lack of accuracy potentially offsetting these effects (Foroughi et al., 2023). Therefore, this study posited that information accuracy may positively influence Intention to Use ChatGPT and moderate the influence of UTAUT2 determinants on the Intention to Use ChatGPT.

2.2. Proposed model and hypotheses

2.2.1. Performance Expectancy

Performance expectancy refers to "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003). This factor reflects the belief that new technology can improve work efficiency, driving user adoption (Chakava et al., 2018; Foroughi et al., 2023). Numerous studies have shown that individuals are more likely to use technology when they believe it will enhance their performance (Anthony et al., 2021; Foroughi et al., 2023).

In education, performance expectancy is widely recognized as a key predictor of the acceptance and application of educational technologies (Al-Emran et al., 2023; Rahim et al., 2022; Foroughi et al., 2023). Specifically, ChatGPT has gained significant attention for its capacity to autonomously generate textual information on a diverse range of topics, thereby substantially reducing the time users invest in information retrieval from multiple sources. In this research, university lecturers are expected to actively use ChatGPT for academic purposes if they believe this tool can help them and their students complete academic tasks quickly, while also improving learning performance, productivity, and work efficiency. Therefore, we propose that:

H1: Performance Expectancy Positively Affects Intention to Use ChatGPT

2.2.2. Effort Expectancy

Effort Expectancy refers to the degree of ease associated with using an information system and plays a significant role in shaping the intention to adopt new technology (Venkatesh et al., 2003). When users perceive a technology as easy to use, they are more likely to accept and integrate it into their daily activities, encompassing both mandatory and voluntary contexts (Chong et al., 2022).

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Alyoussef (2022) emphasized that minimizing the effort required to use a technology can significantly enhance the likelihood of its adoption.

In education, Zhao et al. (2021) highlighted that faculty members value teaching tools like ChatGPT when they are easy to use and require minimal technical skills. Camilleri (2024) argued that easy integration into daily tasks is crucial for encouraging ChatGPT adoption among users, which in turn fosters wider AI use in education. The study by Menon and Shilpa (2023) found that effort expectancy significantly influences the intention to use ChatGPT, especially among younger users who value the technology's quick responsiveness and user-friendly interface. This finding is consistent with the perspectives of Davis (1989) and Venkatesh & Davis (2000), who argued that effort expectancy not only directly influences the intention to use technology but also significantly impacts perceptions of its usefulness. ChatGPT's user-friendly interface, which resembles standard internet searches, requires minimal additional effort for users to learn (Foroughi et al., 2023). This ease of use, particularly evident in ChatGPT's supportive features such as lesson planning, question answering, and content suggestion, significantly influences the intention to adopt the technology in education (Horodyski, 2023). Therefore, our study proposes the following hypothesis:

H2: Effort expectancy positively influences Intention to Use ChatGPT

2.2.3. Social Influence

Social influence refers to the degree to which an individual perceives that important people around them believe they should use a new technological system (Venkatesh et al., 2003). In other words, an individual's acceptance and use of information technology can be driven by social influences (Camilleri, 2024).

Studies examining ChatGPT adoption intentions among various groups, including retired faculty (Zhang et al., 2023), students (Acosta-Enriquez et al., 2024), teachers (Alrishan, 2023), and m-learning users (Alshurideh et al., 2023), consistently suggest that social influence significantly impacts the intention to use AI technologies. Positive social influence can enhance user perceptions of ChatGPT's usefulness and ease of use, thereby reducing barriers to adoption and increasing trust in the technology for improved performance (Menon and Shilpa, 2023). For example, positive social influence can increase ChatGPT acceptance when its benefits and user-friendliness are demonstrated through peer recommendations or observed advantages. When receiving endorsement from colleagues about the benefits and utility of the technology, it becomes more accessible and less intimidating. This contributes to shaping a positive perception of ChatGPT's usability.

Conversely, negative social influence can foster skepticism and concerns about ChatGPT's reliability, accuracy, and ethical implications, thereby hindering user adoption. This challenge is particularly pronounced when faculty members encounter negative opinions regarding the trustworthiness, accuracy, or ethical use of ChatGPT. Such skepticism undermines their confidence in the technology, negatively impacting their intention to use it (Sallam et al., 2024). The spread of misinformation and ethical concerns surrounding ChatGPT can create widespread misunderstandings and anxieties, further exacerbated by sensationalist media coverage and opposition from influential figures (Acosta-Enriquez et al., 2024). Based on these arguments, the study proposes the following hypothesis:

H3: Social influence positively influences Intention to Use ChatGPT

2.2.4. Image

Rogers (1983) identified the desire to enhance social status or personal image in the eyes of others as a key motivator driving individual innovation. Building on this, Moore and Benbasat (1991) defined Image as "the degree to which the use of an innovation is perceived as enhancing the image

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or status of an individual within their social system." The role of Image in the adoption of new technologies has been demonstrated through both direct and indirect effects on the intention to use.

Sang et al. (2009) found that Image is a significant predictor of perceived usefulness, thereby indirectly influencing the intention to use and accept Government Administrative Information Systems (GAIS) in Cambodia. Similarly, Kwee-Meier et al. (2016) confirmed that factors related to Image significantly and positively affect technology acceptance. More recently, Lampo and Silva (2022) explicitly established that Image is a direct predictor of behavioral intention. They demonstrated that individuals who value their image more tend to exhibit a stronger intention to adopt technology.

