Media and Communication
2025 • Volume 13 • Article 9508
https://doi.org/10.17645/mac.9508

ARTICLE

Open Access Journal

Motivations and Affordances of ChatGPT Usage for College Students' Learning

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Submitted: 28 October 2024 **Accepted:** 5 February 2025 **Published:** 3 April 2025

Issue: This article is part of the issue "AI, Media, and People: The Changing Landscape of User Experiences and Behaviors" edited by Jeong-Nam Kim (University of Oklahoma) and Jaemin Jung (Korea Advanced Institute of Science and Technology), fully open access at https://doi.org/10.17645/mac.i475

Abstract

This study explored college students' experiences and evaluations of using ChatGPT for class-related activities including essay writing, exam preparation, and homework. Students from two classes on the same subject were surveyed, and quantitative data on their motivations and usage of ChatGPT were collected (Class 1, $n = 48$; Class 2, $n = 106$; $N = 154$). Hierarchical regression analysis revealed that using ChatGPT as a study guide and for active interaction were significant predictors of actual usage level, while its usage for entertainment and study guide was associated with higher trust in the tool. We further collected qualitative data through open-ended surveys (Class 1, $n = 154$; Class 2, $n = 106$). Responses were manually coded and thematically analyzed, with comparisons drawn between the two classes. Students' perceptions varied, with many acknowledging the affordances of ChatGPT, such as helping to organize thoughts, clarifying concepts, and structuring essays. However, some participants raised concerns about the tool's limitations—particularly its potential to inhibit critical and creative thinking—as well as issues related to the reliability, accuracy, and quality of information provided. The implications of these findings are discussed in relation to the uses and gratifications theory, the technology acceptance model, and the concept of media affordances.

Keywords

affordances; ChatGPT; ChatGPT usage; generative AI; higher education; motivation

1. Introduction

Concerns have emerged regarding the role of generative AI, such as ChatGPT, with the potential to replace human labor, including educators in higher education (Jensen et al., 2024). Predictions of singularity—the idea that machines may surpass humans in cognition—raise questions about the future roles of teachers

(Bostrom, 2014). However, technological shifts in education tend to evolve incrementally. Historically, oral communication dominated knowledge transmission until the 16th century, although writing existed before the printing press (McLuhan, 1962; Ong, 1982). The Gutenberg press catalyzed a shift toward literacy, but oral traditions remained integral to learning (Eisenstein, 1979). In the 19th and 20th centuries, films and television were introduced, adding visuality as the primary mode of communication (Rheingold, 2000). Yet, classrooms continued to rely on oral and written methods, illustrating the persistence of older forms alongside newer ones.

The late 20th century introduced interactive technologies through personal computers; however, oral, and literacy-based learning remained significant (Turkle, 2015). In the 21st century, despite the proliferation of AI and virtual platforms, older forms of communication remain essential (Castells, 2000). This period, often referred to as the "age of real virtuality," highlights the interplay of various media, particularly as society seeks authentic communication during times of isolation (Turkle, 2011). Amid these digital advances, Benjamin's (1935/1968) notion of "aura" has regained relevance, underscoring the value of in-person interaction.

Generative AI refers to a category of AI that can create new content such as text, images, or music by learning patterns from existing datasets. These models leverage deep learning techniques—particularly large language models—to generate human-like outputs based on user prompts (Kar et al., 2023). Generative AI tools such as Microsoft's new Bing, Google's Gemini, and OpenAI's ChatGPT aim to integrate human-like communication through orality, literacy, and visuality (Abdul-Kader & John, 2015). These technologies show significant potential in education through adaptive feedback and personalized interaction, aligning with constructivist and social constructivist pedagogies (Piaget, 1971; Vygotsky, 1978). By automating administrative tasks, AI also supports teachers, enabling them to focus on more meaningful engagement with their students (Gamage et al., 2022). However, the rise of AI presents ethical challenges, including concerns about data privacy, algorithmic bias, and the risk of depersonalizing learning experiences (Floridi, 2021).

The thoughtful implementation of AI tools such as ChatGPT and research examining its impact on learning outcomes, user engagement, as well as its social and ethical impact on education, can enable educators to harness their potential to create more inclusive, adaptive, and engaging educational experiences while preserving the rich traditions of human interaction and communication fundamental to learning.

South Korea is an exemplary site for studying technology adoption, including AI tools such as ChatGPT, owing to its advanced digital infrastructure, proactive government strategies, and tech-savvy population. The country boasts some of the world's fastest internet speeds and extensive 5G coverage, facilitating a seamless integration of digital tools into daily life (OECD, 2023). The South Korean government has implemented comprehensive AI strategies such as the National Strategy for AI, aiming to position the nation as a global leader in AI by 2030 (Ministry of Science and ICT, 2019). Additionally, South Korea's emphasis on digital education and innovation fosters a culture that readily embraces new technologies, rendering it an ideal environment for observing and analyzing the dynamics of technology adoption and usage.

Against this background, this study explored Korean college students' experiences and evaluations of using ChatGPT for class-related activities. The research aimed to understand their motivations for its usage, actual usage levels, and how they are related to students' trust in generative AI technology. This study adopted

a mixed-method approach. Section 2 explains the theoretical background along with a review of existing literature and suggests research questions.

