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CHATGPT ACCEPTANCE AMONG STUDENTS: AN INFORMATION SYSTEMS PERSPECTIVE IN THE ERA OF GENERATIVE AI

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Abstract

This study investigates the factors influencing university students' acceptance and use of ChatGPT from an information systems perspective in the context of generative artificial intelligence (GenAI). As AI technologies become more common in society, their adoption within higher education has been rapidly increasing. Students are utilizing tools such as ChatGPT for a variety of purposes, including information retrieval, writing support, and comprehension of complex academic topics. Despite their educational potential, concerns about academic integrity, accuracy, and their effect on students' critical thinking have been raised. This study adopts a quantitative approach using a survey method to collect data from 650 undergraduate students of the Faculty of Management Studies and Commerce at the University of Jaffna (UOJ), Sri Lanka. This study is based on information systems success theory and technology acceptance model. This model depicts the impact of information quality, system quality, service quality, trust in service and self-confidence on system use, user satisfaction, and student achievability, as well as the effect of on student perceived benefits. In order to test the relationships above, the data was analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach via the SmartPLS software. Furthermore, system quality, service quality, trust, and self-confidence significantly influence user satisfaction and system use. Student achievability and user satisfaction were found to have a strong positive impact on perceived student benefits. However, information quality did not significantly influence system use, satisfaction, or achievability. Overall, the findings underscore the importance of both technological and psychological factors in shaping students' experiences and attitudes towards generative AI tools, providing valuable insights for educators and institutions interested in utilizing these technologies responsibly and effectively in higher education contexts.

Keywords: ChatGpt Adoption, Generative Artificial Intelligence (GenAI), Technology Acceptance, Information System Quality, Student Perceived Benefits.

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1. Introduction

Digital technologies are having a transformational impact on higher education. Over the last decade, there has been an increase in the adoption of AI, machine learning, and natural language processing in higher education. AI technologies are aligned with the support of teaching and learning as well as scholarly research processes. AI technologies have resulted in the development of intelligent systems, computer programs that use artificial intelligence to emulate human abilities such as reasoning, learning, and problem-solving. These intelligent systems have the potential to improve the efficiency and accessibility of education through providing students with information, generating ideas, and offering personalized assistance (Baidoo-Anu & Owusu Ansah, 2023; Berényi et al., 2025; Ray, 2023).

One of the technologies that has received a lot of attention in the last few years is generative artificial intelligence (GenAI), which generates human-like text, images, and other digital media through the use of advanced deep-learning models. Perhaps one of the most well-known examples of generative AI is a conversational generative AI chatbot called ChatGPT. ChatGPT is built on large language models that have been pretrained using large amounts of data from human language use. Its capability to generate contextually coherent sentences, answer questions, explain topics, and write articles, along with its ability to take a prompt and generate a response based on that prompt. It has made ChatGPT one of the most used AI generation tool by students and academics internationally. Research suggests that the use of generative artificial intelligence tools has rapidly accelerated since the release of ChatGPT to the public in late 2022, and these tools have good potential to assist learning and productivity (Rospigliosi, 2023; Farrokhnia et al., 2023).

There are both supporters and critics to the use of ChatGPT in postsecondary education. Supporters of using artificial intelligence tools such as ChatGPT in higher education argue that they may assist students in their learning by allowing them to more easily find information, receive responses to their work, and understand complex academic topics. These capabilities can support learners and students in their self-directed learning endeavors, for example, when problem-solving, acquiring knowledge, or improving writing skills (Cotton et al., 2023; Rudolph et al., 2023). Furthermore, generative AI tools can assist learners and students when working on learning content and acquiring knowledge and competencies, such as writing or understanding difficult concepts.

Generative AI's use in education has attracted criticism for potential threats to academic integrity, ethical issues, and detrimental effects on students' critical thinking and problem-solving abilities. Researchers have expressed concerns that excessive reliance on AI tools may affect students' originality in academic work and may challenge traditional assessment methods in higher education (Perkins, 2023; Susnjak, 2022). Similarly, scholars have emphasized the need to carefully evaluate the benefits and risks associated with generative AI technologies to ensure their responsible integration into educational practices (Crawford et al., 2023; Sullivan et al., 2023).

Despite these concerns, generative AI tools like ChatGPT, have been widely adopted among students for studying purposes. They use them to summarize study materials, generate ideas for assessments, translate texts and get explanations on potentially difficult concepts. Such benefits play an important role in improving students' learning efficiency and productivity while reducing the time they spend on customary information sources (Cooper, 2023; Kohnke et al., 2023). Accordingly, the factors that influence the acceptance and adoption of ChatGPT by students have become an important issue for researchers in the field of education.

Several models have been developed to describe the adoption of new technologies in education. The Technology Acceptance Model (TAM), along with the Unified Theory of Acceptance and Use of Technology (UTAUT), are two of the most popular models for assessing how users feel and behave towards new technology (Davis, 1989; Venkatesh et al., 2003; Venkatesh et al., 2012). These models stress perceived usefulness, perceived ease of use, social influence, and easing conditions as key factors in explaining end-users' acceptance of technology systems. Previous research has used these models to study the adoption of technology systems such as AI-based educational technology, including ChatGPT.

In a study among students to test their acceptance of ChatGPT, performance expectancy, effort expectancy, habit, and hedonic motivation were found to be key determinants of students' intention to embrace AI tools for educational purposes. Among other studies about undergraduate students in Sri Lanka employed the UTAUT2 model to examine the factors driving ChatGPT usage in higher education (Sabraz Nawaz et al., 2024). The results have shown that habit and performance expectancy were the most significant predictors of students' intention to use ChatGPT, followed by hedonic motivation and perceived ease of use. Furthermore, the analysis also indicated that behavioral intention and personal innovativeness strongly influenced pupils' actual use of ChatGPT, thereby stressing the importance of individual factors in technology adoption in education.

