

USER GRATIFICATION WITH ARTIFICIAL INTELLIGENCE FEATURES: A CASE STUDY OF CHATGPT AMONG MAINLAND CHINESE STUDENTS IN MALAYSIA

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Abstract

This study explores how Chinese international students in Malaysia experience satisfaction when using ChatGPT, an AI chatbot, based on the Uses and Gratifications (U&G) theory. It builds on and refines the framework proposed by Cheng and Jiang (2020) by examining the relationship between five core AI features, which include productivity enhancement, content generation, customer service automation, support and motivation, and collaboration facilitation. These features are analyzed in relation to four types of user gratification: modality, agency, interactivity, and navigability. A quantitative survey method was employed, with data collected from 54 Chinese students via an online questionnaire. Statistical analysis using SPSS confirmed that all five ChatGPT features positively correlate with the four gratification types. Among these, collaboration facilitation consistently emerged as the strongest predictor in most models. Navigability-based gratification showed the highest explanatory power, suggesting that users value smooth, intuitive interface experiences supported by task efficiency and responsiveness. While support and motivation had the smallest effect sizes, they remained statistically significant, highlighting the role of emotional reinforcement in AI-mediated interactions. These findings extend Sundar and Limperos' (2013) gratification model into the domain of AI chatbots and confirm that satisfaction is shaped not only by access to information but also by interaction quality, cognitive ease, and creative agency. This study offers cross-cultural validation of the U&G theory and highlights ChatGPT's potential as a multifaceted educational tool.

Keywords: Artificial Intelligence, Chatbots, ChatGPT, Uses and gratification theory

Kepuasan Pengguna terhadap Ciri-ciri Kecerdasan Buatan: Kajian Kes ChatGPT dalam Kalangan Pelajar China Tanah Besar di Malaysia

Abstrak

Kemunculan chatbot berasaskan kecerdasan buatan umum (AGI) telah meningkatkan pengalaman dan penglibatan pengguna dalam interaksi manusia-komputer secara signifikan. Tahap kepuasan pengguna mungkin berubah-ubah bergantung pada ciri dan fungsi unik yang ditawarkan oleh setiap chatbot. Kajian ini menggunakan Teori Kegunaan dan Kepuasan (Uses and Gratification Theory, U&G) untuk memperkemas dan menambah baik kerangka yang dibangunkan oleh Cheng dan Jiang pada tahun 2020. Melalui mod komunikasi manusia-mesin secara masa nyata, ChatGPT membolehkan pengguna mengelakkan realiti dan dinamik sosial yang rumit. ChatGPT menggabungkan model soal jawab daripada pelbagai bidang bagi menyediakan perkhidmatan yang lebih baik berbanding teknologi AI terdahulu. Tujuan kajian ini adalah untuk menilai corak penggunaan dan tahap kepuasan terhadap ciri-ciri AI. Chatbot AGI sebagai media baharu mempunyai keupayaan tinggi dalam melaksanakan arahan dan berinteraksi dengan manusia. Kajian ini menganalisis lima aspek utama dalam AGI dan mencadangkan empat bentuk kepuasan pengguna. Ia juga membandingkan kumpulan pengguna ChatGPT dari segi tahap kepuasan terhadap atribut AGI. Kajian ini menggunakan pendekatan kuantitatif melalui tinjauan atas talian melibatkan 60 pelajar China di Malaysia, dengan analisis dilakukan menggunakan perisian SPSS.

Kata Kunci: *Kecerdasan Buatan, Chatbot, ChatGPT, Teori Kegunaan dan Kepuasan*

Introduction

AI has increasingly influenced daily life through established technological methods. Media development has evolved from broadcasting and television to the modern internet, transitioning from Web 1.0 to Web 5.0. Artificial General Intelligence (AGI) is a developing domain focused on creating cognitive systems with autonomous reasoning abilities. These systems are designed for adaptability and demonstrate intelligence that is equivalent to, and possibly surpasses, human cognitive abilities (Shubernetskaya et al., 2017). Chatbots are presently the epitome of artificial intelligence systems.

The uses and gratification hypothesis delineates five distinct attributes of AI chatbots: augmenting productivity, producing content, automating customer service, providing support and incentive, and facilitating collaboration. The audience employs the features of artificial intelligence chatbots for their designated function. It obtains the following forms of reward: modality-based satisfaction, agency-based gratification, interactivity-based gratification, and navigability-based gratification.

With the advancement of media technology, the audience achieves their objectives by employing the widely utilized ChatGPT. This study examines the innovation and transformation of chatbots in the education sector, namely among college students. ChatGPT has engaged an audience, especially university students, throughout the previous two years. This study will utilize Uses and Gratifications theory as a framework to examine audience analysis regarding the use and satisfaction of ChatGPT among Chinese international students in Malaysia. This study clarifies the attitudes and satisfaction responses of Chinese foreign students regarding AGI chatbots.

