Educational Administration: Theory and Practice
2024, 30(02), 1756 - 1763
ISSN: 2148-2403
https://kuey.net/

Research Article

Revealing the Factors Behind University Students' Loyalty towards ChatGPT

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Citation: Mohd Zaini, M. Z. & Abdul Aziz K. (2024), Revealing the Factors Behind University Students' Loyalty towards ChatGPT, *Educational Administration: Theory and Practice*, 30(02) 1756 - 1763
Doi: 10.53555/kuey.v30i2.8848

ARTICLE INFO

ABSTRACT

The trend towards the adoption of consumer-facing AI is anticipated to increase given ChatGPT's enormous popularity. Since its launch, ChatGPT has generated significant debate surrounding potential issues. Several factors identified to influence user loyalty. Hence the study aims to examine the influence of satisfaction, service quality and trust towards ChatGPT user loyalty. 216 students from the top technical university in Malaysia responded the survey via online platform. The data were analysed through PLS-SEM software and the result found that satisfaction, service quality and trust showed significant and positive influence on ChatGPT user loyalty. Theoretically, this study contributes valuable empirical insights into the determinants of user loyalty, specifically within the context of AI-driven platforms like ChatGPT. From a practical standpoint, the findings offer actionable guidance for ChatGPT creators, highlighting key areas such as trust-building, user satisfaction, and content quality that should be prioritized to foster and sustain long-term user loyalty

Keywords: *Trust, Satisfaction, Loyalty, Service Quality, ChatGPT*

Introduction

An artificial intelligence (AI) chatbot is a dialogue system that uses machine learning, large data analysis, and natural language comprehension (Cheng, Bao, Zarifis, Gong, & Mou, 2021; Lee, Pan & Hsieh, 2021). AI-embedded systems can improve the efficacy and efficiency of activities. Some AI chatbots have more specialised skills than human employees, such as knowledge acquisition, memory, and calculating, thanks to AI technology. Management researchers are paying greater attention to frontline AI chatbots as businesses utilise them more widely and intensively. AI chatbots offer round-the-clock support and efficiently respond to inquiries, saving businesses money (Ashfaq, Yun, Yu, & Loureiro, 2020). They exhibit human-like cues in name, identification, empathy, and friendliness as well as visual and natural language communication. (Cheng et al., 2021)

Chat Generative Pre-Trained Transformer (ChatGPT), like other AI applications, has altered how users think, act, and live in the post-pandemic period. ChatGPT responds to almost all queries from users right away. The application of consumer-facing AI is predicted to become more prevalent as a result of ChatGPT's enormous popularity. As more and more AI-enabled service employment enters the market, the service sector is changing dramatically (Huang & Rust, 2018). Since its debut, ChatGPT has sparked a lot of discussion about possible problems (Paul, Ueno, & Dennis, 2023). When looking for trustworthy information on a person or product, buyers may worry about the reliability of AI (Ghazwani, Esch, Cui, & Gala, 2022). Chat GPT can produce language that is not fact-based, and in some situations, the model may provide information that is inaccurate or deceptive.

Artificial intelligence raises ethical issues for society, including privacy concerns. As stated by Hsu and Ching (2023), data privacy is also of significant concern, as users could provide various types of input that may include sensitive personal information, particularly in the case of students and minors. Artificial intelligence chatbots must also address the issue of fake news. There is a danger that incorrect information or fake news may spread through chatbots since they can generate and exchange content. This might have very detrimental implications because chatbots have the ability to quickly reach a large audience (Yalalov, 2023). ReviewNPrep (2023) brings out a further problem, which is that AI like ChatGPT could not always comprehend the context of the instructions it gets, which might result in improper replies. Users do not always receive the response they

desire, in other words. This could lead to unfavourable consumer feedback, such as poor satisfaction, and harm the brand's reputation.

Past researchers claimed that consumer is more likely to show positive behavioral intentions, such as loyalty when they perceive a product or service as good (Hsu & Ching,2023; Chen & Chou, 2019). User loyalty refers to users' continued preference and support for a brand or product, and is usually associated with user satisfaction, usefulness and other factors. User loyalty not only affects users' repeat usage and recommendation behavior, but also influences users' feedback and improvement opinions on generative AI products and services, thus affecting the quality and innovation of generative AI products and services (Zeng, Cheng & Wang, 2023). Perceived quality is considered one of the factors the influence user loyalty. The perceived quality of AI has a huge impact on consumers' perceptions of the services or product since they may be the first thing that customers interact with. As stated by Maklan et al. (2017), consumers' opinions of great service quality, it has been found in research influence consumer loyalty. In the case of AI services, this chain model of the relationship between service quality and consumer loyalty presents different level of difficulties.