The growing body of literature on AI adoption in education highlights the importance of understanding both technological and behavioural factors that influence students' use of AI tools. In many developing countries, including Sri Lanka, digital technologies are increasingly integrated into higher education institutions to enhance teaching and learning practices. Studies conducted in the Sri Lankan educational context have demonstrated that students' adoption of digital learning technologies is influenced by factors such as technological infrastructure, user perceptions, and institutional support (Samsudeen & Mohamed, 2019; Shameem & Sanjeetha, 2021). Furthermore, there is an emerging body of research evidence that Sri Lankan students have started to integrate AI writing tools (such as ChatGPT) as an integral part of language learning or as a tool for academic writing (Fairooz et al., 2023; Samarasinghe & Prasangani, 2023).

Despite growing interest in generative AI technologies, few studies have empirically examined ChatGPT from an information systems perspective. Previous research on ChatGPT has largely focused on topics such as behavioral intention and technology adoption, while investigations into how system-related components impact students' perceptions and experiences of AI-based

technologies have been limited. Especially the factors of information quality, system quality, service quality, trust and self confident perceptions seem to be relevant in determining whether generative AI systems will be used by students to promote meaningful learning processes.

Information quality is an important issue in generative AI systems. Generative AI systems provide answers based on collective probabilistic predictions matching the input text, not retrieving it from a database. Information quality directly affects the trust and satisfaction associated with using generative AI systems. System quality, here referred to as the usability, accessibility, and reliability of the system to deliver content, as well as service quality and trust, may also be important factors that can influence students' acceptance of AI applications for academic purposes. This background is important as it sets out the foundation for the factors that drive efficacy for ChatGPT within the university context. One such factor is students' perceptions of generative AI systems as credible, trustworthy, and easy to use. This may have a positive effect on educational attainment, learning outcomes, and educational benefit.

Therefore, the objective of this research is to investigate the factors influencing the acceptance and success of ChatGPT in university students from the information systems perspective. This study focuses on the influence of information quality, system quality, service quality, trust and worthy, and self confident on system use, user satisfaction, and academic achievability. Additionally, this study examines the relationship between the factors influencing the adoption of ChatGPT in higher education and its perceived benefits (students' benefits). This contributes to the literature on the use of artificial intelligence in education and provides insights for educators, researchers, and stakeholders seeking to effectively utilize AI tools in higher education.

2. Literature Review

2.1 Artificial Intelligence and ChatGPT in Higher Education

Artificial intelligence (AI) is an emergent and important technology that is now shaping education globally. AI is defined as computer systems that can learn, reason and make decisions in ways similar to humans (Axcell & Ellis, 2023). Artificial intelligence systems based on machine learning and natural language processing are used to ease teaching and learning, increasing the availability of information and supporting tasks related to education (Onyema et al., 2022).

Generative artificial intelligence (generative AI) is a type of AI that generates human-like text and converses with users on a conversational interface. ChatGPT is one of the most popular generative AI and, in educational learning environments, is used for generating explanations, writing assignments, and other academic activities like essay-writing (Rospigliosi, 2023; Ray, 2023). ChatGPT was shown to give rapid feedback, increase students' completion of assignments, assist in understanding academic topics, and improve productivity and educational performance (Cotton et al., 2023; Rudolph et al., 2023). AI learning tools provide timely information to students, allow self-study to be undertaken independently, and ease self-regulation and management (Baidoo-Anu & Owusu Ansah, 2023).

Other problems have also been raised about the use of ChatGPT in education, such as academic integrity, the trustworthiness of ChatGPT, and the impact on learners' critical thinking skills (Perkins, 2023; Susnjak, 2022). Despite these potential issues, ChatGPT has become increasingly more popular among learners and students for the purpose of learning and academics. The finding suggests that we should understand the factors that affect students' acceptance and use of this technology in higher education.

2.2 Technology Acceptance of AI Tools

The adoption of emerging technologies is commonly explained using frameworks such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). TAM proposes that perceived usefulness and perceived ease of use influence users' acceptance of technology (Davis, 1989), while UTAUT highlights factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions as key determinants of technology adoption (Venkatesh et al., 2003; Venkatesh et al., 2012).

These models have commonly been used in research on students' acceptance of e-learning systems and artificial intelligence-based systems. Prior research has shown that perceived usefulness, ease of use, and trust in ChatGPT significantly predict students' intention to utilize artificial intelligence tools for academic assistance and purposes (Foroughi et al., 2023; Strzelecki, 2023). In the context of Sri Lanka, habit, performance expectancy, hedonic motivation, and perceived ease of use are important determinants of undergraduate students' behavioral intention to use ChatGPT (Sabraz Nawaz et al., 2024;Lim et al., 2023).

In developing countries, technological infrastructure, institutional support, and the perceived usefulness of technology by students have been identified as influencing the adoption of digital learning technologies (Samsudeen & Mohamed, 2019; Shameem & Sanjeetha, 2021). These findings highlight that technological and behavioral factors can influence the adoption of AI technologies in higher education in various contexts.

2.3 Information System Quality and User Experience

Although user behavior factors have dominated the discussion on technology adoption, technological features related to user experience have also been found to play a role. Information systems research identifies information quality, system quality, and service quality as key factors shaping technological platform performance. Information quality is the accuracy, relevance, and usefulness of information provided by a system. In generative AI systems such as ChatGPT, the information quality perceived by students is very important for student satisfaction and reuse of this information. System quality is the technical performance of the system. It includes usability, reliability, and responsiveness of the system. Usability refers to how easy to navigate and use the tool. Reliability refers to having the system available at all times. Responsiveness refers to the speed of the system to react to user commands.