Literature Review

The advent of artificial intelligence has accelerated the integration and transformation of the industry, markedly improving the efficiency and precision of industrial operations continuously. The term "artificial intelligence" (AI) refers to a computer's or robot's capacity to emulate human intelligence. Artificial intelligence empowers computers and robots to make decisions and solve problems in a manner that mimics human intellect. Artificial intelligence enables machines to reason and make independent judgments. Artificial intelligence (AI) has revolutionized the landscape by permeating nearly every facet of human existence and producing unprecedented productivity in the corporate sector. The proliferation of Internet-connected gadgets is the primary driver of this industry expansion. Improvements have been made in the execution of company activities. Improved data collection and predictive models allow management to obtain a more profound understanding of their customers.

The media and entertainment business is rapidly becoming one of the foremost adopters of AI, alongside industries such as healthcare, banking, and e-commerce (Su et al., 2023). Previous research has shown that the eight principal domains of AI application in media can

enhance predictive, perceptual, and cognitive capabilities (Agrawal et al., 2019; Brynjolfsson & McAfee, 2017). Certain software is specifically developed for media consumers (the supply side), while others concentrate on internal operations and strategies—the demand side. Furthermore, numerous elements are uniquely relevant to content distributors (e.g., content discovery), while others are applicable to both parties (e.g., audience engagement/insights, enhanced experience, and message optimization). Artificial intelligence has revolutionized and reconfigured social media in various unique manners. Nearly all individuals utilize social media for a legitimate purpose: it serves as a source of reliable information. Artificial intelligence and its recent advancements function as a remarkable tool for comprehending customer preferences and behaviors (Su et al., 2023).

Technology is integral to both industrial operations and daily activities. It has multiple roles and is implemented variably in various locations worldwide. Recently, the general public has been captivated by Artificial Intelligence. Artificial Intelligence replicates human cognitive functions. AI chatbots are increasingly supplanting human responses with this software to achieve greater accuracy and a more authentic semblance of human interaction. A chatbot is a software application that serves as an intermediary between humans and automated systems. It is a virtual assistant that has gained significant popularity in recent years, mostly due to advancements in artificial intelligence, machine learning, and other fundamental technologies such as neural networks and natural language processing. These chatbots proficiently engage in conversations with any individual. AI chatbots are classified into three categories: menu/button-based chatbots, keyword recognition-based chatbots, and contextual chatbots (Gupta & Hathwar, 2020). ChatGPT is the latest innovation in contextual robotics driven by artificial intelligence.

AI feature

Improve productivity

This study will largely analyze ChatGPT, classifying its attributes into five categories. Fauzi et al. (2023) assert that ChatGPT, a language model developed by OpenAI, can augment student productivity in multiple ways. ChatGPT employs a database retrieval mechanism to efficiently filter and summarize user comments, delivering the audience the most compelling feedback. Chatbots can offer essential information and resources to students, particularly undergraduates and master's candidates, while improving language skills and augmenting efficiency

and effectiveness. ChatGPT aids students in obtaining essential knowledge for their assignments and projects (Kasneci et al., 2023) by connecting them with subject matter experts. Moreover, ChatGPT can serve as a language model to aid pupils in enhancing their linguistic abilities. ChatGPT aids pupils in several language skills, including grammar, vocabulary, and writing (Cotton & Shipway, 2022). Thus, the productivity enhancement features of ChatGPT can satisfy the cognitive needs of the audience for knowledge, information, and facts. The audience aims to acquire fundamental knowledge and scholarly comprehension using chatbots to improve task execution and work efficiency.

Content generation

Secondly, captions, hashtags, and posts represent many forms of content that can be generated via ChatGPT (Biswas, 2023). As a cutting-edge artificial intelligence language model, ChatGPT provides assistance on diverse topics, including essays, articles, poetry, and translation projects. Moreover, it is a language model trained on matched text datasets generated by humans and artificial intelligence on the same topics, proficient in recognizing text authored by artificial intelligence. ChatGPT has received extensive training in textual data, allowing it to understand and produce simulated human responses across several topics proficiently. Furthermore, ChatGPT has content-generating capabilities that provide varied information, accommodate multilingual input and output, cover a wide range of interests, and present clarifying responses. Unlike cumbersome search engines like Google, users can utilize ChatGPT's ability to understand various language inputs and produce more efficient and accurate responses.