In this research context, faculty members may perceive using ChatGPT as a way to enhance their image among colleagues and students. This strongly motivates them to adopt ChatGPT in their teaching and research activities. Therefore, we propose the following hypothesis:

H4: Image positively influences Intention to Use ChatGPT

2.2.5. Facilitating Conditions

Facilitating Conditions (FC) refers to "the degree to which an individual believes that the technical infrastructure of an organization exists to support the use of the system" (Venkatesh et al., 2003). These conditions, including resources, technical support, and necessary infrastructure, are essential for fostering user adoption of new technologies (Al-Kfairy, 2024). In an educational context, facilitating conditions (FC) may involve providing detailed guidance, ensuring compatibility between new technology and existing equipment, and offering organizational support (Al-Qudah & Shaalan, 2022). When users perceive these conditions as sufficient and supportive, they are more likely to adopt technology for learning purposes (Canziani & MacSween, 2021).

Empirical studies consistently demonstrate the positive influence of facilitating conditions on users' intention to use technology. For example, Foroughi et al. (2023) emphasized that the availability of adequate infrastructure and support significantly increases the likelihood of technology adoption. Similarly, Kwak et al. (2022) found that factors such as hardware availability, stable internet connectivity, and technical training positively impact users' intention to adopt ChatGPT. However, the impact of facilitating conditions is not uniform and may vary depending on the specific context or user demographics. In the higher education context, facilitating conditions are critical in encouraging faculty members to adopt ChatGPT. Faculty need adequate devices, learning resources, and training. For example, in settings where technical support is lacking, users are less likely to adopt technology, regardless of its perceived usefulness (Al-Kfairy, 2024).

Educators require a supportive environment to seamlessly integrate ChatGPT into their teaching activities. Menon and Shilpa (2023) suggested that resistance to new technology tends to increase when these conditions are not met. Conversely, timely technical support and high compatibility between ChatGPT and existing teaching tools serve as strong motivators for technology adoption. Therefore, we propose the following hypothesis:

H5: Facilitating Conditions positively influence Intention to Use ChatGPT.

2.2.6. Hedonic Motivation

Hedonic Motivation refers to users' enjoyment and satisfaction when using new technology, and it has been proven to be a critical factor in determining technology acceptance and use (Venkatesh et al., 2012). The inclusion of this factor in the analysis is supported by previous studies, which indicate that consumers' technology use is significantly influenced by their perception of the comfort and pleasure that technology provides, such as perceived excitement (Brown & Venkatesh, 2005; van der Heijden, 2004).

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In this study, hedonic motivation is measured by the extent to which university lecturers perceive the use of ChatGPT in their research as enjoyable, engaging, and entertaining. In the academic setting, the positive role of hedonic motivation in the use of ChatGPT has been validated by several prior studies. For instance, Rahim et al. (2022) found that intrinsic factors such as enjoyment and pleasure strongly influence students' intention to use new technology for educational purposes. According to previous research in the context of online learning (e-learning), hedonic motivation drives the acceptance of new technology in education (El-Masri & Tarhini, 2017; Fagan, 2019; Oluwajana et al., 2019; Rahim et al., 2022; Raman & Don, 2013).

Notably, ChatGPT is expected to provide users with a sense of enjoyment even as a digital application due to its human-like communication capabilities and intelligent conversational features (Foroughi et al., 2023). Based on these arguments, the research team proposes that:

H6: Hedonic Motivation positively influences Intention to Use ChatGPT.

2.2.7. Insecurity

Insecurity refers to lecturers' concerns that the use of AI, such as ChatGPT, may lead to academic or ethical issues. This extends beyond the traditional understanding of technology insecurity, which emphasizes distrust in technology's functionality or data security (Parasuraman and Colby, 2015; Suh & Han, 2003). While prior research has often focused on skepticism about a system's ability to work properly or the risks of data breaches (Jahangir & Begum, 2008; Lu et al., 2012), this study shifts attention to the broader implications of AI adoption in academic settings.

The use of ChatGPT raises significant concerns about academic integrity, particularly regarding plagiarism and the erosion of critical thinking, creativity, and problem-solving skills among students (Črček & Patekar, 2023a; Putra et al., 2023). Plagiarism emerges as a major ethical risk, as students can use ChatGPT to generate substantial portions of assignments without proper referencing or original thought (Črček & Patekar, 2023; Putra et al., 2023). These risks align with the ethical dimensions of insecurity explored in educational contexts, where lecturers fear that reliance on AI might undermine the foundational values of higher education.

Additionally, lecturers' insecurity is shaped by apprehensions that AI tools could disrupt the teacher-student dynamic, erode educators' authority, and promote superficial learning. Unlike concerns related to technical malfunctions or data privacy breaches, these insecurities are rooted in the potential for AI to alter pedagogical norms and ethical standards.

This perspective on insecurity contributes to the understanding that psychological barriers to AI adoption are not solely about technical reliability but also about the alignment of technology use with academic and ethical principles. Based on these considerations, this study hypothesizes:

H7: Insecurity negatively influences Intention to Use ChatGPT.