2. Literature Review and Theoretical Background

2.1. ChatGPT as a Learning Tool

The integration of ChatGPT—a generative AI product developed by OpenAI—into learning environments presents both advantages and challenges (Rasul et al., 2023). A comprehensive review of prior studies has revealed the following advantages: First, adaptive learning provides personalized learning experiences by tailoring feedback and resources based on student progress (Kerr, 2016). Through its interactive capabilities, ChatGPT offers adaptive learning experiences by personalizing content delivery and feedback (Rudolph et al., 2023). Individualized feedback is considered an important factor in learning as it supports students' specific needs, enhancing comprehension and performance (Nicol & Macfarlane-Dick, 2006). ChatGPT's capacity to deliver such feedback supports constructivist learning by enabling personalized guidance (Rudolph et al., 2023). This product of OpenAI also assists in literature reviews, summarizing research, and initial drafting of papers (Dwivedi et al., 2023), thus enabling students to manage information more efficiently within a small timeframe and enhancing productivity.

Furthermore, automated tools such as ChatGPT streamline tasks such as progress tracking, reminders, and academic feedback, enhancing learning efficiency and reducing administrative burdens (June et al., 2014; Zhao et al., 2022). Finally, ChatGPT facilitates innovative assessments by generating unique questions and case studies, and fostering critical thinking, creativity, collaboration, and real-time feedback, ultimately improving knowledge acquisition (Boud & Soler, 2016; Kumar, 2021).

The key challenges in using ChatGPT in higher education include issues related to academic integrity, reliability, skill assessment, learning outcomes, and misinformation. Concerns about academic integrity arise from the potential for plagiarism and contract cheating, as the ease of generating content through ChatGPT conflicts with the constructivist emphasis on active learning (Cotton et al., 2024). Reliability is another significant issue, as large language models such as ChatGPT can produce biased or inaccurate information owing to limitations in their training data, which may impede the development of critical thinking skills (Chen et al., 2023). Moreover, ChatGPT's inability to evaluate essential skills—such as leadership and problem-solving—presents a challenge, as these competencies are typically developed through experiential learning rather than automated processes (Atlas, 2023). The passive nature of AI-driven assessments further limits their effectiveness in measuring learning outcomes as they often fail to foster deep learning and meaningful engagement (Biggs, 2014). Finally, misinformation remains a critical concern, as ChatGPT can generate misleading outputs based on skewed datasets or fabricate references, exacerbating this issue (Hsu & Thompson, 2023).

2.2. Motivations for Technology Adoption in Learning

The uses and gratifications theory provides a useful framework for examining technology users' diverse motivations and satisfaction with their usage of new and emerging technologies. While Katz et al. (1973) laid the groundwork for identifying basic social and psychological needs, and with media being one of the major

sources for gratifying such needs, many subsequent scholars have discovered similar and distinct motivations for emerging media of the time, such as telephones, mobile phones, the internet, social media, and now chatbots. Some may view these technologies as eliciting new and different motivations that did not exist in previous times (or media), emerging mainly as responses to the unique characteristics of the latter media, while others may view them from the perspective of media affordances, defined as action possibilities and constraints perceived and/or actualized by media users based on their interactions with the media (Gibson, 1986; Norman, 1999).

Research on the motivations for using technology in learning has revealed key findings in the pre-AI era. Studies have shown that social influence, trust, and hedonic motivation significantly affect students' behavioral intentions to adopt technology (Holmes et al., 2021). Social influence pertains to the effects of peers, instructors, and the community on an individual's decision to use e-learning platforms. Trust involves confidence in the reliability and security of e-learning systems, which is crucial for user acceptance. Hedonic motivation refers to the enjoyment and pleasure derived from using a technology, which further drives its adoption (Holmes et al., 2021). These factors collectively contribute to a comprehensive understanding of the determinants influencing students' intentions to engage with e-learning technologies (Tarhini et al., 2017).

Investigating the motivations behind the adoption of ChatGPT in higher education is crucial for understanding its integration into academic settings. Studies have identified factors such as performance expectancy, effort expectancy, and hedonic motivation as significant predictors of educators' intentions to use ChatGPT. Additionally, research incorporating the technology acceptance model (TAM; Davis, 1989) and self-determination theory (Deci & Ryan, 1985) has highlighted the roles of trust, social influence, and personal innovativeness in shaping students' adoption of ChatGPT. Understanding these motivations can inform the development of effective integration strategies and policies in higher education.

Therefore, based on Park's (2010) integrated model of uses and gratifications theory (Katz et al., 1973) and the TAM (Davis, 1989), this study also examines whether students use ChatGPT with similar motivations as those for using other types of chatbots or media, or with differing motivations because the technology itself has new and different aspects compared to preceding ones. Park (2010) studied the adoption and usage of voice over internet protocol phone service and identified three dimensions of motivation (namely communication, instrumental, and entertainment) from his online survey data. His findings showed that motives for communication were positively associated with perceived ease of use (PEOU) and perceived usefulness (PU), entertainment motives were negatively associated with PEOU, and instrumental motives were positively associated with PU and actual usage of voice over internet protocol services. In Park's (2010) study, only instrumental motives were directly related to actual usage, whereas the other motives had indirect effects.

As the adoption of various forms of generative AI including ChatGPT is still in its early stages, it would be fruitful to examine motivations for college students' use of ChatGPT and how their motivations and PEOU and PU of ChatGPT are related to its actual usage level. Given these observations, we developed the following research questions (RQs):

> RQ1: (a) What are college students' motivations for using ChatGPT and (b) how do such motivations relate to its actual usage levels?

RQ2: How do college students' perceived (a) ease of use and (b) usefulness of ChatGPT relate to its actual usage levels?

2.3. Trust in AI

User experiences with generative AI are critical for determining how they build and sustain trust in these systems (S. K. Lee & Sun, 2023). Trust is not merely an outcome of initial interactions but develops over time through continuous use and is highly influenced by how well the AI system meets users' diverse motivations and expectations. If users encounter positive experiences, such as satisfaction with using the AI system to fulfill educational or personal goals, they are likely to view the system as reliable. This perceived trust can foster long-term engagement, encouraging users to rely on the system in various contexts beyond their initial use. By contrast, if users find their interactions with the model frustrating, or if it fails to meet their expectations, they may not only discontinue its use but also develop skepticism towards future AI innovations, affecting overall trust in AI technologies (S. K. Lee et al., 2021).