Customer Service Automation

Thirdly, ChatGPT can be combined with a company's social media account to deliver prompt support to clients, address their issues, and reply to any inquiries or concerns they may have (Biswas, 2023). ChatGPT enjoys industry credibility and is well regarded by businesses because to the strong brand effectiveness and marketing strategies of its parent firm, OpenAI. When marketers utilize ChatGPT's capabilities, organizations may execute more decisive marketing strategies, connect with target customers, and attain marketing objectives. The primary function of the ChatGPT application in business is to manage search queries, consolidate information from many sources, summarize papers, develop strategies, respond to inquiries, and utilize chatbot technology

for continuous engagement with the audience. Technologies like ChatGPT can aid digital marketers in expanding their campaign reach and interacting with their target audience. The chatbot can provide alternative headlines, introductions, or complete paragraphs for promotional content based on the given topic or keyword input. Conducting audience research allows digital marketers to acquire insights about their target population. By analyzing huge data sets, ChatGPT may be trained to address common inquiries, provide customer support, and suggest products, allowing it to discern the common traits, behaviors, and preferences of specific consumer demographics.

Provide support and motivation

Students may also obtain support and inspiration through ChatGPT. ChatGPT functions as a platform for students to articulate their concerns, seek support, and acquire guidance on time and task management (Haleem et al., 2022). ChatGPT may aid students in overcoming obstacles and advancing toward their academic goals. ChatGPT aids students in attaining academic achievement and improving productivity by serving as a comprehensive source of relevant information and resources, strengthening language skills, promoting collaboration, optimizing time management, and encouraging personal growth. Although ChatGPT can aid students in multiple ways, it is crucial to underscore that it cannot replace authentic human connection. To optimize their educational experience, students must engage actively with teachers, peers, and external resources. Consequently, ChatGPT should be viewed as a supplement to human interaction and students' efforts in attaining their academic goals rather than as a replacement.

Facilitate collaboration

ChatGPT can be utilized to improve student collaboration. ChatGPT functions as a conduit for student-to-student engagement, facilitating the exchange of ideas, projects, constructive comments, and inspiration. Tlili et al. (2023) note that students benefited from employing ChatGPT to improve interactions with instructors. ChatGPT can provide unique concepts with an extensive database, which is beneficial for content ideation. As the chatbot advances and improves its functionalities in the next years, it may transform the manner in which students interact with the external environment. Educators may employ ChatGPT to focus solely on fundamental subjects while allowing students to articulate their inquiries and concerns (Haleem et al., 2023).

Uses and Gratification

This study will employ the uses and gratification theory (U & G) to develop the theoretical foundation for the research problem. The Uses and Gratifications (U & G) hypothesis examines the psychological and behavioral effects of AI technologies, such as ChatGPT, on individuals by evaluating their motives for media consumption and the satisfaction of their needs. The uses and gratification theory functions as a framework to analyze the impact of AI technology on Chinese social media and clarify user behavior on specific platforms. The U & G comprises two elements: desired gratification and achieved gratification (Rubin, 2009). The user's "gratification needs" correspond with their "media needs," whereas "gratification obtained" refers to "the actual outcome or acquired gratifications (Bae, 2018); (Hussain et al.,2020).

The investigation of the relationships and interactions of social media users is termed "social graph analysis." Sentiment analysis, which involves assessing user-generated content to determine its sentiment, is utilized to understand user behavior and to create personalized suggestions. The audience's use of evolving communication technologies and achievement of satisfaction, driven by technological improvements, mirrors conventional media. The audience selects and employs technological products based on their own needs. Nevertheless, the majority of Uses and Gratifications research portrays happiness as a fixed state resulting from pre-existing demands. Technological advancement creates new problems and cultivates specific demands for individuals aiming to satisfy their needs through media encounters. Thus, Sundar and Limperos (2013) redefined four kinds of pleasure based on modality, agency, interactivity, and navigability from their previous gratifications.

Modality-based gratification

Media content can be conveyed through various modalities, each addressing a certain facet of the human perceptual system. The term "multimedia" is occasionally used to describe the Internet because of its ability to deliver content in various formats (text, graphics, audio, video). Studies demonstrate that presenting information in various ways improves comprehension and recall. Research (Sundar, 2000) indicates that audiences require significantly more cognitive effort to understand textual material and are more easily distracted by audiovisual representations of the same subject. The increase in devices and interfaces will certainly influence users' expectations for modality affordances. Advancements in modern media technology enable viewers

to interact with representations of reality that provide heightened realism, fostering a sense of presence within the mediated environment. Realistic and immersive gratifications aligned with traditional Uses and Gratifications communication orientations are more pragmatic, but coolness and novelty are more associated with ritualized media use (Sundar & Limperos, 2013).