Previous studies also have investigated other factors such as satisfaction (Crolic, Thomaz, Hadi, and Stephen, 2022), trust (Chen et al., 2020) to an AI chatbot on loyalty. However, there is not enough empirical research that look in the context of AI, despite the fact that previous studies have noted that these factors may influence loyalty. Based on Chen, Lu, Gong & Xiong (2022), there are gaps that need to be highlighted in the AI research area. First, prior research described the quality of AI chatbot services using the frameworks of traditional information system qualities, such as assurance, responsiveness, dependability, interaction, utility, and simplicity of use. These qualities, nevertheless, are broad and do not accurately describe an AI chatbot. Second, while examining the antecedents of customer loyalty in the context of AI services is important for organisations, the research of consumer loyalty for AI services is still unclear. Chen et al. (2022) also recommends that more studies look into antecedents such as service quality and trust.

Although there are increasing amount of studies on chatbots, the factors of user satisfaction and loyalty are still limited. Additionally, the existing literature lacks studies that provide a comprehensive understanding of the relationship between satisfaction, and loyalty among ChatGPT user (Niu &Mvondo, 2024). Hence, the study aims to examine the influence of satisfaction, service quality and trust on students' loyalty towards AI ChatGPT.

Literature Review and Hypotheses Development

According to Oliver (1999), customer loyalty as a fervent promise by the consumer to repurchase products or services. Although the environment and marketing initiatives will have an impact on how a product is used in the future, conduct may change. Another researcher, Dick & Basu (1994) define loyalty as a person's attitude towards a certain thing such as a product, service, establishment, or seller.

Past studies have investigated factors influencing user's loyalty and among of the factors are satisfaction. Satisfaction can be referred as "a person's feeling of pleasure or disappointment" based on how well a product performs (or performs) in comparison to the user's expectations (Kotler, 2006). Customers will be unhappy if performance falls short of expectations. Customer satisfaction is ensured if performance fulfils expectations. Customers will be extremely delighted or happy if performance exceeds expectations. Meanwhile, other researcher specifically Cadotte, Woodruff, and Jenkins (1987) stated that satisfaction can be referred as sensation that results from an assessment of the usage experience.

Sarkar et al. (2020) posited in a research on mobile commerce that customer satisfaction with technology correlates positively with loyalty and continued service use over time. In their study on customer service chatbots, Hsu and Lin (2023) discovered that user satisfaction had a positive effect on loyalty. Chen and(2022) attempted to investigate how client satisfaction affects customer loyalty towards AI Service. The results showed that customer satisfaction have a positive significant on customer loyalty. Suroso and Wahjudi (2021) claimed that customer loyalty to a product increase with satisfaction. A business can lessen the likelihood that customers will wish to switch to other products or businesses when it can satisfy customers and effectively meet their expectations. Ozkan, Süer, Keser, and Kocakoç (2020) found that customer loyalty was positively influenced by customer satisfaction.

Similarly Kusumawari & Rahayu (2019) revealed that that customer satisfaction significantly influence customer loyalty. In similar vein, Zhong and Moon (2020) indicate that customer satisfaction can lead to a sense of loyalty. The results also showed that satisfaction could have positive effects on loyalty. According to Hsu and Lin (2023), contentment determines a user's loyalty to AI chatbots. To echo previous research findings, the present findings hypotheses that:

H1: Satisfaction positively influence user loyalty toward AI ChatGPT

Another factor that influences user loyalty is service quality. In a study conducted by Özkan, et al. (2020), they found that loyalty is favorably and immediately influenced by service quality. Similarly, Dam and Dam (2021) claimed that the results demonstrated that customer loyalty is positively impacted by service quality. In another study conducted by Budianto et al. (2021), their study examined the influence of customer loyalty by service quality and it was revealed that that service quality positively influence customer loyalty. Fida, Ahmed, Al-Balushi and Singh (2020) had exmined the effects of service quality on customer loyalty for a few key Islamic financial institutions in Oman, and it was found that service quality is significantly influence loyalty.