Trust in AI systems—including generative AI—plays a key role in how users integrate such technologies into their daily routines and decision-making processes. Numerous studies have demonstrated that human–machine trust is crucial in establishing effective interactions with virtual AI assistants or robots, allowing users to engage with these systems more confidently and comfortably (S. K. Lee et al., 2021; S. K. Lee & Sun, 2023). Trust in AI thus acts as a mediator between the initial motivation to use the technology and the sustained engagement necessary for educational success, problem-solving, and the use of other types of applications. When trust is established, users are more likely to expand their usage to more complex tasks, whereas a lack of trust may limit their engagement to surface-level interactions.

Moreover, in the context of higher education, where critical thinking and informed decision-making are central, trust in AI is particularly important. Students may rely on generative AI tools such as ChatGPT not only for basic information retrieval but also for developing ideas, structuring research, or enhancing creativity (Abramson, 2023; Baidoo-Anu & Ansah, 2023). A high level of trust in these systems can lead to more meaningful educational outcomes, whereas distrust may hinder the potential benefits of AI-assisted learning. Therefore, understanding how students' motivations for using ChatGPT align with their level of trust in the system is essential to improving AI integration in educational environments. Through this study, we aimed to explore the relationship between students' motivations, their actual use of ChatGPT in higher education, and how these factors collectively influence their trust in the generative AI system. Figure 1 presents the conceptual model used in this study from a quantitative perspective. With this, we propose:

RQ3: How do college students (a) motivations and (b) ChatGPT usage levels relate to their trust in the generative AI system?

2.4. Uses of AI-Chatbots in Education and Their Affordances

Kuhail et al. (2023) analyzed 36 educational chatbots by evaluating them within seven dimensions: educational field, platform, educational role, interaction style, design principles, empirical principles, and challenges/limitations. The results showed that chatbots were proposed mainly in computer science, language, general education, and a few other fields and were accessible mostly via web platforms.

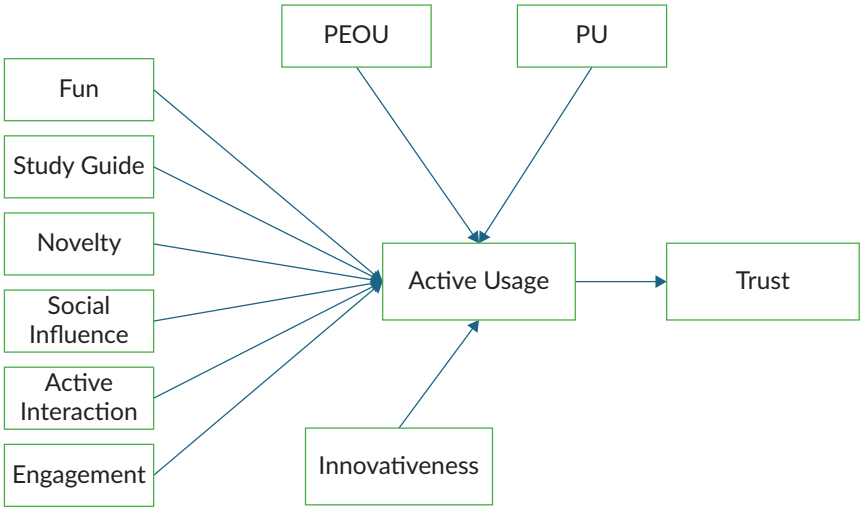

Figure 1. Conceptual model of the quantitative research.

The chatbots reflected differing educational roles, interaction styles, and design principles. J. Y. Lee and Hwang (2022) conducted a meta-analysis of 16 experimental studies that used AI chatbots for English language instruction in South Korea. Their results showed that chatbot technology had a significant effect on student learning. Lower school levels and shorter usage periods were more effective and using a purpose-built chatbot showed greater effects than using a general-purpose chatbot. The effects of linguistic competence and the affective component were particularly notable (J. Y. Lee & Hwang, 2022).

The affordances of ChatGPT in an academic context vary according to each student's individual learning skills, digital literacy, and innovativeness. During the early stages of technology adoption, the affordances of a specific medium are not well known. Thus, while inquiring about students' experiences of using ChatGPT for their classroom-related activities including writing essays, taking exams, and finding relevant information, we also explored how they perceived ChatGPT's action possibilities (what they can do with it) and constraints (challenges and/or limitations).

Huang et al. (2022) conducted a systematic review of chatbot-supported learning using a grounded theory approach to identify the pedagogical and technological affordances of AI use. The results showed three technological affordances—timeliness, personalization, and ease of use—and five pedagogical uses—for recommendations, for transmissions, as interlocutors, as simulations, and as helplines. The chatbots also encouraged students' social presence through effective and open communication. Okonkwo and Ade-Ibijola (2021) identified the integration of content, quick access, motivation and engagement, and immediate assistance as advantages of AI chatbots, while Pérez et al. (2020) found that chatbots have been successfully applied in the pedagogical domain. Overall, the use of chatbots in education has shown potential, both as administrative and teaching tools.

On the other hand, Deng and Yu (2023) examined the use of chatbot technology in learning and showed that it could not significantly improve critical thinking, learning engagement, and learning motivation. Moreover, the intervention duration did not influence chatbot-assisted learning, different from aforementioned J. Y. Lee and Hwang's (2022) findings. However, chatbot technology significantly improved explicit reasoning, learning achievement, knowledge retention, and learning interest.