2.2.8. Personal Innovativeness

Personal Innovativeness refers to "the willingness of an individual to try out any new information technology" (Agarwal & Prasad, 1998). Individuals with high personal innovativeness are more likely to explore and learn new technologies, leading to a more significant understanding and utilization compared to others (Barua & Urme, 2023; Oliveira et al., 2016; Agarwal & Prasad, 1998). Moreover, personal innovativeness and a readiness to learn are key factors in an individual's ability to adopt and effectively use new technologies (Kabra et al., 2017). In examining human attitudes toward technology, Park & Woo (2022) analyzed four dimensions: positive emotions, negative emotions, sociality, and functionality. Their research found that personal innovativeness in information technology positively predicts diverse user attitudes when interacting with AI.

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During the Fourth Industrial Revolution (Industry 4.0), AI has emerged as a pivotal factor in global development, with applications spanning agriculture, education, healthcare, finance, entertainment, and numerous other sectors (Rashid & Kausik, 2024). One prominent AI technology, ChatGPT (Generative Pre-trained Transformer), utilizes deep learning techniques to enable human-like conversations, providing users with information and addressing their inquiries (Greitemeyer & Kastenmüller, 2023).

ChatGPT, as one of the most widely used AI systems globally, appeals to individuals through its innovative features and practical utility. Those with high levels of personal innovativeness are more likely to explore and adopt ChatGPT, demonstrating a strong propensity to engage with and embrace new technologies. Based on this reasoning, the following hypothesis is proposed:

H8: Personal Innovativeness positively influences Intention to Use ChatGPT.

2.2.9. Information Accuracy

Information accuracy refers to the extent to which information is consistent, accurate, and error-free (Houhamdi & Athamena, 2019). People are more likely to trust and adopt new technology when they believe the information it provides to be accurate and reliable (Namahoot & Laohavichien, 2015). Learners are more likely to use the new system for academic purposes in the educational setting when information accuracy is high (Aparicio et al., 2017). On the contrary, if users perceive that ChatGPT lacks accuracy and reliability, they are less likely to employ it despite its potential benefits (Panahifar et al., 2018). This is because information accuracy is an essential determinant in determining whether people will trust and use information technologies (Panahifar et al., 2018). Furthermore, if lecturers do not believe ChatGPT is reliable, they may not be influenced by the opinions of others and refrain from insecurity derived from ChatGPT (Foroughi et al., 2023). Lecturers expect to make use of ChatGPT to access reliable and accurate information promptly. Hence, information accuracy is expected to have a moderate influence on the relationship between Intention to Use and other factors. Accordingly, we posit the following hypothesis:

H9: Information Accuracy positively influences Intention to Use ChatGPT and moderates the relationships between Intention to Use ChatGPT and (a) Performance Expectancy, (b) Effort Expectancy, (c) Social Influence, (d) Image, (e) Facilitating Conditions, (f) Hedonic Motivation, (g) Insecurity, (h) Personal Innovativeness.

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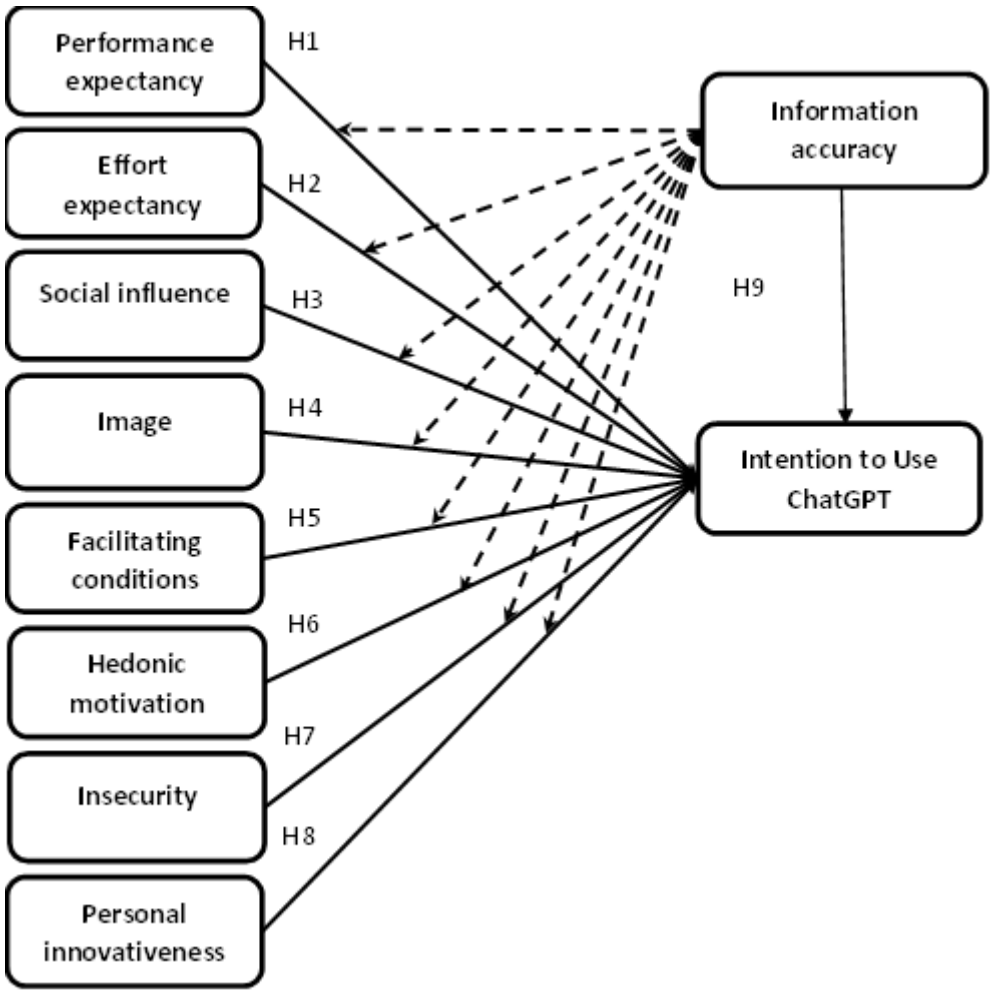