Prentice, Lopes and Wang (2020) also found that employee service quality demonstrated a significant direct on customer loyalty. Likewise, Hsu & Lin (2023) also revealed that the service quality influence loyalty towards AI chatbots. The hypothesis is developed based on past literatures is as follows:
H2: Service quality positively influence user loyalty toward AI ChatGPT

Choudhury, and Shamszare (2023) found that that trust is critical to users' adoption of ChatGPT. Aoki (2020) looked into the public's early confidence in AI chatbots in research and the finding indicated there was trust significantly and positively effect loyalty. Similarly, Chen et al. (2022) revealed the influence of trust on customer loyalty towards AI Service. Customer loyalty is positively and significantly impacted by fluctuating customer trust, according to the study findings conducted by Lie, Sudirman, Efendi, & Butarbutar (2019). This suggests that when consumers have confidence in a service or product, they are more likely to remain loyal to it.
Likewise, as stated by Hasan, Shams, and Rahman (2021) trust is critical factor in consumer behaviour. Sharing sensitive personal information is important when evaluating the adoption and utilisation of information technology. The study tested the hypothesis that one's degree of
trust greatly influences brand loyalty, and it was discovered that trust in the Siri application had a considerable beneficial impact on brand loyalty.
Based on the findings from past studies, hence the hypothesis was developed as follows:
H3: Trust positively influence user loyalty toward AI ChatGPT

The conceptual framework is developed as **Figure 1:**

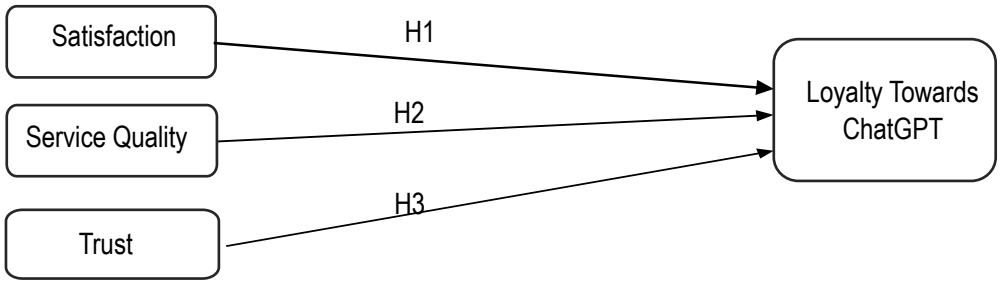

Figure 1. Conceptual Framework

RESEARCH METHODOLOGY

This study utilized a quantitative and cross-sectional research design to achieve the objectives. The respondents of this study are students from the top technical university in Malaysia who utilize AI Chatbox, specifically ChatGPT. The convenience sampling technique was used in the study as it is easy and affordable, as well as the subjects are accessible. The design is preferred as it is simple to measure and analyze the data obtained from the survey.
This research used online survey questionnaires for data collection, with respondents completing the questionnaire using Google Forms. The instruments for this study were adapted from well-established scales to ensure reliability and validity in measuring the constructs of satisfaction, service quality, trust, and user loyalty. Satisfaction was measured using the Customer Satisfaction Scale (CSS) developed by Oliver (1980). Service quality was assessed using instrument developed Boulding, Kalra, Staelin and Zeithaml (1993). trust was measured using the Trust Scale developed by Morgan and Hunt (1994). Finally, user loyalty was measured using the Loyalty Scale by Zeithaml, Berry, and Parasuraman (1996). Additionally, PLS-SEM software used to analyse the findings and based on the software, the data analysis includes two parts; measurement model evaluation and structural model evaluation.

RESULTS

216 respondent completed the survey and the data were analyzed. **Table 1** showed the demographic information of respondents which consists of 6 questions. Demographic analysis is to determine the frequency of respondents on measures in terms of age, gender, year of study and education level. A majority of the respondents were from male (59.7%) compare to female (40.3%). More than half percentage of respondent (54.2%) are among fourth year student, aged between 22 to 25 years old (50.9%), and currently in bachelor degree level (64.4%). **Table 1** below shows the detailed of demographic profile with frequency and percentage.

Table 1: Demographic Profile of Respondents

Information		Frequency	Percentage
1	**Age**		
	18 – 21	105	48.6
	22 – 25	110	50.9
	26-29	1	0.5
	30 and above	-	-
	Total	216	100
2	**Gender**		
	Male	129	59.7
	Female	87	40.3
	Total	216	100
3	**Year Of Study**		
	Year 1	20	9.3
	Year 2	20	9.3
	Year 3	59	27.3
	Year 4	117	54.2
	Total	216	100
4	**Education level**		
	Foundation	42	19.4
	Diploma	35	16.2
	Degree	139	64.4
	Total	216	100

Convergent Validity

Convergent validity examines how well two measures represent a shared notion. Alternative measurements with poor convergent validity create ambiguities that make it difficult to evaluate study results (Carlson & Herdman, 2012). Convergent validity is more complex since it examines how well hypotheses of relationships between constructs retain up on the field of study. To prove convergent validity based on studies, have to show a positive correlation between related concept measures. First, the outer loadings are critical indicators that show the movement of the latent variable towards the observable variables. For outer loading, an outside loading value of 0.5 or above for a measurement item is deemed acceptable, whereas a value greater than 0.7 is considered exceptionally satisfactory.