Pillai et al. (2023) investigated the adoption intention and actual usage of AI-based teacher bots for learning, using a mixed-method design to explore the adoption of teacher-bots for learning. The study found direct influences on adoption intention, including PEOU, PU, personalization, interactivity, perceived trust, anthropomorphism, and perceived intelligence. Essel et al. (2022) conducted an experiment to investigate the impact of a virtual teaching assistant (chatbot) on students in Ghanaian higher education. They tracked the academic achievement of 68 university students for four months and the results showed that students who interacted with the chatbot demonstrated better academic performance than students who interacted only with their professors. Therefore, the overall results of using chatbots in education indicate that chatbots in education have promising effects.

Despite various efforts, empirical research on the evaluation or satisfaction of students when ChatGPT is applied in classes with human teachers in higher education is still lacking. Because generative AI adoption and usage is still in infancy, many users including college students are in the process of exploring this new technology to determine its utility and limitations. Therefore, we asked the following RQ:

RQ4: How do college students perceive various affordances of ChatGPT for their classroom activities?

3. Methods

The goal of the mixed-method approach was to provide a richer interpretation of the study results by explaining the relationships between variables through statistical analyses identified as relevant and significant based on existing research, while also incorporating structured questionnaire analyses that captured the lively experiences and voices of the participating students, going beyond a simple analysis of variable correlations.

3.1. Data Collection and Participants

Upon acquiring an institutional review board's approval, we first conducted a survey with five open-ended questions asking students taking a class in which a professor (one of the authors) encouraged them to try using ChatGPT for various class-related activities. The course was designed to explore the historical and thematic aspects of "media technologies and culture" by examining three modules: (a) media ontology, (b) media epistemology, and (c) media axiology. The professor provided a specific guideline for generative AI usage in the syllabus: the students must use it to develop ideas, revise, and improve final drafts of their essays, but when they do, its usage must be acknowledged. The first survey was distributed one day after the class' midterm exam (late April 2023), and participation in the survey was voluntary. More than 90% of the students ($n = 104$) participated in the survey. Table 1 summarizes the research steps.

Table 1. A summary of the research steps.

Period	Methods	Sample
April 2023	Open-ended survey with five questions (thematic analysis #1)	$n_1 = 154$
June 2023	Quantitative survey	$n_2 = 48$
June 2024	A survey including both open-ended questions (thematic analysis #2) and quantitative measures	$n_3 = 106$
August 2024	Statistical modeling of the combined quantitative data and comparative analysis of the two thematic analyses results	$n_4 = 48 + 106 = 154$

The professor explained that the purpose of the survey was to explore students' experiences and evaluations of using ChatGPT for their education and asked them to provide honest feedback. Students' names and ID numbers were collected only for assigning extra credits, and no other personally identifiable information was collected. We therefore do not have information on their age or gender distribution. The following five questions were used in the open-ended survey:

1. How useful was ChatGPT in aiding your understanding and mastery of the exam questions?
2. How did you approach using ChatGPT to assist in answering the examination?
3. Did you encounter any challenges or limitations in using ChatGPT during the examination? If so, please describe them.
4. Do you think the "Open-ChatGPT" exam enhances or detracts from your learning experiences? Please describe your experiences in detail.
5. Do you have any suggestions for the use of ChatGPT for helping with effective learning in the classroom, homework, and examinations and to ensure more responsible and ethical use of this technology?

Some students were predicted to have started using ChatGPT in November 2022, but many were introduced to the chatbot upon joining this class (i.e., Media, Culture, & Technology) in March 2023, which was two months before this survey.

Shortly before the semester ended in mid-June 2023, we conducted a closed-ended survey with quantitative measures. These measures were adopted from the previous literature on chatbot usage and interactions with an AI assistant (S. K. Lee et al., 2021; see Section 3.2 for more details). As the survey was anonymous and no extra credit was offered for the second time, participation was much lower, and only 48 students took the survey. Toward the end of the spring semester of 2024, another survey including both quantitative measures and open-ended questions was distributed in a class on the same subject with the same instructor but a different group of students ($n = 106$). The quantitative measures and open-ended questions used in the survey were the same as those used in the 2023 class.

We combined the two samples for statistical modeling (154 students). Participants' ages ranged from 19 to 30 years ($M = 21.92$, $SD = 1.85$), with 27 male (17.5%) and 115 female (74.7%) students. Twelve students did not disclose their gender. Their monthly income ranged from $0 and $9,000 ($M = \$750.21$, $SD = \$985.36$).

3.2. Measures

3.2.1. Motivations

Various types of motivations for using ChatGPT were measured with a total of 21 items covering six dimensions (Menon, 2022): entertainment, novelty, study guide, social influence, active interaction, and engagement. Each item was measured on a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*), as were the rest of the major variables in this study. An example item for the entertainment

dimension was “because it is entertaining”; for the novelty dimension was “the technology is innovative”; for the study guide dimension was “to get guidance on the study course”; for the social influence dimension was “because my friends and peers are using it”; for the active interaction dimension was “I feel active when I use it,” and for the engagement dimension was “it is very engaging.” Three additional items were used for the study guide dimension because the main context of this study was a higher education setting.

3.2.2. PU, PEOU, and Actual Usage

Two major variables of the TAM were measured with three items each (Davis, 1989) and the statements were adapted to the uses of ChatGPT (Pillai et al., 2023; Sabah, 2016). An example item for measuring PU was “I feel with ChatGPT that I learn better” and one for PEOU was “ChatGPT is easy to use.”

Three items inquiring how often participants used ChatGPT measured actual usage levels (Mohammadi, 2015; Pillai et al., 2023). An example item for measuring the level of actual usage was “I use ChatGPT every class.”