Figure 1. Proposed research model

3. Methodology

3.1. Data collection

The data collection primarily targeted lecturers from major universities in Hanoi, where institutions are considered pioneers in innovation and technology adoption in Vietnam. The research team employed a random sampling method by sending bulk emails to lecturers at these universities. After one month of distributing the survey emails, the team received responses from 460 lecturers across various fields. The survey was conducted in June 2024.

3.2. Measurement Scale Used

The research team used the scales inherited from previous studies that align with the research theme. The research team used a 5-point Likert scale questionnaire to evaluate. Chosen for its ease of use and familiarity, this scale allows respondents to provide accurate answers. The response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

The measurement scales used in this study were adapted and refined from prior research to ensure relevance to the specific research context and conditions. Specifically, the scales for Performance Expectancy, Effort Expectancy and Facilitating Conditions were adapted from Venkatesh et al. (2003, 2012). The scale for Social Influence was modified from Venkatesh & Xu (2012) and Rudhumbu (2022). The scale for Personal Innovativeness was adapted from Agarwal & Prasad (1998) and Nikou & Economides (2017), whereas Image was based on Moore & Benbasat (1991). The measurement scales for Hedonic Motivation were adapted from Venkatesh & Xu (2012) and

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Nikolopoulou et al. (2021), while those for Information Accuracy were drawn from Filieri & McLeay (2014). Both Hedonic Motivation and Information Accuracy were further refined and modified to align with the specific context of the survey. For Insecurity, the research team developed a new measurement scale to ensure alignment with the study's objectives. The scale for the dependent variable, Intention to Use, was adapted from Venkatesh & Xu (2012), Barua and Urme (2023).

To ensure face validity, a back-translation method was employed. First, a translator translated all original items into Vietnamese. Then, a second independent translator translated the Vietnamese version back into English. The two English versions (original and back-translated) were compared, and any discrepancies were resolved to ensure accuracy and consistency.

3.3. The sample

The sample consisted of 460 participants, of which 58.3% were female and 41.7% were male. The majority were aged between 35 and 44 years (42%), with teaching experience predominantly ranging from 10 to 20 years (38%). The primary teaching fields were Commerce, Services, Economics, and Business (48%). Regarding the use of ChatGPT, 50% were current users, 35.7% had never used it, and 14.3% had discontinued using it.

3.4. Measure reliability and validity

To assess the reliability and validity of the scales, the research team conducted Cronbach's Alpha analysis and Exploratory Factor Analysis (EFA)

The test results show that all 10 factors have Cronbach's alpha coefficients greater than 0.6, and the total variable correlation coefficients of the 40 observed variables are all greater than 0.3. This indicates that the scales meet the reliability requirements, and all 40 observed variables are retained for the next analysis step.

Table 1. Results of Cronbach's alpha

	Constructs	Cronbach's alpha
PE	Performance expectancy	0.889
EE	Effort Expectancy	0.883
FC	Facilitating conditions	0.632
SoI	Social influence	0.898
IM	Image	0.780
HM	Hedonic motivation	0.858
IS	Insecurity	0.885
IA	Information Accuracy	0.875
PIA	Personal innovativeness	0.922
IU	Intention to use	0.941

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For the EFA, the variables Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, Image, and Personal Innovativeness were analyzed using the principal component analysis (PCA) method with Varimax rotation. It was conducted to identify the underlying factor structure of the observed variables. Varimax rotation facilitated the simplification of the factor structure, enhancing interpretability. The process was based on the principle of removing variables that showed poor correlation between the observed variables and the factors, as well as eliminating poorly performing observed variables with a factor loading coefficient less than the standard factor loading of 0.5. The results show that the factors are retained for the subsequent analysis. The total variance explained is 76.533% (>50%), indicating that these factors account for 76.533% of the variance in the observed variables, which is considered acceptable.

3.5. Data analyst

The regression method used to examine the relationships between the variables in this study includes analyzing the moderating effects of the moderator variables on the relationship between the independent and dependent variables. Multiplication variables were created by multiplying the moderator and the independent variables to test for moderation effects. However, to remove the nonessential correlations between the multiplication variables and the independent variables that create them, we mean-centered the independent variable and the moderator variables before taking the multiplication (Cohen et al., 2003; Nguyen et al., 2018). The ordinary least squares (OLS) regression method was used to examine the relationships between the variables. According to Nguyen et al. (2018), three regression models were analyzed:

- M1: the dependent variable (IU) and 8 independent variables (PE, EE, FC, SoI, IM, HM, IS, PIA). This base model was constructed to examine the direct relationships between independent variables and the Intention to use ChatGPT, establishing the fundamental relationships in our theoretical framework.