Furthermore, the belief that AI-generated information is credible and trustworthy is considered another important factor for acceptance. For example, students are more likely to use tools such as ChatGPT to assist their academic tasks if they trust the AI tool. In a similar way, self-

confident is another important factor influencing the digital adoption among students, as users' self-confident of using AI systems significantly affects their intention of using these systems in their study.

2.4 ChatGPT Use, Satisfaction, and Student Benefits

Another measure of AI effectiveness in education is the correlation with learning outcomes or academic performance (Baidoo-Anu & Owusu Ansah, 2023; Almogren et al., 2024). System use might be operationalized in terms of the frequency with which students use AI tools such as ChatGPT for certain types of learning-related tasks. In addition, usability may also be evaluated with task completion speed and academic performance, where improvements in efficiency and effectiveness may improve students' learning and academic achievement. User satisfaction with AI tools may also be assessed. At large, ChatGPT use may benefit students by improving their understanding of course material as well as their efficiency in the learning process. More research is needed to understand how system-related constructs may impact students' experiences with generative AI educational technologies. This study investigates the associations of information quality, system quality, service quality, trust, self-confidence and other factors with system use, user satisfaction, student achievability and perceived student benefits in generative AI technologies.

3. Methodology

3.1 Research Design

A quantitative research design was used in this study to analyze the factors affecting university students' acceptance and adoption of the ChatGPT tool. Quantitative research is widely used in technology acceptance and information systems research because it allows researchers to examine the relationships between variables and test theoretical models using statistical techniques (Sekaran & Bougie, 2016). This research seeks to investigate the effects of information quality, system quality, service quality, trust, and self-confidence on system use, user satisfaction, and student achievability and how they affect perceived student benefits in the context of ChatGPT use.

The method for collecting primary data was a survey. The participants in the survey were undergraduate students from faculty of Management studies and commerce, who used ChatGPT for academic purposes. Survey research is a common approach to studying information systems and technology adoption because it allows researchers to gather large amounts of data and test complex relationships between multiple constructs (Hair et al., 2012).

3.2 Measurement Instruments

For data collection, a questionnaire was constructed using measurement scales commonly used in IS/IT adoption research. The final questionnaire consisted of two parts. The first part of the questionnaire collected demographic information, including gender, academic year, province of residence, students' mother tongue, and the language they use when interacting with ChatGPT. The second of the questionnaire measured the constructs: information quality (INQ), system quality (SYQ), service quality (SEQ), trust and worthy (TRU), self-confident (SEC),

system use (USE), user satisfaction (SAT), achievability (ACH) and student benefits (STB). All the constructs were measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) (Hair et al., 2012).

3.3 Sampling and Data Collection

The population of the study was undergraduate students of the Faculty of Management Studies and Commerce of the University of Jaffna, Sri Lanka. The data collection was conducted using online survey through Google Forms, and the structured questionnaire was distributed to the students' academic networking and social media accounts. Participation in the survey was voluntary and respondents were required to have experience with using ChatGPT in a university setting. The sample consisted of 650 undergraduate students. Since there were no invalid responses, the sample size was considered adequate for the analysis of structural equation models (Hair et al., 2012; Kline, 2011) testing the proposed structural research model.

3.4 Data Analysis Method

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the SmartPLS software. PLS-SEM is widely used in information systems and technology adoption research because it enables researchers to analyze complex models with multiple constructs and relationships simultaneously (Hair et al., 2012). According to structural equation modeling researchers (Anderson & Gerbing, 1988), the analysis procedure was conducted in two stages. First, the model should be evaluated, then it should be analyzed in terms of measurement model which is reliability and validity of the measures used for this study. The second step involved an analysis of the structural model to test the hypothesized relationships.

The measurement model was assessed using reliability statistics such as Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) estimates. Cronbach's alpha values above 0.70 suggest the items have satisfactory internal consistency reliability, and AVE estimates above 0.50 suggest satisfactory convergent validity (Hair et al., 2012). Discriminant validity (also known as divergent validity) was assessed with the Fornell-Larcker criterion, as well as HTMT. According to the Fornell–Larcker criterion, the square root of the AVE of each construct should exceed its correlation with other constructs in the model. Additionally, HTMT values below the recommended threshold confirm adequate discriminant validity between constructs (Fornell & Larcker, 1981; Henseler et al., 2016).

After confirming the reliability and validity of the measurement model, the structural model was evaluated to test the research hypotheses. Path coefficients, t-statistics, and p-values were analyzed to determine the significance of the relationships between constructs. Bootstrapping procedures were performed to estimate the statistical significance of the hypothesized paths.

3. 4 Hypothesis Development

3.4.1 Information Quality

Information quality refers to the accuracy, relevance, clarity, and usefulness of the information provided by a system. In technology-based learning environments, high-quality information encourages users to rely on the system for completing tasks and making decisions. In the context of generative AI, students often depend on ChatGPT for explanations, academic guidance, and problem-solving. Students will continue their regular use of ChatGPT and be increasingly satisfied with the system if they find information from the system as accurate and useful. The quality of information has previously been proven as a key factor in explaining system use and user satisfaction of information systems (DeLone & McLean, 2003).

Therefore, the following hypotheses are proposed:

H1: Information quality provided by ChatGPT has a significant impact on student achievability.

H2: Information quality provided by ChatGPT has a significant impact on user satisfaction.

H3: Information quality provided by ChatGPT has a significant impact on system use.

3.4.2 System Quality

System quality is a term used in information systems research that refers to how a system performs and functions. System quality includes usability, reliability, accessibility, and responsiveness. System quality for a ChatGPT system may include response time, user interface usability, and overall experience with the ChatGPT system. High system quality positively affects student satisfaction with the system, as students are likely to frequently use the system to perform academic tasks if they find it functional, reliable and easy to use.