3.2.3. Trust and Innovativeness

Three items inquiring how much participants trusted ChatGPT measured the level of trust in the AI system (Roca et al., 2009). An example item of perceived trust was “I feel interaction with ChatGPT is secure enough.”

Each participant’s innovativeness was measured with four items to control for their effects on the usage and trust of ChatGPT (KISDI, 2023). Innovative individuals are more likely to adopt and use new technologies (Welch et al., 2020). An example of innovativeness was “I tend to purchase a new product with added features that are not present in my current product.”

3.3. Data Analysis

For quantitative data, after checking for normal distribution and missing data, factor analyses were conducted to check the measurement structure and reliability of the motivation scale. Five factors (entertainment, novelty, study guide, social influence, and active interaction) were extracted after excluding six items with low factor loadings. The Cronbach’s alpha value for each factor was 0.74 or higher, and the dimension of active interaction included two items for which a Spearman’s rho correlation (0.59, $p < 0.001$) was calculated. Additionally, a bivariate correlation analysis was conducted among the major variables (see Table 2 for descriptive statistics).

For the qualitative data (i.e., open-ended survey answers to five questions), one author manually coded the entire dataset and conducted a thematic analysis separately for each class’ data. After categorizing the data based on their similarities and differences, the frequency of such answers in the sample was counted. Results from each analysis (one for 2023 and another for 2024), and the main themes found and labeled from each dataset, were compared for further analysis and integrated for the presentation of this article.

Table 2. Correlations between the major variables.

Variables	*M* (*SD*)	1	2	3	4	5	6	7	8	9
1. Entertainment	3.78 (0.81)	—								
2. Novelty	3.99 (0.80)	0.73**	—							
3. Study guide	3.37 (0.90)	0.28**	0.28**	—						
4. Social influence	2.85 (1.02)	0.22**	0.32**	0.12	—					
5. Active interaction	3.09 (1.05)	0.37**	0.25**	0.28**	0.34**	—				
6. PEOU	3.86 (0.78)	0.34**	0.31**	0.33**	–0.01	0.20*	—			
7. PU	3.41 (0.93)	0.37**	0.32**	0.57**	0.18*	0.42**	0.51**	—		
8. Trust	2.81 (0.98)	0.37**	0.27**	0.32**	0.15	0.31**	0.45**	0.53**	—	
9. Actual usage	2.81 (1.13)	0.25**	0.16*	0.51**	0.16*	0.40**	0.44**	0.47**	0.42**	—
10. Innovativeness	3.08 (0.96)	0.38**	0.40**	0.26**	0.38**	0.36**	0.12	0.18*	0.22**	0.38**

Note: * $p < 0.05$; ** $p < 0.01$.

4. Results

4.1. Results of Hierarchical Regressions for RQ1–RQ3

4.1.1. Motives of ChatGPT Usage

To explore the potentially diverse motivations (RQ1a) of using ChatGPT in an educational setting, we asked the students how strongly they agreed with each of the following motives: study guide, engagement, novelty, social influence, active interaction, and entertainment. The results of the factor analysis revealed five dimensions of motives in our student sample, and the dimension of engagement did not form a meaningful factor. The descriptive statistics revealed that participants of this study showed the strongest motive in the novelty dimension ($M = 3.99$, $SD = 0.80$, Cronbach's $\alpha = 0.82$), followed by the entertainment motive ($M = 3.78$, $SD = 0.81$, Cronbach's $\alpha = 0.92$). The motive of using ChatGPT as a study guide ranked third ($M = 3.37$, $SD = 0.90$, Cronbach's $\alpha = 0.81$), and the motives of active interaction ($M = 3.09$, $SD = 1.05$, Spearman's rho = 0.59) and social influence ($M = 2.85$, $SD = 1.02$, Cronbach's $\alpha = 0.74$) were weaker than the other motives.

4.1.2. Correlations Between Motives and Actual Usage

To answer RQ1b, we performed a hierarchical linear regression with the actual usage of ChatGPT as a criterion variable, the five dimensions of motives as predictors, and the demographic variables and innovativeness as controls. Controlling for the effect of individual innovativeness ($\beta = 0.20$, $t = 2.34$, $p < 0.05$), the analysis revealed that two out of five motives were statistically significant predictors of the actual usage level of ChatGPT. The motive of study guide was a strong predictor ($\beta = 0.41$, $t = 5.29$, $p < 0.001$), and that of active interaction ($\beta = 0.24$, $t = 2.81$, $p < 0.01$) was also significantly correlated with the level of actual usage (see Table 3).

Table 3. Hierarchical regression predicting actual usage levels.

	Model I		Model II		Model III		Model IV	
	β (*t*)		*β* (*t*)		*β* (*t*)		*β* (*t*)	
Gender (Female = 0)	0.18	(1.91)	0.12	(1.34)	0.09	(1.14)	0.07	(0.95)
Income	0.04	(0.42)	0.00	(0.03)	0.00	(−0.01)	0.00	(0.03)
Age	0.01	(0.15)	−0.01	(−0.09)	0.04	(0.51)	0.05	(0.75)
Innovativeness			0.38***	(4.41)	0.21*	(2.34)	0.26**	(3.11)
Entertainment					0.03	(0.29)	−0.07	(−0.67)
Novelty					−0.08	(−0.74)	−0.11	(−1.05)
Study guide					0.41***	(5.29)	0.28**	(3.27)
Social influence					0.04	(0.46)	0.05	(0.68)
Active interaction					0.24**	(2.81)	0.20*	(2.30)
PEOU							0.23*	(2.63)
PU							0.15	(1.48)
R^2 change	0.04		0.14***		0.24***		0.07**	
R^2	0.04		0.17***		0.41***		0.48***	
Adjusted R^2	0.01		0.14***		0.36***		0.42***	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Thus, participants who had strong motivations for using ChatGPT as a study guide or wanted to actively interact with it seemed to have used it more frequently than others who did not have such motives strongly. The other three motive dimensions were not significantly correlated with the actual usage of ChatGPT and no demographic variables significantly predicted the level of usage. The motivation variables in the regression increased the amount of explained variance in the actual usage level of ChatGPT by 23.7%.