- M2: the dependent variable (IU), 8 independent variables (PE, EE, FC, SoI, IM, HM, IS, PIA) and the moderating variable treated as an independent variable (IA). It was developed to test the additive effects by treating the moderating variable as an independent variable. This step was necessary to establish whether Information Accuracy had any direct effects before testing its moderating effects.

- M3: the dependent variable (IU) and 8 independent variables (PE, EE, FC, SoI, IM, HM, IS, PIA) and the moderating variable (IA). The complete model incorporated the moderating effects through interaction terms, allowing us to test our moderation hypotheses. This final model provides a comprehensive test of our theoretical framework.

4. Results

The relationships are considered statistically significant when the p-value < 0.1.

From the regression test results, the Model Summary R-squared of the entire model M3 is 63.3%, which is higher compared to M1 (59.5%) and M2 (61.7%). The significance value of the F-test of three models is 0.000, indicating that all three models are good fit and that the moderating variable impacts the relationship between the independent variables and the dependent variable. Additionally, the Durbin-Watson value of M3 is 2.049, which falls within the acceptable range of 1 to 3, indicating that there is no autocorrelation in the model.

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Table 2. Regression coefficients results

	M1		M2		M3	
	Standardized Coefficients (β)	Sig. (p-value)	Standardized Coefficients (β)	Sig. (p-value)	Standardized Coefficients (β)	Sig. (p-value)
Constant		0.798	0.406	0.000		0.666
PE	0.431	0.000	0.156	0.000	0.404	0.000
EE	0.151	0.000	-0.128	0.000	0.123	0.005
FC	-0.119	0.001	0.128	0.000	-0.103	0.004
SoI	0.157	0.000	0.111	0.001	0.120	0.001
IM	0.147	0.000	-0.056	0.091	0.096	0.006
HM	-0.038	0.263	-0.064	0.042	-0.022	0.530
IS	-0.058	0.075	0.201	0.000	-0.075	0.031
PIA	0.240	0.000	0.184	0.000	0.227	0.000
IA			0.406	0.000	0.169	0.000
IAxPE					-0.016	0.744
IAxEE					-0.098	0.020
IAxFC					0.002	0.949
IAxSoI					0.016	0.660
IAxIM					0.077	0.066
IAxHM					0.103	0.008
IAxIS					0.093	0.022
IAxPIA					-0.158	0.003
R-Square	0.602		0.625		0.646	
Adjusted R-Square	0.595		0.617		0.633	

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In the base model M1, key significant determinants of Intention to use ChatGPT include Performance Expectancy (β = 0.431, p-value = 0.000), Effort Expectancy (β = 0.151, p-value = 0.000), Facilitating Conditions (β = -0.119, p-value = 0.001), Social Influence (β = 0.157, p-value = 0.000), Image (β = 0.147, p-value = 0.000), Insecurity (β = -0.058, p-value = 0.075), and Personal Innovativeness (β = 0.240, p-value = 0.000). Notably, the effect of Hedonic Motivation (p-value = 0.263) and constant variable (p-value = 0.798) are not statistically significant, meaning they do not provide a meaningful contribution to Intention to use ChatGPT in the model.

In M2, Information Accuracy (β = 0.406, p-value = 0.000) is introduced and shows a significant impact on Intention to use ChatGPT, along with Performance Expectancy (β = 0.156, p-value = 0.000), Effort Expectancy (β = -0.128, p-value = 0.000), Facilitating Conditions (β = 0.128, p-value = 0.000), Social Influence (β = 0.111, p-value = 0.001), Insecurity (β = 0.201, p-value = 0.000), and Personal Innovativeness (β = 0.184, p-value = 0.000). In contrast with the base model, Image (β = -0.056, p-value = 0.091) becomes marginally insignificant, and Hedonic Motivation (β = -0.064, p-value = 0.042) shows statistically significant impact at the 5% level. Although the constant variable is statistically significant (p-value = 0.000), this may be due to the way variables are structured or randomness rather than an actual effect on the dependent variable.

The complete model M3 indicate that factors such as Performance Expectancy (β = 0.404, p-value = 0.000), Effort Expectancy (β = 0.123, p-value = 0.005), Social Influence (β = 0.12, p-value = 0.001), Image (β = 0.096, p-value = 0.006), Personal Innovativeness (β = 0.227, p-value = 0.000), and Information Accuracy (β = 0.169, p-value = 0.000) significantly influence Intention to Use, aligning with the initial hypothesis. Additionally, the results demonstrate that Insecurity (β = -0.075, p-value = 0.031) and Facilitating Conditions (β = -0.103, p-value = 0.004) negatively impacts Intention to Use. In contrast, similar to the base model, the effect of Hedonic Motivation (p-value = 0.530) and the constant variable (p-value = 0.666) are not statistically significant.

Regarding the moderating role of Information Accuracy, the findings reveal that it negatively moderates the effects of Image and Insecurity. Conversely, Information Accuracy also negatively moderates the effects of Personal Innovativeness and Effort Expectancy. However, there is no evidence to support its moderating role in the relationships between Performance Expectancy, Facilitating Conditions, and Social Influence (Table 2).