Thus, the following hypotheses are proposed:

H4: System quality of ChatGPT has a significant impact on student achievability.

H5: System quality of ChatGPT has a significant impact on user satisfaction.

H6: System quality of ChatGPT has a significant impact on system use.

3.4.3 Service Quality

Service quality is defined as the quality of service that users receive when using a system. In information systems service quality refers to instructions, information technology (IT) support, and other resources available to support the user in performing tasks. Second, service quality, when it comes to ChatGPT, relates to the provision of advice, documentation, or support to assist students in successfully navigating the system. A favorable service environment, characterized by high service quality, is likely to increase the chances of students utilizing ChatGPT for academic purposes. Additionally, a positive service environment results in a higher ChatGPT satisfaction and academic performance.

Accordingly, the following hypotheses are proposed:

H7: Service quality of ChatGPT has a significant impact on student achievability.

H8: Service quality of ChatGPT has a significant impact on user satisfaction.

H9: Service quality of ChatGPT has a significant impact on system use.

3.4.4 Trust and Worthy

Trust is an important element for the acceptance and use of AI-based technologies. In contrast to conventional information systems, generative AI systems produce outputs based on probabilistic models of the system's credibility and reliability, rather than a fixed set of information elements. Based on the above hypotheses, once students perceive ChatGPT as an accurate and reliable source of information, they are more likely to adopt ChatGPT. This is because, when highly trusted, students will be more satisfied with using ChatGPT, and will be more encouraged and willing to use ChatGPT for explanations, research, and learning tasks, which will ultimately improve their academic performance.

Therefore, the following hypotheses are proposed:

H10: Trust and Worthy (TRU) provided by ChatGPT has an impact on student Achievability (ACH).

H11: Trust and Worthy (TRU) provided by ChatGPT has an impact on user satisfaction.

H12: Trust and Worthy (TRU) provided by ChatGPT has an impact on system use.

3.4.5 Self-confident

Self-confident is the belief that students can successfully use ChatGPT for academic purposes. When students are confident that they can use an AI tool, they are more likely to explore the tool and use it in their academic pursuits. Self-confidence increases students' willingness to use ChatGPT to support their academic work. This has a positive impact on their learning performance and academic achievements. It is expected that students with higher self-confidence to use the ChatGPT will be more satisfied and use the system more frequently. Therefore, self-confidence over the use of ChatGPT serves as an essential variable influencing student achievability, user satisfaction, and system use.

Therefore, the following hypotheses are proposed:

H13: Self-confident has a significant impact on student achievability.

H14: Self-confident has a significant impact on user satisfaction.

H15: Self-confident has a significant impact on system use.

3.4.6 System Use, Satisfaction, student achievability and Student Benefits

System use refers to the actual use of the ChatGPT system for academic purposes, such as using it to help with homework or assignments, find information on topics of interest, or explain a topic. High levels of system use show the belief on the part of the participants that the system is useful for academic purposes. User satisfaction means the overall evaluation of the students about the use of ChatGPT and their positive feelings while using this system. A helpful and easy-to-use system increases user satisfaction. The fourth dimension is student achievability, defined as the perceived attainability of the desirable improvement in students' academic studies and learning outcomes. Finally, student benefits relate to the perceived overall advantages of using ChatGPT from students' perspectives, such as the improved effectiveness of learning, understanding of course content, and academic performance. When taken together, these factors can therefore provide a measure of whether ChatGPT is actually supporting students.

Based on these relationships, the following hypotheses are proposed:

H16: System use of ChatGPT has a significant impact on student achievability

H17: System use has a significant impact on student benefits.

H18: Student achievability of ChatGPT has a significant impact on student benefits.

H19: User satisfaction has a significant impact on student achievability.

H20: User satisfaction has a significant impact on student benefits.

4. Results and Analysis

4.1 Demographic Analysis of Respondents

The demographics of the sample group indicate that the largest group of respondents were from the Northern Province (31.7%) followed by the North Central Province (17.2%), the Eastern Province (12.6%) and the Central Province (12%), with the remaining sample group being spread across other provinces in the country.

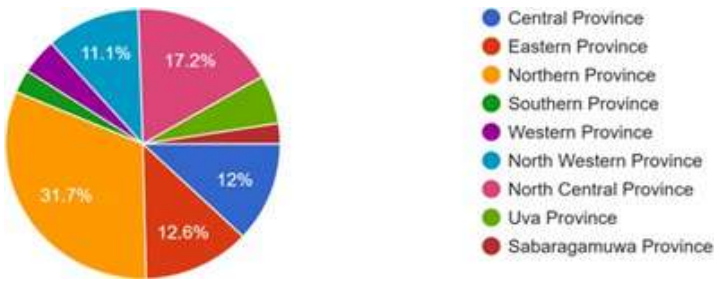


Figure 1: Distribution of Respondents by Province

Tamil and Sinhala-speakers are the two main language groups among the respondents. Tamil was reported as the mother tongue of 50.5% of the students while Sinhala was reported by 49.2%. However, none of the respondents reported English as their first language. This is consistent with the linguistic diversity of students in Sri Lanka, where the sample contained students from the two most populous language groups.

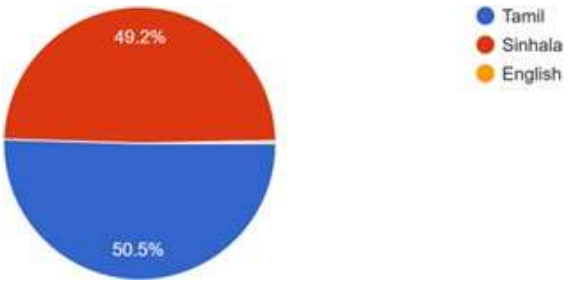


Figure 2: Distribution of Respondents by Mother Tongue

It was also found that students often used ChatGPT in English language, and that 71.7% of the students used ChatGPT to research and draft the information. Among students using ChatGPT in other languages, 16% used Sinhala and 12.3% used Tamil. One of the main reasons students preferred English was that most of the AI-based academic content and education materials were also available in English language. Furthermore, the results show that English is the medium of academic activities, opportunities and technology tools.