Agency-based gratification

The Internet allows all users to act as agents or sources of information. Historically, a restricted number of individuals have acted as gatekeepers; but, however, anyone with internet access can assume this function. Internet social media platforms facilitate the dissemination and organization of information by individuals. The emergence of user-generated content has transformed the traditional sender-receiver dynamic and fostered novel forms of engagement (Shao, 2009). Researchers have shown that the extensive availability of personalization options has made digital media users more active, with many choosing to engage as information contributors (Sundar et al., 2012). They exhibit enthusiasm for mutual assistance, as evidenced by the substantial use of online discussion forums, the rise in blog comments, and the widespread adoption of collaborative filtering programs. Research conducted by Sundar and Nass (2001) demonstrates that users favor content that is user-selected and user-preferred above that produced by professional journalists.

Interactivity-based gratification

The capacity for a user to alter media information in real time is referred to as interactivity. By fostering user engagement through the medium, interactivity essentially addresses the audience's activities throughout the consumption of content. Similarly, the expansion of interactive media may generate unprecedented satisfaction. Users may want to augment engagement and feedback from their media experience. Thus, the next generation of gratifications that consumers may seek from interactive media will include activity, responsiveness, choice, control, and flow. User involvement and activity choices regarding contemporary media interfaces have risen alongside their expectations for interactive features. Furthermore, customers anticipate that the media would react to their feedback promptly and offer a variety of controls for the user interface (Sundar & Limperos, 2013).

Navigability-based gratification

An affordance of a medium is its navigability or the user's ease of traversal within it. The Internet is better described as a space than a window, making the user's ability to navigate it essential to the communication dynamic. The pleasure of uncovering new parts or levels is amplified in games with user interfaces that provide increased navigational features compared to static options. When the navigational framework of the interface promotes continuous exploration and smooth transitions, the escapism and immersion derived from the emotional state of play are completely realized. The recurrent use of geographical metaphors by users to characterize Internet-based media signifies that navigational ease is a primary goal in interacting with these resources. The pleasure derived from browsing and playing indicates a more ritualistic interaction with the medium, while scaffolding outcomes arise from a more utilitarian approach to transactions enabled by the press (Sundar & Limperos, 2013).

Conceptual framework

The recent advancement in AI technology, exemplified as ChatGPT, is influencing prior knowledge acquisition. ChatGPT is constructed upon the robust GPT (Generative Pre-trained Transformer) technology. The model was trained on numerous textual sources to enhance its comprehension of context and linguistic subtleties. The system produces human-like conversational replies and continually improves, with each iteration exhibiting superior performance capabilities. According to U & G theory, ChatGPT exhibits the aforementioned characteristics and appeals to the specified target group. The audience's initial motivations for selection fluctuate, resulting in varying levels of satisfaction and feedback. Secondly, the audience's demand for AGI chatbots can be classified into two distinct categories: engaging in human interaction for entertainment and addressing social requirements through artificial intelligence for persons with social anxiety or real-life difficulties. The sophisticated data capabilities of AI chatbots can provide impartial creative insights for academic study or content generation. Moreover, the comprehensive database reduces the fundamental prerequisites of multiple disciplines, thereby decreasing the time and effort needed for audiences to attain knowledge in unfamiliar areas. The aforementioned satisfaction can be classified as a navigational prerequisite for knowledge acquisition, modality-driven enjoyment for escapism or leisure, the need for social integration through shared interests in nearby social contexts, and the employment of artificial intelligence by

audiences to satisfy various emotional, pleasurable, or mood-related needs to meet their affective demands. ChatGPT can improve productivity by helping students obtain essential knowledge for their homework and projects (Kasneji et al., 2023) through connections with subject matter experts. Students can utilise chatbots to enquire about a subject, and the language model will provide answers from online sources. Chatbots can recommend reading materials relevant to the student's discussion topic (AlAfnan et al., 2023; Cotton, 2023). The conceptual framework of this study is founded on the work of Cheng and Jiang from 2020.

Their research examined the effect of the AI-driven chatbot on user experience, demonstrating that perceptions of practicality, friendliness, technology, and social enjoyment greatly affected user satisfaction with the selected chatbot brand. User satisfaction favorably impacts the continued use of chatbot services, healthcare organizations, and consumer loyalty. This study primarily investigates audience satisfaction with ChatGPT in Malaysia, employing the approach developed by Cheng and Jiang (2020).

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functional attributes to psychological outcomes, the framework guides both the research design and the interpretation of results.