4.1.3. Correlations Between PEOU, PU, and Actual Usage

To address RQ2, in the final block of the hierarchical regression, we entered PEOU and PU as predictors of actual usage level. The results showed that PEOU, not PU, was significantly associated with the level of ChatGPT usage ($\beta = 0.23$, $t = 2.63$, $p < 0.05$). Participants' innovativeness and the two motives (i.e., study guide and active interaction) remained significant predictors of actual usage after considering PEOU and PU. Thus, all things being equal, when ChatGPT usage was perceived as easy, the participants seemed to have used it more frequently. Including PEOU as a predictor of usage level increased the amount of explained variance by 6.7%, and all predictors together explained approximately 42.4% of the variance in the actual usage level of ChatGPT.

4.1.4. Relationships Between Motives, Actual Usage, and Trust

To address RQ3, we ran another hierarchical regression with trust in ChatGPT as the criterion variable (see Table 4). Participants' (a) motivations for using ChatGPT were entered as predictors after controlling for the effects of demographics and individual innovativeness, and (b) the actual usage level of ChatGPT was considered after controlling for the effects of PEOU and PU. We found that gender ($\beta = 0.24$, $t = 2.86$,

$p < 0.01$) was a significant predictor, and two out of five motives were significantly related to the level of trust in ChatGPT. Male participants seemed to trust ChatGPT more than female participants. Entertainment ($\beta = 0.35$, $t = 2.93$, $p < 0.01$) and study guide ($\beta = 0.18$, $t = 2.10$, $p < 0.05$) motives significantly predicted the level of trust, and the amount of explained variance increased by 17.4%.

Table 4. Hierarchical regression predicting trust in ChatGPT.

	Model I		Model II		Model III		Model IV	
	β (t)		β (t)		β (t)		β (t)	
Gender (Female = 0)	0.27**	3.06	0.24**	2.86	0.24**	3.27	0.24**	3.21
Income	0.04	0.49	0.10	1.10	0.12	1.55	0.12	1.54
Age	−0.09	−1.00	−0.06	−0.71	0.00	−0.03	−0.01	−0.06
Innovativeness	0.17	1.94	−0.05	−0.56	0.02	0.28	0.01	0.14
Entertainment			0.35**	2.93	0.18	1.65	0.18	1.66
Novelty			−0.06	−0.47	−0.07	−0.66	−0.07	−0.62
Study guide			0.18*	2.10	−0.07	−0.81	−0.08	−0.90
Social influence			0.07	0.77	0.07	0.81	0.06	0.78
Active interaction			0.14	1.47	0.03	0.39	0.03	0.29
PEOU					0.17	1.88	0.16	1.71
PU					0.44***	4.27	0.44***	4.16
Actual usage							0.04	0.42
R^2 change	0.12**		0.17***		0.16***		0.00	
R^2	0.12**		0.30***		0.46***		0.46***	
Adjusted R^2	0.10**		0.24***		0.40***		0.40***	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Contrary to the predictions of the actual usage level of ChatGPT, PU, not PEOU, was significantly correlated with the level of trust in ChatGPT ($\beta = 0.44$, $t = 4.16$, $p < 0.001$). Thus, when participants perceived the usefulness of ChatGPT to be higher, they seemed to trust its safety and information security more. However, the actual usage level of ChatGPT did not significantly predict the level of trust in ChatGPT after controlling for the effects of PU. Together, all predictors explained approximately 40% of the trust level in ChatGPT.

4.2. Thematic Analysis of Open-Ended Answers About ChatGPT Usage for Student Learning

To address RQ4, thematic analyses were conducted for open-ended answers from participants on their views and experiences of using ChatGPT for their class-related activities. The results of the two thematic analyses were compared and integrated to create a final report. Table 5 summarizes the thematic analysis results with exemplary themes, codes, and direct quotes.

Table 5. A summary of the thematic analysis results with examples.

Themes		Initial Codes	Representative Quotations
Positive assessments of generative AI's usefulness	Facilitating essay writing	Providing ideas for essay writing	"I only used it when I ran out of ideas and did not have any directions to go."
		Organizing ideas	"As in most subjects, it was helpful in providing broad guidance in gathering my thoughts."
	Enhancing efficiency in learning and research	Aiding comprehension of the subject	"It can explain key terms for me in very easy words compared to the ones I searched online. I use this sentence a lot: 'Please explain xxx in easy words that primary students can understand.'"
		Functioning as a search engine	"Generative AI is useful when it comes to looking for articles about specific information."
Negative assessments of generative AI's usefulness	Concerns regarding the credibility of generative AI	Lacking depth in information	"Useful to a certain extent, it often provides very generic answers or suggestions."
		Lacking accurate information	"Sometimes it is accurate but other times it's not."
Approach to using generative AI to assist essay writing	AI as a co-writer	Asking for additional topics or ideas	"I asked what kind of topics related to my essay should I write about."
	AI as a convenient research and learning tool	Asking for general, background information	"Look up the background or more general explanation of some of the points to understand easily."
Challenges/limitations of using generative AI during essay writing	Challenges in gaining relevant and useful information	Lack of novel and/or detailed information	"Generative AI gives very vague information (for example, it doesn't give any meaningful insight and just repeats the things that I already know just in an organized way)."
	Concerns regarding accuracy and credibility	Incorrect and illogical information	"The description of a concept has not always been accurate, and sometimes the description is not logical."
Positive assessments regarding open-generative AI exam	Enhanced convenience and engagement in the learning environment	Makes studying for exams less burdensome	"The parts that are unnecessary or close to pure labor are taken care of instead, and humans can focus on the more creative and thinking aspects. It also helps with understanding and translating difficult materials."
	Academic support for mastery of exam material	Facilitates comprehension of exam material	"It enhances my learning experiences because it helped me understand concepts that were unclear during class or my readings."