5. Discussion

This study aims to understand the current usage of ChatGPT in university lecturers' work and identify the main factors influencing lecturers' intention to use it. The results of the hypothesis are listed below.

Table 3. Results of Testing Hypotheses

	Hypotheses	Results
H1	Performance Expectancy positively affects Intention to Use ChatGPT	Supported
H2	Effort Expectancy positively influences Intention to Use ChatGPT	Supported
H3	Social Influence positively influences Intention to Use ChatGPT	Supported
H4	Image positively influences Intention to Use ChatGPT	Supported
H5	Facilitating Conditions positively influence Intention to Use ChatGPT	Supported
H6	Hedonic Motivation positively influences Intention to Use ChatGPT	Not supported
H7	Insecurity negatively influences Intention to Use ChatGPT	Supported
H8	Personal Innovativeness positively influences Intention to Use ChatGPT	Supported
H9	Information Accuracy positively influences Intention to Use ChatGPT	Supported

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H9a	Information Accuracy moderates the relationships between Intention to Use ChatGPT and Performance Expectancy	Not supported
H9b	Information Accuracy moderates the relationships between Intention to Use ChatGPT and Effort Expectancy	Supported
H9c	Information Accuracy moderates the relationships between Intention to Use ChatGPT and Social Influence	Not supported
H9d	Information Accuracy moderates the relationships between Intention to Use ChatGPT and Image	Supported
H9e	Information Accuracy moderates the relationships between Intention to Use ChatGPT and Facilitating Conditions	Not supported
H9f	Information Accuracy moderates the relationships between Intention to Use ChatGPT and Hedonic Motivation	Not supported
H9g	Information Accuracy moderates the relationships between Intention to Use ChatGPT and Insecurity	Supported
H9h	Information Accuracy moderates the relationships between Intention to Use ChatGPT and Personal Innovativeness	Supported

Empirical findings demonstrate that Performance Expectancy has a positive influence on Intention to Use, highlighting a robust correlation between perceived system utility and the intent to use the system. When lecturers perceive the significant performance benefits of ChatGPT, their intention to use it increases substantially. This finding aligns with previous research, such as the studies by Rahim et al. (2022), Al-Emran et al. (2023), and Foroughi et al. (2023). This phenomenon can be primarily attributed to ChatGPT's ability to provide personalized assistance through advanced natural language processing algorithms, enabling customized responses that cater to individual academic preferences and specific requirements (Foroughi et al., 2023).

The findings further demonstrate that Effort Expectancy positively influences lecturers' Intention to Use ChatGPT, highlighting the role of this construct in technology adoption decisions. When lecturers perceive ChatGPT as easy to use – requiring minimal effort – their intention to adopt the technology increases. This finding is consistent with the works of Alyoussef (2022), Menon and Shilpa (2023), and Camilleri (2024), all of which underscore the importance of Effort Expectancy in facilitating the acceptance of emergent technologies such as ChatGPT. This correlation can be attributed to the distinctive characteristics of lecturers, who prefer pedagogical tools that offer ease of use (Zhao et al., 2021). The evidence suggests that lecturers prioritize user-friendly technologies over complex systems that require considerable time and effort to learn (Foroughi et al., 2023).

The findings also show that Social Influence exhibits a positive effect on Intention to Use, which is evidenced in the works of Zhang et al. (2023), Alrishan (2023), Alshurideh et al. (2023), and Acosta-Enriquez et al. (2024). These studies uniformly emphasize the crucial role of Social Influences in shaping lecturers' propensity to integrate artificial intelligence technologies within educational contexts. The data suggests that when individuals experience social encouragement or perceived pressure from their professional network, their inclination towards technological adoption increases substantially. Specifically, within the academic context, it increases intellectual curiosity and enhances awareness regarding ChatGPT's potential applications, thereby fostering increased exploration and utilization of the technology amongst lecturers.

Contrary to the hypothesis, the relationship between Facilitating Conditions and Intention to Use exhibited a negative impact. This finding diverges from prior studies, such as Al-Qudah & Shaalan (2022), and Foroughi et al. (2023), which suggested that facilitating conditions play a crucial role in fostering the adoption of educational technology. This result may stem from insufficient university institutional support to encourage ChatGPT adoption among lecturers. Since most lecturers use

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ChatGPT independently, they may perceive external support as unnecessary, and excessive support could even undermine their motivation or autonomy. This finding is consistent with Hsu & Lin (2016), who reported that over-support can reduce intrinsic motivation in educational contexts.

The influence of Personal Innovativeness on Intention to Use is also supported. This suggests that individuals who are more innovative or willing to experiment with new technologies are more likely to adopt ChatGPT. This finding is consistent with the studies in technology acceptance literature, including those by Agarwal and Prasad (1998), Oliveira et al. (2016), Barua and Urme (2023). These studies uniformly emphasize the crucial role of Personal Innovativeness – curiosity and interest in new technologies - in facilitating technological acceptance. ChatGPT's novel and pragmatic features resonate with this innovative disposition, thereby increasing its adoption and integration within academic practice.