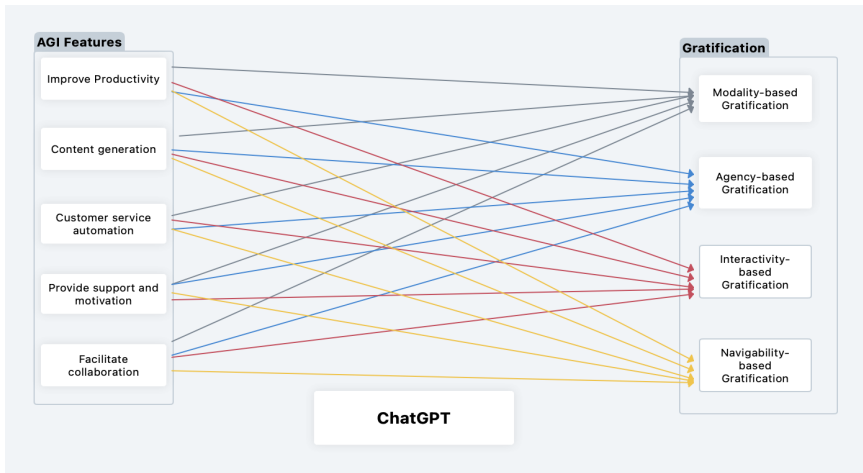


Figure 1: Conceptual framework

Hypothesis development

The ChatGPT audience desires human interaction, dialogue, and participation during recreational times. Utilize AI to address the social needs of persons experiencing social anxiety or real-world difficulties. The sophisticated data capabilities of artificial intelligence chatbots can offer impartial creative insights for academic study or literary enhancement. An efficient database diminishes disciplinary standards and enhances the learning of new knowledge for audiences. These satisfactions can be classified as navigational demands for knowledge acquisition, modality-based gratification for escapism or leisure, and social integration with immediate social circles. Audiences employ artificial intelligence to satisfy their emotional requirements, pleasures, and states of mind. ChatGPT connects students with professionals to assist in studying homework and project materials (Kasneji et al., 2023) to improve productivity. ChatGPT aids students in improving their language skills as a linguistic model. ChatGPT aids youngsters in grammar, vocabulary, and composition. Students may employ ChatGPT to improve their assignments before submission to instructors (Cotton & Shipway, 2022). Students can improve their time management abilities and avoid missing deadlines. The productivity enhancement feature of ChatGPT addresses the audience's cognitive needs for learning,

understanding, and information retrieval. The audience contends that chatbots will furnish academic knowledge to improve work productivity. Therefore, the hypothesis is delineated in the table below:

Table 1: Hypothesis

Hypothesis	The features of ChatGPT include Improving productivity, Content generation, Customer Service Automation, Providing support and motivation, and Facilitate collaboration, which is positively correlated with the four types of satisfaction (Kasneci et al., 2023)
	The five features of ChatGPT are positively correlated with modality-based gratification (Kasneci et al., 2023).
	The five features of ChatGPT are positively correlated with agency-based gratification (Kasneci et al., 2023).
	The five features of ChatGPT are positively correlated with interactivity-based gratification (Kasneci et al., 2023).
	The five features of ChatGPT are positively correlated with navigability-based gratification (Kasneci et al., 2023).

Methodology

The formulation of the problem, research questions, and objectives requires a particular research design (Saunders et al., 2009). The research design encompasses critical components of a study, including its purpose, geographical scope, methodological approach, level of researcher involvement, temporal framework, and unit of analysis (Sekaran & Bougie, 2016). This study utilized quantitative research methods to collect data from student groups in Malaysia through online surveys. Following the design of the questionnaire, it will be distributed using an online platform to engage the target audience. The participants autonomously filled out self-administered questionnaires (Sukamolson, 2007).

This study employed Chinese college students in Malaysia as subjects to collect data on nine variables. These variables included productivity enhancement, content creation, customer service automation, support and motivation provision, collaboration facilitation, modality-based

gratification, agency-based gratification, interactivity-based gratification, and navigability-based satisfaction, including ChatGPT. According to the conceptual framework, the online questionnaire will be appended. The questionnaire will be created and administered in English, focusing on Chinese students in Malaysia as the primary demographic for the survey via ChatGPT. The Chinese international students in Malaysia exhibit adequate English reading skills to complete the questionnaire, negating the necessity for translations into Chinese or Malay. Participants employ a computer or smartphone to read the questions effectively, submit responses depending on their understanding, and complete the questionnaire. Employing inquiries facilitates the acceleration of data analysis and summarization.

The questionnaire is typically divided into two sections: Part A (demographic data) and Part B (basic information), with all questionnaires employing a Likert scale. This research employed a 10-point Likert scale to capture participants' responses with greater precision and granularity. While prior studies suggest that 4- to 6-point scales are optimal for younger or less motivated respondents due to cognitive load (Smith et al., 2003), other research supports the use of higher-point scales in adult populations, especially in academic settings. For university-level participants, especially those with advanced education backgrounds, scales with more response categories have been shown to improve measurement sensitivity and reliability (Preston & Colman, 2000). A 10-point scale allows respondents to express finer distinctions in opinion and intensity of agreement, which is beneficial for identifying subtle variations in satisfaction and cognitive engagement.