Table 5. (Cont.) A summary of the thematic analysis results with examples.

Themes		Initial Codes	Representative Quotations
Negative assessments regarding the open-generative AI exam	Deterrence of independent learning	Promotes superficial learning	"Detracts because many would not study the content of the class, confident that they can pass the exam thanks to generative AI."
	Interference with students' comprehension of material	Confuses students with inadequate and inaccurate information	"Detracts from my learning experience as it provides skewed responses especially for controversial issues; it also is not very creative as it is based on previous data compiled online."
Suggestions for the use of generative AI for helping effective learning	Establishing clear guidelines and boundaries for AI use	Limit the use of AI for language and writing	"I think ChatGPT is useful to use, but rather for checking grammar or other mistakes, than for really creative tasks."
	Promote critical thinking and autonomous learning	Self-regulation on behalf of students	"Users must self-regulate their use of ChatGPT as a tool or assistant. It should be used for task-based activities, organizing, and helping to jump-start ideas rather than replicating ideas."

4.2.1. Usefulness of ChatGPT for Student Learning

In both analyses, students generally acknowledged the usefulness of ChatGPT in their learning experiences, particularly in aiding comprehension and organizing ideas. In the first analysis, approximately 68% of the students found ChatGPT useful, whereas approximately 52% in the second analysis reported its utility in helping with essay writing. Common benefits included facilitating comprehension, providing outlines, and summarizing key points, which saved students' time and effort.

One point of distinction is that the first analysis highlighted students' use of ChatGPT for diverse purposes, including as a dictionary or translation tool, whereas the second emphasized ChatGPT's ability to function as a cowriter or editor. For instance, in the second analysis, students used ChatGPT to overcome writer's block and generate thesis statements. Both analyses reflected the students' appreciation of ChatGPT's role in summarizing materials and offering alternative perspectives.

4.2.2. Limitations and Concerns

Both analyses noted concerns regarding the depth and accuracy of the ChatGPT responses. The first analysis reported that 33% of the students mentioned that ChatGPT provided only surface-level knowledge and 43% experienced difficulties in obtaining the right information because of a lack of critical insight. Similarly, the second analysis revealed that students found generative AI responses generic and often repetitive, failing to offer meaningful insights or detailed information.

A unique concern in the second analysis was skepticism over the credibility of ChatGPT's outputs, with students expressing doubts about its accuracy and potential to generate incorrect or illogical information.

Additionally, concerns regarding time-consuming processes when using ChatGPT were mentioned in both analyses.

4.2.3. Approach to Using ChatGPT

In both analyses, students used ChatGPT either during or after the exam or the essay-writing process. The first analysis reported that nearly 97% of the students interacted with ChatGPT while formulating their responses, with some rephrasing questions or copying them directly into ChatGPT for better organization. Similarly, the second analysis discussed how students used ChatGPT as a cowriter to assist with structuring essays, generating thesis statements, and offering outlines.

The second analysis expanded on ChatGPT's role as an editor, with students using it to check grammar and make their writing more professional. This element was less pronounced in the first analysis, in which the focus was on students using ChatGPT for idea generation rather than refining their own work. It is not entirely clear whether this difference between the first and second datasets originated from students' cumulative experiences of using ChatGPT in the second dataset, collected more than a year after the technology became available, or whether ChatGPT itself has advanced in its functions with multiple upgrades since its launch. In either case, it seems that students used ChatGPT more proactively to aid and improve their writing, and the role of generative AI changed from an idea generator helper to a co-editor/writer.

4.2.4. Challenges Encountered

Both analyses discussed the challenges students faced when using ChatGPT. In the first analysis, approximately 13% of the students experienced technical issues, such as network problems or limitations on the questions asked per hour. The second analysis emphasized the challenges in obtaining relevant and accurate information, especially on controversial topics and issues with incomplete responses in non-English languages.

The second analysis introduced the theme of students encountering fabricated sources or incorrect information generated by ChatGPT, leading to further distrust in the system. Both reports mentioned that the lack of novel information forced students to rely on their own notes or alternative sources for exam preparation and essay writing.

4.2.5. Impact on Learning Experience

The first analysis revealed that 63.5% of the students believed that the open-ChatGPT exams enhanced their learning experiences by encouraging deeper engagement with the material. Students noted that ChatGPT helped them question the course content and provided structured insights for their essays. Similarly, the second analysis noted how students felt that ChatGPT made the learning process more efficient and accessible by simplifying complex concepts and acting as a "private tutor."

However, both reports highlighted concerns regarding the detraction of ChatGPT from learning. In the first analysis, some students felt that relying on ChatGPT disengaged them from the course material, leading to a lack of critical thinking and perceived cheating. This aligns with the findings of the second analysis, where students argued that ChatGPT prompted superficial learning and led to an over-reliance on AI.

4.2.6. Recommendations for Ethical Use

Both analyses emphasized the importance of the responsible and ethical use of ChatGPT. In the first analysis, students called for individual responsibility in critically assessing the ChatGPT output and cautioned against over-dependence on AI. The second analysis reinforced this finding by suggesting the need for clearer guidelines and AI literacy to promote critical thinking and ethical engagement. It also advocates fostering classroom discussions on the use of AI and encouraging self-regulation.