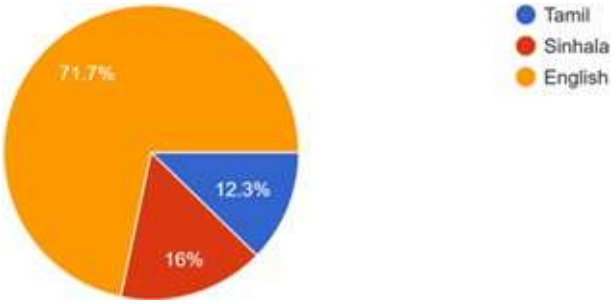


Figure 3: Language Used by Respondents When Interacting with ChatGPT

4.2 Structural Model Assessment and Model Validation

The structural equation model was analyzed using the PLS-SEM technique to examine the relationships between the constructs in the proposed framework. The model includes information quality (INQ), system quality (SYQ), service quality (SEQ), trust and worthiness (TRU), and self confident (SEC) as exogenous constructs influencing system use (USE), satisfaction (SAT), and student achievability (ACH). Furthermore, system use, satisfaction, and achievability were examined as predictors of student benefits (STB).

Table 1 shows that the reliability estimates for the latent variable constructs were found to be acceptable. Values of Cronbach's alpha coefficients were above the threshold value of 0.700. Thus, internal consistency is satisfactory. The internal reliability of the constructs, ACH (0.909), SAT (0.907) and STB (0.928), was very high, and was acceptable for INQ (0.796), USE (0.807), SYQ (0.844), SEQ (0.857), SEC (0.860) and TRU (0.874). The composite reliability values (rho_a and rho_c) for all constructs are above the recommended level of 0.700, confirming strong construct reliability. Furthermore, the Average Variance Extracted (AVE) values range between 0.711 and 0.873, exceeding the threshold value of 0.500, which confirms adequate convergent validity for all constructs. Overall, these results indicate that the measurement model demonstrates satisfactory reliability and validity, and all constructs are appropriate for inclusion in the structural model analysis.

Table 1. Reliability statistics (based on SmartPLS output)

	Cronbach's Alpha	**Composite Reliability (rho_a)**	**Composite Reliability (rho_c)**	**Average Variance Extracted (AVE)**
ACH	0.909	0.911	0.943	0.847
INQ	0.796	0.805	0.880	0.711
SAT	0.907	0.908	0.942	0.844
SEC	0.860	0.862	0.915	0.782
SEQ	0.857	0.857	0.913	0.777
STB	0.928	0.928	0.954	0.873
SYQ	0.844	0.844	0.906	0.762
TRU	0.874	0.880	0.922	0.798
USE	0.807	0.903	0.881	0.713

Source: Survey data by Researcher

The Fornell–Larcker criterion was used to assess discriminant validity. As shown in Table 2, the square root of the AVE for each construct was greater than its correlations with all other constructs. Specifically, the diagonal values for ACH (0.920), INQ (0.843), SAT (0.919), SEC (0.884), SEQ (0.882), STB (0.935), SYQ (0.873), TRU (0.893), and USE (0.844) exceeded the respective inter-construct correlation values. These findings confirm that each construct shares more variance with its own measurement indicators than with other constructs in the model. Therefore, the Fornell–Larcker criterion supports adequate discriminant validity of the measurement model.

Table 2. Discriminant Validity: Fornell-Larcker criteria (based on SmartPLS output).

	ACH	INQ	SAT	SEC	SEQ	STB	SYQ	TRU	USE
ACH	**0.92**								
INQ	0.494	**0.843**							
SAT	0.5	0.661	**0.919**						
SEC	0.717	0.574	0.592	**0.884**					
SEQ	0.512	0.737	0.708	0.593	**0.882**				
STB	0.778	0.473	0.545	0.626	0.504	**0.935**			
SYQ	0.476	0.774	0.709	0.581	0.763	0.497	**0.873**		
TRU	0.443	0.692	0.686	0.538	0.727	0.408	0.634	**0.893**	
USE	0.36	0.579	0.666	0.481	0.648	0.325	0.594	0.598	**0.844**

Source: Survey data by Researcher

Table 3. Heterotrait–monotrait ratio (HTMT) analysis (based on SmartPLS output).

	ACH	INQ	SAT	SEC	SEQ	STB	SYQ	TRU	USE
ACH									
INQ	0.579								
SAT	0.550	0.772							
SEC	0.811	0.690	0.668						
SEQ	0.579	0.892	0.802	0.690					
STB	0.847	0.546	0.593	0.701	0.564				
SYQ	0.544	0.942	0.809	0.682	0.898	0.562			
TRU	0.492	0.832	0.767	0.618	0.837	0.451	0.736		
USE	0.362	0.683	0.741	0.538	0.749	0.328	0.686	0.697	

Source: Survey data by Researcher

The discriminant validity of the measurement model was assessed using the Heterotrait–Monotrait Ratio (HTMT) criterion (Henseler et al., 2015). Most HTMT values were below the recommended threshold of 0.900, indicating acceptable discriminant validity among the majority of the constructs. However, the HTMT value between information quality (INQ) and system quality (SYQ) was 0.942, which exceeds the recommended threshold.