This level of granularity is particularly relevant in AI-related research, where user experiences can be highly nuanced. Therefore, the use of a 10-point scale is justified for this study's target population of Chinese postgraduate students in Malaysia. In this context, the scale emulates the optimal measurement type observed in physical measuring systems, particularly the metric system, known as the ratio scale. Measurement scales in physical and psychological examinations typically progress from lower to higher levels of the construct (Nemoto & Beglar, 2014).

Data collection

This thesis research involved the distribution of 60 questionnaires, resulting in the collection of 54 completed responses. A total of 54 valid

questionnaires were collected from Chinese international students in Malaysia after sorting. Statistical analysis was conducted using SPSS 25.0 to validate the model and hypotheses examined in this study, based on the results from 54 valid surveys. The final sample consisted of 54 valid responses, which, while sufficient for exploratory analysis, is relatively small given the number of independent variables included in the regression models. With nine predictors, the statistical power may be limited, potentially affecting the stability and generalizability of the results. This constraint increases the risk of both Type I and Type II errors and may limit the robustness of conclusions drawn from the data. Therefore, caution should be exercised when interpreting these findings. Future research is encouraged to replicate this study using a larger and more diverse sample to enhance statistical validity and improve the generalizability of the results across different populations and educational contexts. Demographic information is displayed in Table 2.

Table 2. Demographics Profile of Respondents

Variable	Item	Frequency Percentage(%)	
1. Are you studying in Malaysia?	Yes	60	100.00
	Yes	54	90.00
2. Have you ever used ChatGPT?	2. Have you ever used ChatGPT?	6	10.00
	No		
3. On average, how often do you use ChatGPT per week?	0-5 times	35	58.33
	4. On average, how often do you use ChatGPT per week?	16	26.67
	6-10 times		
	4. On average, how often do you use ChatGPT per week?	9	15.00
	Above 10 times		
4. On average, how long do you use ChatGPT	5-10 minutes	49	81.67
	6. On average, how long do you	9	15.00

every time?	use ChatGPT		
	every time?		
	10-30 minutes		
6. On average, how long do you use ChatGPT every time?	Above 30 minutes		
		2	3.33
5. Gender	Male	33	55.00
	8. Gender		
	Female	27	45.00
6. Age	years years years	31	51.67
	9. Age		
	Above 33 years old	29	48.33

The survey results indicate that all participants are studying in Malaysia, with a substantial majority (90.00%) having utilized ChatGPT. Weekly usage frequency indicates that 58.33% utilize ChatGPT 0-5 times, whereas 80.00% do it. Concerning usage length, 81.67% of participants allocate 5-10 minutes to ChatGPT. The gender distribution is quite equitable, with 55.00% male and 45.00% female respondents. Age distribution reveals that 51.67% are aged 18 to 33 years, whereas 48.33% are older than 33 years. In terms of education, the majority possess a master's degree (50.00%), followed by those with a doctoral degree (30.00%). These insights offer a thorough examination of the educational environment and the utilization of AI chatbots by students in Malaysia.

Findings And Discussion

1. Reliability and Validity Analysis

The results of reliability and validity are presented in Table 3 and reliability analysis in appendix, respectively. The reliability of the dimensions of the results from this questionnaire ranges from 0.818 to 0.927, exceeding 0.7, therefore indicating that the overall data results are more consistent and believable. The item-to-total correlation (CITC) index for each topic exceeds 0.4, and the reliability following item deletion does not surpass the reliability of the related variable. Consequently, a distinct association exists between individual themes and variables, all of which can be preserved for future research.

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Table 3. Validity analysis

KMO and Bartlett's test		
KMO value		0.667
Bartlett's test of sphericity	Approximate cardinality	1922.512
	<i>df</i>	630
	<i>p</i> -value	0.000

In employing factor analysis for information enrichment research, the initial step involves analyzing the study data to ascertain its suitability for factor analysis, as seen in the above table: The KMO value is 0.667, exceeding the threshold of 0.6, so fulfilling the prerequisites for factor analysis and indicating that the data is suitable for such research. Furthermore, the data successfully met the criteria of the Bartlett sphericity test ($p < 0.05$), indicating its appropriateness for factor analysis.