The regression results indicate that Hedonic Motivation does not significantly impact lecturers' Intention to Use ChatGPT for academic purposes. This finding contrasts with previous studies, such as Rahim et al. (2022) and Oluwajana et al. (2019), which highlighted the importance of enjoyment in technology adoption. This suggests that the hedonic value of ChatGPT is not a primary driver for lecturers to use it. To stimulate adoption, it is essential to focus on academic benefits, such as research and teaching support or administrative assistance.

Image is another factor positively influencing Intention to Use. When lecturers perceive that ChatGPT enhances or aligns with their image, their intention to adopt it increases moderately. This research emphasizes the significant role of Image as a key predictor of behavioral intention, especially in situations where social judgment influences user decisions. This finding indicates the importance of Image as a crucial factor in determining behavioral intention, particularly within professional settings where technological adoption decisions are subject to peer review and institutional oversight. The integration of ChatGPT in the work of lecturers serves as a visible indicator of technological proficiency and innovative teaching practices, potentially enhancing a lecturer's professional standing among colleagues, students, and other institutional stakeholders. This finding aligns with the research of Kwee-Meier (2016) and Lampo and Silva (2022), who similarly highlight the importance of enhancing professional image as a key driver for technology adoption in educational settings.

The research reveals significant Insecurity among lecturers regarding the ethical and pedagogical implications of incorporating ChatGPT into teaching practices. These findings align closely with contemporary scholarly discourse, particularly concerning ethical research concerns (Črček & Patekar, 2023) and pedagogical implications. Notably, lecturers express substantial apprehension regarding potential student over-reliance on ChatGPT, which could diminish engagement with course materials and hinder the development of higher-order cognitive skills, such as critical thinking and creativity (Putra et al., 2023). Furthermore, concerns regarding data privacy and personal security emerge as significant factors (Jahangir & Begum, 2008; Suh & Han, 2003), reflecting broader discussions within the educational technology adoption literature. The evidence suggests that these multifaceted concerns exert a demonstrable negative influence on lecturers' intention to adopt ChatGPT within educational contexts. This hesitancy underscores the complex interplay between technological innovation and pedagogical practice, emphasizing the need for careful consideration of ethical implications, student learning outcomes, and data security protocols in the successful integration of educational technology.

The positive influence of Information Accuracy on Intention to Use aligns with Aparicio et al.'s (2017) study, which emphasizes the critical role of information precision in educational technology adoption. This correlation reflects a fundamental reality within academic contexts: information accuracy transcends basic requirements, emerging as a crucial factor in building trust and facilitating

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technological integration. Lecturers expect ChatGPT to not only be functionally useful but also to adhere to rigorous accuracy standards to support both teaching and research activities effectively. This emphasis on accuracy highlights the unique nature of academic technology adoption, where the integrity and reliability of information are essential for professional acceptance and implementation.

Beyond direct effects, the moderating role of Information Accuracy was extensively examined. The empirical findings reveal that Information Accuracy does not moderate the relationships between Performance Expectancy, Social Influence, and Facilitating Conditions on Intention to Use, which is consistent with earlier studies by Foroughi et al. (2023) and Bahadur et al. (2024) regarding students' ChatGPT adoption intentions. This parallel between lecturers' and students' perspectives in approaching ChatGPT adoption merits careful consideration. Several theoretical and practical implications emerge from this finding. Notably, ChatGPT's capacity for rapid content generation appears to supersede considerations of complete accuracy in specific contexts. Lecturers may prioritize efficiency over absolute precision, particularly for preliminary tasks such as instructional planning and framework development (Bahadur et al., 2024). Furthermore, the influence of credible endorsements, prevailing usage trends, and facilitating conditions appear to create sufficient momentum for experimental adoption, potentially diminishing the relative significance of information accuracy as a moderating factor.

In contrast to the findings of Foroughi et al. (2023) and Bahadur et al. (2024) regarding student adoption patterns, our analysis reveals significant moderating effects of Information Accuracy on the relationships between Effort Expectancy, Image, Insecurity, and Personal Innovativeness. Specifically, Information Accuracy demonstrates positive moderating effects on the relationships between Image and Insecurity with adoption intentions. This divergence from student-focused research merits careful consideration. Lecturers often perceive the integration of technological tools like ChatGPT as a demonstration of their innovative capacity and technological adaptability, thus enhancing their professional standing. This perception strengthens considerably when ChatGPT exhibits high accuracy levels, as lecturers associate the use of precise AI tools with maintaining academic credibility and professional standing within scholarly communities. Moreover, concerns regarding academic integrity tend to diminish when ChatGPT's information sources are verifiable, while apprehension regarding student engagement decreases when instructors can verify the reliability of accessed information. Conversely, Information Accuracy demonstrates negative moderating effects on the relationships between Personal Innovativeness and Effort Expectancy and adoption intentions. This finding suggests that emphasizing information accuracy may potentially dampen system enthusiasm among highly innovative individuals. This complex interplay between creativity and information accuracy within educational environments, particularly concerning AI-driven content generation and assessment tools, warrants further exploration. Furthermore, while ChatGPT use may initially be perceived as effort-efficient, the perceived value of this efficiency diminishes when information accuracy falls below expected thresholds, subsequently weakening adoption intentions. This finding reflects lecturers' prioritization of information quality over mere convenience.