This finding suggests that information quality and system quality may not be sufficiently distinct constructs in the measurement model. In addition, the HTMT value between service

quality (SEQ) and system quality (SYQ) was 0.898, which is below but very close to the threshold and should therefore be interpreted with caution. Other relatively high values, including INQ–SEQ (0.892), SEQ–TRU (0.837), and TRU–INQ (0.832), remained below the 0.900 criterion. Overall, the results provide partial support for discriminant validity; however, the conceptual distinction and measurement items of information quality and system quality should be further examined, potentially using HTMT inference or item-level cross-loading analysis.

4.3. Path Coefficients and Structural Model Assessment

The constructs information quality (INQ), system quality (SYQ), service quality (SEQ), trust and worthiness (TRU), and self confident (SEC) explain 47.4% of the variance (R^2) in system use (USE). Furthermore, these constructs together with system use (USE) explain 53.4% of the variance in student achievability (ACH), while 62.8% of the variance in satisfaction (SAT) is explained by the preceding constructs in the model. The explained variance for student benefits (STB) reaches 64.3%, indicating a relatively strong explanatory power of the structural model. Overall, the results suggest moderate to substantial explanatory power of the proposed framework. Figure 4 presents the model results, including the outer loadings and significance levels for the measurement model as well as the path coefficients and significance levels for the structural model.

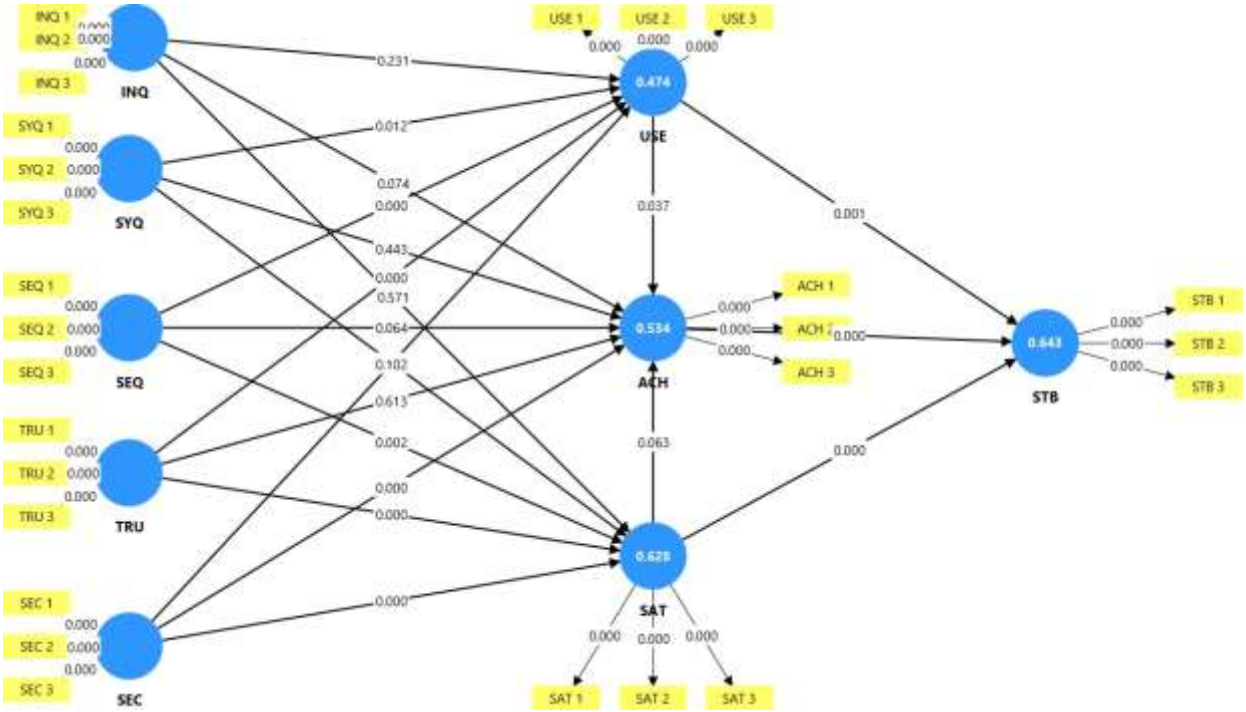


Figure 4. Path analysis results (SmartPLS output).

All factor loadings in this study were statistically significant at the 0.050 level, suggesting an adequate degree of reliability in the measurement model, whilst a number of significant relationships emerged in the structural model of the five constructs in the model, SEC has the largest total effect on ACH (β = 0.618, p = 0.000). SEC has a significant effect on SAT (β = 0.156, p = 0.000). SEQ has an important effect on USE (β = 0.298, p = 0.000) and SAT (β =

0.177, p = 0.002). It was found that system quality (SYQ) had an important influence on system use (USE) (β = 0.144, p = 0.012) and satisfaction (SAT) (β = 0.290, p = 0.000). It was found that trust and worthiness (TRU) significantly influenced system use (USE) (β = 0.208, p = 0.000) and satisfaction (SAT) (β = 0.268, p = 0.000).

The findings also expose that student achievability (ACH) has a strong important positive effect on student benefits (STB) (β = 0.678, p = 0.000), the strongest path in the model. Additionally, user satisfaction (SAT) has an important positive influence on student benefits (STB) (β = 0.272, p = 0.000). In contrast, USE was negatively associated with student achievability (ACH) (β = −0.093, p = 0.037) and student benefits (STB) (β = −0.100, p = 0.001), both important associations.

Table 4. Path coefficients and effect size for hypothesis testing (based on SmartPLS output).