Table 4. Regression test of gratification

Model	β coefficients	significance	R^2
Modality- Based Gratification	IP=0.111 CG=0.111 CSA=0.164 PSM=0.099 FC=0.191	$F(5,474)=22.986, p=0.000$	0.195
Agency-	IP=0.136	$F(5,474)=15.540, p=0.000$	0.141

Based	CG=0.145		
Gratification	CSA=0.091		
	PSM=0.091		
	FC=0.116		
Interactivity-	IP=0.055	F(5,474)=17.646,p=0.000	0.157
Based	CG=0.138		
Gratification	CSA=0.090		
	PSM=0.088		
	FC=0.219		
Navigability-	IP=0.184	F(5,474)=26.847,p=0.000	0.221
Based	CG=0.128		
Gratification	CSA=0.157		
	PSM=0.095		
	FC=0.157		

The regression model for modality-based gratification was statistically significant ($F(5,474) = 22.986, p < 0.001$), with an R^2 value of 0.195. This indicates that the five ChatGPT features can explain 19.5% of the variance in modality-based satisfaction. According the table 4, FC ($\beta = 0.191, p < 0.001$) had the strongest positive impact, suggesting that users derive high sensory and representational satisfaction when ChatGPT supports academic group work, ideation, and task coordination. The CSA ($\beta = 0.164, p < 0.001$) also significantly contributed, reflecting users' appreciation for fast, responsive systems that offer multimodal outputs, such as summaries, explanations, and interactive feedback. CG ($\beta = 0.111, p = 0.014$) and IP ($\beta = 0.111, p = 0.017$) contributed equally, indicating that creating diverse content formats and enhancing task efficiency both contribute to perceived richness and modality satisfaction. Although the effect of PSM ($\beta = 0.099, p = 0.022$) was the smallest, it was still statistically significant. This suggests that motivational feedback marginally enhances users' sensory engagement with the platform. These results show that modality-based gratification is strongest when features support dynamic participation and multi-format content exchange.

For agency-based gratification, the regression model was also statistically significant ($F(5,474) = 15.540, p < 0.001$) with an R^2 value of 0.141. CG ($\beta = 0.145, p = 0.002$) had the highest influence, confirming that the ability to create essays, summaries, and translation outputs empowers users and satisfies their desire for control over information creation. "Improve productivity" ($\beta = 0.136, p = 0.005$) followed closely, indicating that tools enabling faster academic progress foster a sense of

autonomy and mastery. FC ($\beta = 0.116$, $p = 0.017$), CSA ($\beta = 0.091$, $p = 0.047$), and PSM ($\beta = 0.091$, $p = 0.043$) were also significant, though with more modest contributions. All variables showed consistent significance. This suggests that agency is built not only through self-initiated content generation, but also through systems that provide contextual responsiveness and decision-making support. These findings align with Sundar et al. (2012) and Shao (2009). They argue that digital media users increasingly expect platforms to allow content customization and user-as-producer experiences. In the context of AI tools like ChatGPT, agency is maximized when users can both generate and manage knowledge outputs.

The regression model for interactivity-based gratification was significant ($F(5,474) = 17.646$, $p < 0.001$), with $R^2 = 0.157$, indicating that 15.7% of the variance in perceived interactivity could be attributed to the five ChatGPT features. FC ($\beta = 0.219$, $p < 0.001$) once again led as the most powerful predictor, showing that ChatGPT's value as a co-participant in dialogic tasks strongly affects how users perceive media interaction, responsiveness, and flow. CG ($\beta = 0.138$, $p = 0.003$) was also highly significant, reflecting satisfaction with real-time, adaptive content tailored to user queries. CSA ($\beta = 0.090$, $p = 0.048$) and PSM ($\beta = 0.088$, $p = 0.049$) showed modest yet meaningful influence, suggesting that systems that provide instantaneous, task-specific feedback enhance the feeling of being in conversation with the technology. Specifically, IP ($\beta = 0.055$, $p = 0.246$) was not a significant predictor in this model, implying that efficiency alone does not translate into perceived interactivity unless accompanied by mutual engagement or dialogue. This distinction emphasizes the emotional and participatory elements of interactivity, as discussed by Sundar and Limperos (2013).

The model for navigability-based gratification had the highest explanatory power among all four regressions ($F(5,474) = 26.847$, $p < 0.001$). It showed $R^2 = 0.221$, meaning that 22.1% of the variation in satisfaction with navigability is explained by ChatGPT features. IP ($\beta = 0.184$, $p < 0.001$) was the most influential factor. This indicates that users link speed and task efficiency with easy navigation through digital systems. CSA ($\beta = 0.157$, $p < 0.001$) and FC ($\beta = 0.157$, $p = 0.001$) were equally influential, suggesting that quick access to real-time support and guided interactions promote seamless user journeys across the interface. CG ($\beta = 0.128$, $p = 0.004$) and PSM ($\beta = 0.095$, $p = 0.027$) were also significant, though slightly less impactful. These findings align with Sundar and Limperos' (2013) concept of navigability as a cognitive orientation. Users feel more immersed and in control when the interface

supports exploration and provides uninterrupted access to relevant information. Among all models, navigability gratification is most strongly influenced by ChatGPT's functional features. This highlights the platform's potential to create smooth and immersive learning environments.