6. Conclusion

The emergence of generative artificial intelligence (AI) technologies, particularly ChatGPT, represents a remarkable shift in educational and academic methods. This technological evolution has marked fundamental changes in teaching-learning dynamics, prompting extensive studies into the determinants of lecturers' intention to use new technology. By employing the UTAUT2 framework, this paper offers significant insights into the determinants of intention to use ChatGPT among university lecturers, contributing to both theoretical understanding and practical implementation of AI technologies in higher education. The results confirm the positive influence of Performance Expectancy, Effort Expectancy, Social Influence, Image, Personal Innovativeness, and Information Accuracy on Intention to Use ChatGPT. On the other hand, Insecurity and Facilitating Conditions

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negatively impact Intention to Use ChatGPT while Hedonic Motivation shows no significant influence. Furthermore, Information Accuracy is proven to have moderating effect on the relationship between some constructs of the extended UTAUT2 model and the Intention to Use ChatGPT.

The study's theoretical contribution lies in its extension of the UTAUT2 model through the integration of novel constructs (Image, Personal Innovativeness, and Insecurity). This finding underscores the importance of personal factors in technology adoption decisions. The identification of Information Accuracy as both a direct determinant and a moderating variable highlights the critical importance of content reliability and complex dynamics of AI technology integration in education, especially within academic contexts where information integrity is critical. The findings also challenge conventional assumptions about Facilitating Conditions in academic contexts, revealing an unexpected negative relationship that suggests the need for reconceptualizing institutional support mechanisms in professional academic settings. Overall, this paper contributes to the growing body of knowledge on AI integration in higher education, providing empirically-grounded insights for optimizing technology adoption while maintaining academic standards.

7. Suggestion

7.1. Theoretical Implications

This paper makes several significant theoretical contributions to the understanding of technology adoption in higher education contexts. The study extends the UTAUT2 framework by incorporating novel constructs relevant to AI adoption in educational settings. Firstly, Performance Expectancy, Effort Expectancy, and Social Influence continue to demonstrate their importance in the model as key factors that influence the intention to use ChatGPT. In addition, Personal Innovativeness and Image highlight the importance of personal identity as a key consideration in academic settings, especially when adopting new technologies such as ChatGPT. On the other hand, lecturers expressed significant concerns about Insecurity, particularly regarding academic integrity and how students use it[PV1]. Furthermore, the observed negative relationship between Facilitating Conditions and Intention to Use significantly deviates from established UTAUT2 propositions. This finding necessitates a critical re-examination of theoretical frameworks governing the influence of institutional support within highly autonomous professional environments, such as academia, where individual expertise and academic freedom are paramount. In addition, this study emphasizes the theoretical importance of information accuracy in AI technology adoption. It demonstrates that accurate information acts as both a direct driver and a moderator of AI adoption, and that the quality of information can significantly alter the established relationships between adoption factors.

7.2. Practical Implications

This paper provides practical insights for both higher education institutions and policymakers. Policymakers should prioritize the development of standards and regulatory frameworks for AI in education, ensuring a balance between innovation and academic quality. Higher education institutions must establish clear guidelines and policies for ChatGPT usage, addressing faculty concerns about information accuracy and academic integrity. Furthermore, robust faculty training programs and university support systems are crucial for effective AI integration in teaching and the evaluation of AI-generated content. Furthermore, peer learning and experience sharing among faculty members cultivate a supportive institutional culture that encourages the responsible adoption of AI while upholding academic integrity. These insights help stakeholders refine their approach to effectively integrating ChatGPT and similar AI tools into higher education, addressing challenges and capitalizing on opportunities to enhance the teaching and learning experience.

7.3. Limitations and Future Research Suggestions

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The study has achieved many positive results, but there are still limitations that need to be addressed in future research:

Firstly, ChatGPT has only been around briefly, and the number of users is still limited. Therefore, it is difficult to expand the sample size and collect data. The sample of this study only consists of 460 lecturers working in universities around Hanoi, Vietnam. The generalization of the research results to the population of lecturers should be done with caution. Although the study provides meaningful outcomes, more studies are needed to explore lecturers' intentions from other backgrounds and regions.

Secondly, the study uses cross-sectional data and is limited to a specific period. Therefore, it is not enough to test causality and may not reflect changes in the intention to use ChatGPT as the technology evolves or as lecturers' perceptions change over time. Future studies can be done to further explore these changes and provide meaningful comparisons.

Thirdly, some hypotheses of the study were rejected, and some hypotheses got contradictory outcomes. These may be due to the limited data, the new and rapidly changing context, or other reasons. Further studies should be done to confirm these results.

Declarations

Author Contributions. All authors have read and approved the published on the final version of the article.
Conflicts of Interest. The authors declare no conflict of interest.
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Ethical Approval. This research complies with the ethical guidelines and standards set forth by National Economics University's Committee of Science and Training, Vietnam. The methodology and ethical considerations have been reviewed and approved to ensure the protection of participants' rights and well-being. By adhering to these principles, we affirm that the primary data used in this submitted research is free from collecting any personal information and poses no harm to the respondents. Respondents were given a clear explanation of the purpose of the survey and were asked to confirm their voluntary participation
Data Availability Statement. All data generated or analysed during this study are included in this published article
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During the preparation of this work the authors used ChatGPT in order to translate the article and related documents between English and Vietnamese. The authors declare that they reviewed and edited the final output as needed and take full responsibility for the content of the published article.

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