Convergent validity assesses the extent to which two measurements accurately reflect a common construct. Alternative measurement without robust convergent validity generates uncertainties that complicate the assessment of research outcomes (Carlson & Herdman, 2012). To establish convergent validity via research, one must demonstrate a positive association across measurements of related constructs. The outer loadings are essential indicators that demonstrate the relationship between the latent variable and the observable variables. For outer loading, a value of 0.5 or above for a measurement item is regarded as acceptable, while a value of 0.7 is exceptionally satisfactory.

Table 2: Outer Loadings

	L	S	SQ	T
L1	0.873			
L2	0.753			
L3	0.792			
L4	0.761			
S1		0.790		
S2		0.975		
SQ1			0.856	
SQ4			1.071	
T1				0.743
T2				0.552
T4				0.577

Table 2 show the outer loading of the items. Based on the table, all outer loading values are greater than 0.5 and considered acceptable except for the item S3, S4, S5, SQ2, SQ3, T3 and T5 in which the values are below than 0.5. Therefore, the item was removed from the model (Refer to **Table 2**).

Table 3: Measurement Model

Constructs	Items	Loadings	α	Composite reliability	Average variance extracted (AVE)
Loyalty (L)	L1	0.873	0.872	0.874	0.634
	L2	0.753			
	L3	0.792			
	L4	0.761	0.870	0.880	0.788
Satisfaction (S)	S1	0.790			
	S2	0.975			
Service Quality (SQ)	SQ1	0.856	0.957	0.969	0.940
	SQ4	1.071			
Trust (T)	T1	0.743	0.648	0.660	0.597
	T2	0.552			
	T4	0.577			

Convergent validity implies that the average variance extracted (AVE) exceeds 0.5. The Average Variance Extracted (AVE) is calculated by summing the squared loadings of all indicators associated with a certain construct. Table 3 indicates that the AVE exceeds 0.5, indicating that all values are acceptable. The composite reliability value for loyalty is 0.874. The reliability coefficients for the independent variables, satisfaction, service quality, and trust are 0.880, 0.969, and 0.660, respectively. All reliability coefficients exceed 0.6.

Discriminant Validity

Discriminant validity refers to the extent to which a latent variable can differentiate between various groups. In specific contexts, the term "discriminant validity" is used interchangeably with "divergent validity." Furthermore, discriminant validity is the measure of how well one construct can be distinguished from another based on specific empirical criteria. Henseler, Ringle, and Sarstedt (2015) proposed an alternative method for assessing discriminant validity using the Heterotrait-Monotrait Ratio (HTMT). Consequently, this study employed the HTMT to evaluate its discriminant validity. According to the results, the HTMT value must be below 0.9 to establish discriminant validity. **Table 4** shows that every value is below the necessary threshold HTMT value of 0.90 that Gold (2001) recommends. This result suggests that the study's constructs have proven discriminant validity.

Table 4: Discriminant validity result (HTMT ratio)

	L	S	SQ	T
L				
S	0.520			
SQ	0.565	0.784		
T	0.651	0.624	0.641	

Hypotheses Testing Result

Table 5 showed the result for three hypotheses developed in this study. According to Hair, Risher, Sarstedt, (2019), the R^2 value for loyalty is 0.741, indicating a substantial model. Meanwhile, the limits for assessing the effect size (f^2) values are 0.02 as small, 0.15 as medium, and the value of 0.35 as large. The f^2 result shows that satisfaction (0.071) and trust (0.89) have a large effect while service quality (0.19) have medium effect in producing R^2 for loyalty.

Hypothesis 1, which proposed that satisfaction positively influences loyalty, was confirmed with a significant positive effect ($\beta = 0.449$, $p < 0.05$), indicating that higher satisfaction levels lead to increased user loyalty. Similarly, Hypothesis 2, suggesting that service quality positively influences loyalty, was also supported, with service quality showing a significant positive influence ($\beta = 0.248$, $p < 0.05$) on loyalty. Lastly, Hypothesis 3, which proposed that trust positively influences loyalty, was strongly supported as well, with trust having the highest positive influence on loyalty ($\beta = 0.573$, $p < 0.05$). Overall, the findings demonstrate that satisfaction, service quality, and trust all play crucial roles in fostering user loyalty, with trust having the strongest influence among the three

Table 5: Significance of hypothesized relationships (direct)