	Path Coefficient	P values	T statistics	Decision
ACH -> STB	0.678	0.000	22.681	H18 Supported
INQ -> ACH	0.092	0.074	1.786	H1 Not Supported
INQ -> SAT	0.03	0.571	0.567	H2 Not Supported
INQ -> USE	0.063	0.231	1.197	H3 Not Supported
SAT -> ACH	0.100	0.063	1.856	H19 Not Supported
SAT -> STB	0.272	0.000	6.866	H20 Supported
SEC -> ACH	0.618	0.000	15.607	H13 Supported
SEC -> SAT	0.156	0.000	3.866	H14 Supported
SEC -> USE	0.073	0.102	1.638	H15 Not Supported
SEQ -> ACH	0.119	0.064	1.850	H7 Not Supported
SEQ -> SAT	0.177	0.002	3.174	H8 Supported
SEQ -> USE	0.298	0.000	5.331	H9 Supported
SYQ -> ACH	-0.046	0.443	0.767	H4 Not Supported
SYQ -> SAT	0.290	0.000	5.537	H5 Supported
SYQ -> USE	0.144	0.012	2.499	H6 Supported
TRU -> ACH	-0.024	0.613	0.505	H10 Not Supported
TRU -> SAT	0.268	0.000	6.405	H11 Supported
TRU -> USE	0.208	0.000	4.050	H12 Supported
USE -> ACH	-0.093	0.037	2.088	H16 Supported
USE -> STB	-0.100	0.001	3.217	H17 Supported

Source: Survey data by Researcher

Hypotheses were tested by examining the PLS-SEM output path coefficients (β), p-values and T-statistics. According to the threshold of PLS-SEM importance, if p-value less than 0.05 and T-statistic in absolute terms lies above 1.96, we can say that the hypothesis is supported, which means that the constructs are statistically correlated with each other. Hypotheses with a p-value

greater than 0.05 or a T-statistic less than 1.96 are not supported.

The results show that the information quality (INQ) is not significantly influencing the dependent variables. Information quality and student achievability (H1) also have an insignificant relationship (β = 0.092, p = 0.074, T = 1.786). Thus, the quality of information produced by ChatGPT did not improve students' academic achievability. The relationship between information quality and user satisfaction (H2) was not statistically significant (β = 0.030, p = 0.571, T = 0.567). Therefore, it was concluded that users' perception of the quality of information provided by ChatGPT did not have a statistically important effect on their satisfaction with using the system. In addition, information quality does not significantly influence system use (H3) (β = 0.063, p = 0.231, T = 1.197). Therefore, all of the information quality hypotheses (H1, H2, and H3) are not supported.

The path coefficient of the relationship between system quality (SYQ) and student achievability was not significant (H4). The state of the SYQ relationship with student achievability was β = −0.046, p = 0.443, T = 0.767, which means that the technical performance of ChatGPT did not significantly affect students' level of achievability. Furthermore, system quality has a significantly positive impact on user satisfaction (H5) (β = 0.290, p = 0.000, T = 5.537) and system use (H6) (β = 0.144, p = 0.012, T = 2.499). This means that students are more satisfied with the system if it is reliable and easy to use (H5) and are more likely to continue using ChatGPT if the system's performance is improved (H6). This only means that H5 and H6 are supported but H4 is not.

The SEQ results in H7 show that service quality (SEQ) does not significant influence student achievability (H7) (β = 0.119, p = 0.064, T = 1.850). Thus, the threshold requirement is not accepted according to its T-statistics. However, the impact on user satisfaction was positive and important in this regard (H8) (β = 0.177, p = 0.002, T = 3.174), which shows that adequate system service perceived by students will increase satisfaction in using ChatGPT. Meanwhile, the service quality significant affects the system use (H9) (β = 0.298, p = 0.000, T = 5.331), which means that students will use it when they perceive that service support for ChatGPT is acceptable. Therefore, H8 and H9 are supported, while H7 is not supported.

For the path H10 (TRU -> ACHV) there is no significant influence of the trust variable on the student achievement (στα = 0.505, t-value = 0.505, p = 0.613) (β = −0.024, p = 0.613, T = 0.505), indicating that trusting ChatGPT is not enough to improve student learning performance. For the paths H11 and H12, predicting the role of trust in the system satisfaction and the system use, the trust has a significant influence on the system satisfaction and system use, i.e., the more students trust ChatGPT the more they are satisfied with ChatGPT and motivated to use it (β = 0.268, p = 0.000, T = 6.405; β = 0.208, p = 0.000, T = 4.050). Therefore H10 is rejected, while H11 and H12 are supported.

Self-confident (SEC) has an important positive influence on students' achievability (H13) (β = 0.618, p = 0.000, T = 15.607). As a result, students who feel safe/ confident while using ChatGPT are likely to achieve better scores and high levels of achievement.

The result shows self-confident positively influences user satisfaction (H14) (β = 0.156, p = 0.000, T = 3.866). But the results indicate self-confident does not significantly influence system use (H15) (β = 0.073, p = 0.102, T = 1.638), possibly because students' confidence has no effect on how often the students use ChatGPT. It follows that H13 and H14 are supported, but not H15.

Another relationship is the negative influence of system use on student achievability (H16). The result is significant (β = −0.093, p = 0.037, T = 2.088). Another negative relationship is found between the use of the system and the academic benefit for students (H17) (β = −0.100, p = 0.001, T = 3.217). This shows that an increase in the use of a system is not necessarily associated with an increase in the students' academic performance. Thus, H16 and H17, are supported, despite the negative sign of the relationships.

The connections between the last outcome variables are also significant. Student achievability has a strong and positive effect on student benefits (H18) (β = 0.678, p = 0.000, T = 22.681). The path of academic achievability to perceived usefulness (H16), which is the strongest path in the model, indicates that increased academic achievability for students positively influences the perceived usefulness of ChatGPT. However, the path from user satisfaction to student achievability (H19) has insignificant (β = 0.100, p = 0.063, T = 1.856), implying that user satisfaction does not directly affect student achievement. User satisfaction was found to have a strong impact on student benefits (H20) (β = 0.272, p = 0.000, T = 6.866), as satisfied users experienced more benefits from ChatGPT than unsatisfied users.