Conclusion

This study extends the Uses and Gratifications (U&G) framework by demonstrating how ChatGPT fulfills multiple cognitive, social, and emotional needs among Chinese international students in Malaysia. The results confirm that the dimensions proposed in previous U&G research, particularly interactivity, agency, and navigability (Sundar and Limperos, 2013; Cheng and Jiang, 2020), remain central to explaining user satisfaction in artificial intelligence (AI) environments. At the same time, the findings highlight an emerging gratification that has received limited attention in prior studies, namely, the facilitation of collaboration. This dimension reflects the evolution of user expectations from individual learning efficiency toward cooperative engagement with intelligent systems.

The strong predictive effect of the "Facilitate Collaboration" variable can be understood within the educational and cultural context of the respondents. Chinese learners traditionally value collective learning, peer support, and teacher-guided cooperation. ChatGPT's interactive design, its capacity to generate rapid feedback, and its ability to simulate academic dialogue correspond closely with these values. As a result, students perceive ChatGPT not merely as a functional tool but as a collaborative partner that enhances the co-construction of knowledge. This finding is consistent with recent research by Tlili et al. (2023) and Su et al. (2023), which emphasizes the potential of AI chatbots to strengthen social interaction and group participation in digital learning environments. From a theoretical perspective, this study broadens the explanatory power of the U&G framework by identifying a shift from individual-centered gratifications to collective and co-constructive gratifications. In traditional U&G studies, satisfaction was often derived from personal information seeking or entertainment. The present findings suggest that, in AI-mediated contexts, gratification increasingly arises from shared cognitive engagement and dialogic interaction between the user and the technology. This points to the emergence of a new form of user experience characterized by joint problem-solving, reciprocal feedback, and mutual responsiveness.

The implications of these findings for educational practice are significant. Integrating AI tools such as ChatGPT into pedagogy can promote collaborative intelligence and stimulate student participation in group learning tasks. Educators may design assignments that use AI for brainstorming, drafting, and peer review, thereby enriching communication and creativity in the classroom. However, such integration must be accompanied by ethical vigilance. Over-reliance on AI-generated support can weaken critical thinking, and the line between authentic and automated work may become increasingly blurred. To address these challenges, institutions should develop clear guidelines on responsible AI use, academic integrity, and the preservation of human judgment in learning processes.

In conclusion, this study contributes both theoretically and practically to the understanding of AI-mediated learning. It demonstrates that ChatGPT satisfies a broad spectrum of user needs while revealing collaboration as a dominant and culturally embedded source of gratification. Future research could expand on these results by incorporating larger and more diverse samples, qualitative insights, and longitudinal observations to examine how emotional trust, digital literacy, and ethical awareness influence user satisfaction over time. The findings encourage a human-centered approach to the design and implementation of AI in education, where innovation is balanced with empathy, responsibility, and the promotion of meaningful human-machine collaboration.

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Appendix

Table of reliability appendix

Variables	Name	CITC	Alpha coefficient for item deleted	Cronbach's alpha
Improve Productivity	IP1	0.845	0.849	0.895
	IP2	0.726	0.876	
	IP3	0.695	0.884	
	IP4	0.730	0.875	
	IP5	0.740	0.873	
Content Generation	CG1	0.903	0.852	0.904
	CG2	0.684	0.898	
	CG3	0.805	0.873	
	CG4	0.723	0.890	
	CG5	0.720	0.891	
Customer Service Automation	CSA1	0.890	0.835	0.902
	CSA2	0.727	0.893	
	CSA3	0.739	0.892	
	CSA4	0.807	0.864	
Provide Support and Motivation	PSM1	0.851	0.719	0.867
	PSM2	0.696	0.861	
	PSM3	0.730	0.827	
Facilitate Collaboration	FC1	0.845	0.854	0.904
	FC2	0.803	0.875	
	FC3	0.823	0.858	
Modality-Based Gratification	MBG1	0.915	0.893	0.927
	MBG2	0.783	0.916	
	MBG3	0.768	0.920	
	MBG4	0.780	0.916	
	MBG5	0.847	0.904	
Agency-Based Gratification	ABG1	0.757	0.678	0.818
	ABG2	0.630	0.796	
	ABG3	0.677	0.750	
Interactivity-Based Gratification	IBG1	0.838	0.873	0.909
	IBG2	0.801	0.879	
	IBG3	0.806	0.879	

Navigability-Based Gratification	IBG4	0.767	0.893	0.905
	NBG1	0.870	0.856	
	NBG2	0.827	0.865	
	NBG3	0.704	0.906	
	NBG4	0.797	0.875	