Path	VIF	*β*	SD	*t* -value	*p* -value	Confidence Interval		(f^2)	R^2	Decision
						LL	UL			
H1: S → L	1.091	0.449	0.079	5.694	0.000	0.319	0.578	0.71	0.741	Supported
H2: SQ→ L	1.221	0.248	0.081	3.072	0.001	0.113	0.378	0.19		Supported
H3: T → L	1.130	0.573	0.071	8.027	0.000	0.459	0.691	0.89		Supported

* Note. SD = Standard Deviation, LL = Lower Limit, UL = Upper Limit, VIF = Variance Inflation Factor

DISCUSSION

This study is conducted to examine the factors influencing university students' loyalty towards Artificial Intelligence (AI) Chat GPT. Therefore, this research has been proposed and tested total 3 hypotheses. The outcome of results shows that all hypotheses were supported. Referring the research objective one, this study revealed that satisfaction has positively influence loyalty towards ChatGPT. It indicates high satisfaction enhance university student's loyalty to use ChatGPT. Current study tends to agree with the study of Chen et al. (2022) which revealed that customer satisfaction have a positive significant on customer loyalty. When a goods or services successfully meets and exceeds user expectations, it might reduce the chance that they will want to switch to other goods or services. This current study also in line with study conducted by Özkan et al. (2020), Kusumawari and Rahayu, (2019) as well as Zhong and Moon (2020) in which customer satisfaction was discovered to have a direct positive impact on customer loyalty.

Second objective of this study is to examine influence of service quality on user loyalty towards AI ChatGPT among students and this study found that service quality has positively influence loyalty towards ChatGPT. This finding was supported by Dam and Dam (2021) in which the results demonstrated that customer loyalty is positively impacted by service quality. It also aligned with study conducted by Budianto (2021) where it was found that service quality positively affects customer loyalty. High service quality in the context of ChatGPT is shown by the chatbot's capacity to provide accurate, relevant and responsiveness. When consumers encounter consistently high-quality encounters with ChatGPT, characterized by the provision of useful and correct information with minimum errors, they are more inclined to trust and stay loyal to the service.

Lastly, the third objective of this study to examine influence of trust on user loyalty towards AI ChatGPT. This study found that trust significantly influences on user loyalty towards AI ChatGPT among university students. This means when the student has higher trust, it enhances student's loyalty towards ChatGPT. Result of this also study is similar with past studies conducted by Aoki (2020) and Chen et al (2022) where the finding revealed that there is a positive effect of trust on loyalty. Trust plays a crucial role in fostering ChatGPT user loyalty by creating a sense of confidence and reliability in the platform. When users trust ChatGPT, they believe that the chatbot will provide accurate information which encourages continued usage. Studies have indicated that users are more likely to develop loyalty towards a service when they trust the technology and the provider, believing that their interactions are secure and their data is handled responsibly.

CONCLUSION

It was stated that the enhanced capabilities and interactive nature of AI tools like ChatGPT have the potential to revolutionize the area of consumer research. Satisfaction, service quality and trust are considered crucial factors in determining user loyalty towards ChatGPT. Users who are satisfied with their overall experience of interacting with ChatGPT, including the quality of responses and the ease of use, are likely to develop a strong sense of loyalty towards the AI tool. Additionally, users who have a high level of trust in the AI tool, perceiving it as dependable and secure, are more inclined to demonstrate loyalty.

This research makes numerous significant contributions to the comprehension of the factors that influence the loyalty of ChatGPT users. Initially, it offers empirical evidence that substantiates the importance of contentment, service quality, and trust in fostering user loyalty in the context of AI-driven platforms. The study's results underscore the significance of these three factors in promoting long-term engagement with ChatGPT, with trust being the most influential component. In addition, the research contributes to the expanding corpus of knowledge on user behavior in the context of artificial intelligence and offers valuable insights for businesses and developers seeking to improve user retention. The study provides actionable guidance for enhancing the overall user experience and increasing consumer loyalty on AI platforms by validating the impact of satisfaction, service quality, and trust.

Despite the fact that this investigation offers valuable insights, it is not without its drawbacks. The study is cross-sectional, which means that it only captures user perceptions at a singular point in time and does not consider changes in user behavior or attitudes over time. Longitudinal research would offer a more comprehensive comprehension of the long-term impact of trust, satisfaction, and service quality on loyalty. Secondly, the sample may not be a comprehensive representation of the entire ChatGPT user base, as it may be restricted to specific demographics or regions. In order to improve the generalizability of the findings, future research should strive for larger and more diverse sample sizes. In addition, the investigation prioritizes three variables (trust, service quality, and satisfaction); however, other variables, including perceived value, personalization, and convenience of use, may also impact loyalty and should be taken into account in future research.

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