Overall, the hypothesis testing found 11 hypotheses supported and 9 hypotheses not supported. The study found self-confident, and student achievability, to be important predictors of perceived use of ChatGPT. Accordingly, system quality, service quality and trust were the main predictors of user satisfaction and system use. However, information quality was not an important predictor of system use, satisfaction, and achievability, which implies that students may be more influenced by factors such as system reliability, trust and self-confident rather than information quality when using the tool.

Table 5. Total effects and indirect effects (based on SmartPLS output)

	Total effects	p	Total indirect effects	p
ACH -> STB	0.678	0.000		
INQ -> ACH	0.089	0.095	-0.003	0.720
INQ -> SAT	0.03	0.571		
INQ -> STB	0.062	0.154	0.062	0.154
INQ -> USE	0.063	0.231		
SAT -> ACH	0.1	0.063		
SAT -> STB	0.34	0.000	0.068	0.063
SEC -> ACH	0.627	0.000	0.009	0.353
SEC -> SAT	0.156	0.000		
SEC -> STB	0.46	0.000	0.46	0.000
SEC -> USE	0.073	0.102		
SEQ -> ACH	0.109	0.069	-0.01	0.527
SEQ -> SAT	0.177	0.002		
SEQ -> STB	0.092	0.034	0.092	0.034
SEQ -> USE	0.298	0.000		
SYQ -> ACH	-0.03	0.607	0.016	0.317
SYQ -> SAT	0.29	0.000		
SYQ -> STB	0.044	0.328	0.044	0.328
SYQ -> USE	0.144	0.012		
TRU -> ACH	-0.016	0.715	-0.063	0.632
TRU -> SAT	0.268	0.000		
TRU -> STB	0.041	0.238	0.041	0.238
TRU -> USE	0.208	0.000		
USE -> ACH	-0.093	0.037		
USE -> STB	-0.163	0.000	-0.063	0.037

Source: Survey data by Researcher

The total effects and indirect effects also highlight other important relationships between the model's constructs. Specifically, the total effect of student achievability (ACH) on student benefits (STB) is strong and important (β = 0.678, p = 0.000), suggesting that improvements in academic performance influence how students perceive the use of ChatGPT. The impact of user satisfaction (SAT) on student benefits was another important direct effect in the model (β = 0.340, p = 0.000), suggesting that students with higher user satisfaction were more likely to perceive the benefits of using ChatGPT in their learning environment. In addition, SEC showed one of the highest influences in the model, significantly affecting student achievability (β = 0.627), user satisfaction (β = 0.156) and student benefits (β = 0.460).

SEQ was significantly related to system use (β = 0.298), user satisfaction (β = 0.177), and indirectly to student benefit (β = 0.092). SYQ was significantly related to system use (β = 0.144) and user satisfaction (β = 0.290), but not to perceived achievability nor to student benefit.

Trust (TRU) was significantly related to system use (β = 0.208) and user satisfaction (β = 0.268), but not to perceived achievability nor to student benefit. No direct relationship was found between information quality (INQ) and perceived achievability, user satisfaction, system use, or student benefits. However, the negative direct effect of system use (USE) on student achievability (β = −0.093) and student benefits (β = −0.163) suggests that using ChatGPT may not necessarily result in improved student performance. Overall, self-confident, student achievability, and user satisfaction are the best predictors of student benefits; whereas, system quality, service quality, and trust are the most significant predictors of intermediate outcomes of user satisfaction and system use.

This study contributes to the understanding of university students' acceptance and use of ChatGPT. The results revealed that system quality, service quality, trust, and self-confidence significant role in the university students' experience with ChatGPT, providing valuable insights into the factors affecting ChatGPT acceptance. In detail, self-confident was the strongest predictor positively influencing student achievability, indicating that students who have high self-confident with respect to the use of AI technologies will have better academic performance. Furthermore, system quality, service quality, and trust and worthy positively influenced user satisfaction and system use and consequently motivated students to use AI-based learning tools through the provision of reliable systems and a helpful learning environment. On the other hand, information quality has no important effect on system usage, system satisfaction, and system achievability. This result implies that the students utilize ChatGPT regardless of its information quality due to their trust in the system and self-confident in the use of the ChatGPT system. We also find that student achievability and user satisfaction have an important positive effect on student benefits, which means that the student experience influences the educational value of using the ChatGPT system. This research underscores the importance of technology and psychology in the successful implementation of AI technologies in higher education.

5. Conclusion

Based on information systems acceptance theories, particularly Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT), this study examines the factors influencing undergraduate students' acceptance and use of ChatGPT in higher education. TAM and UTAUT propose that system characteristics, trust, and self-confident significantly affect an individual's intention to use technology within an educational context. In line with this theory, empirical evidence shows that system quality, service quality, trust, and self-confident positively impact students' satisfaction and intention to use ChatGPT for educational purposes. Further, the study found that student achievability and user satisfaction had a positive impact on perceived learning value of ChatGPT. This is consistent with other studies on technology acceptance which found that perceived reliability, perceived usefulness and perceived ease of use of digital technology would lead to perceived learning outcomes and future behavioral intention from students. A key finding is a significant link between self-confident and academic performance as well as perceived usefulness of AI-based learning tools, suggesting that students with high self-confident tend to perform better academically, and find value in using AI-based learning tools.

The study shows that the development of a positive relationship between ChatGPT usage and educational outcomes relies on the reliability of the system, institutional support, and students' digital competence. With correct support and guidelines for responsible generative AI usage, universities can ease confidence in and effective use of generative AI systems. Overall, this study contributes to the literature examining the adoption of AI within the context of higher education and universities in Sri Lanka. Future research could consider how concepts such as ethics and digital literacy, as well as emerging generative AI technologies, might affect students' learning outcomes and technology adoption in educational contexts.

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