Both analyses provided a balanced view of the benefits and limitations of ChatGPT in aiding student learning. While ChatGPT proved to be a valuable tool for organizing ideas, summarizing information, and providing insights, concerns about its depth, accuracy, and potential to foster an overreliance on AI remained consistent across both reports. For ChatGPT to be effectively integrated into learning environments, clear guidelines, critical evaluation, and ethical use must be promoted, with a focus on supplementing, not replacing, student-driven inquiry and critical thinking.

5. Discussion

This study aimed to elucidate how students adopt new generative AI technology in college classrooms. While technology has advanced rapidly, human adaptation to it lags, imposing limitations on the swift and profound transformation of the classroom. Due to this delayed adaptation, social changes occur gradually and stabilize, presenting a paradox. Therefore, there is no need for excessive and hypersensitive reactions to the development of new technologies. The internalization and utilization of these technologies remain within the purview of humanity. We should calmly contemplate how to employ them in our livelihoods, industries, education, and everyday lives, and approach them astutely.

Furthermore, this study sheds light on the efficient use of generative AI in thematic essay writing for future higher education. The upcoming generation may not necessarily require proficiency solely in technology but rather an acute understanding of universal human orality, literacy, visuality, and interactivity (Abdul-Kader & John, 2015; Ong, 1982). The timeless principles of human culture, which have endured for thousands of years, provide the most essential and efficient blueprint for preparing for an unpredictable future in education. Thus, schools and universities across all levels in this era of “real virtuality” (Castells, 2000) must devise and implement a pedagogy that actively engages with the universal principles of human culture for the next generation. To contribute to this mission of higher education, this study, by utilizing both quantitative and qualitative methods, examined how college students used ChatGPT and perceived its affordances.

5.1. Key Motivations for ChatGPT Adoption in Education

This study identified five primary motivational dimensions for using ChatGPT in education: novelty, entertainment, study guidance, active interaction, and social influence. The quantitative findings revealed that novelty and entertainment were the strongest motives, suggesting that students viewed ChatGPT more as an exploratory or recreational tool than as a means for sustained engagement. This contrasts with earlier studies such as Kuhail et al. (2023) and Huang et al. (2022), which emphasized motivation and engagement as key affordances of chatbots. The lack of structured interactions and long-term integration into

educational practices may explain this discrepancy. The qualitative findings further highlighted students' mixed perceptions of ChatGPT's utility, with many describing it as providing surface-level knowledge and generic responses. For example, many students noted a lack of depth in their responses and reported challenges in obtaining critical insights. These findings suggest that, while novelty and entertainment may drive adoption, limitations in ChatGPT's ability to provide meaningful, detailed information temper its perceived value as a learning tool.

5.2. Predictors of ChatGPT Usage

The regression analysis showed that using ChatGPT as a study guide and for active interaction significantly predicted actual usage levels. This aligns with Pérez's et al.'s (2020) findings that highlighted the pedagogical value of chatbots as study aids. The qualitative data supported these insights, revealing that students frequently used ChatGPT to generate ideas, organize thoughts, and offer outlines. In the analyses of two datasets, students reported using ChatGPT as a cowriter or editor, particularly for checking grammar and professionalizing their writing. The qualitative data also revealed a shift in usage patterns over time, with students increasingly employing ChatGPT as a coeditor rather than solely as an idea generator. This evolution may reflect either students' growing familiarity with the tool or advancements in ChatGPT's capabilities through successive updates.

5.3. Trust and Its Drivers

Entertainment and study-guide motivations were positively linked to trust in ChatGPT, with male participants showing higher trust levels. Although PU emerged as a significant predictor of trust, PEOU did not, contrasting with its influence on usage level. The qualitative findings offered additional context, highlighting skepticism about the accuracy of ChatGPT. Notably, 43% of the students reported doubts about its credibility, citing concerns over fabricated sources and incorrect information. These issues were particularly pronounced when students sought information on complex and controversial topics. Despite these challenges, many students appreciated ChatGPT's role in simplifying complex concepts and enhancing accessibility, likening it to a "private tutor." This duality—trust in its utility but caution about its reliability—underscores the nuanced relationship between student perceptions and ChatGPT's evolving role in education.

5.4. Challenges and Impacts on Learning

The findings highlighted several challenges in using ChatGPT, including technical issues, time-consuming processes, and concerns regarding superficial learning. Qualitative findings showed that some students experienced technical limitations, such as network problems or usage restrictions, while others reported difficulties obtaining relevant and accurate information. Additionally, the lack of novel insights often forced students to rely on alternative sources, diminishing the perceived value of ChatGPT in academic contexts.

Despite these challenges, ChatGPT was seen as enhancing the learning experience for majority of the students in the first analysis, with many noting its ability to encourage deeper engagement with course content. However, both analyses also revealed concerns about overreliance on AI, which some students felt detracted from critical thinking and meaningful engagement. This aligns with the quantitative finding that

PU did not significantly predict usage, suggesting that ChatGPT's practical utility may be overshadowed by its limitations and students' cautious approach toward integrating it into their learning routines.

5.5. Theoretical Implications

The findings of this study have theoretical implications for various communication and media theories, including uses and gratifications (Katz et al., 1973), the TAM (Davis, 1989), and media affordances (Gibson, 1986; Norman, 1999). First, this study drew on Park's (2010) integrative model of uses and gratifications and the TAM to examine students' varied motivations for using ChatGPT and their perceptions of its usefulness (PU) and ease of use (PEOU). While Park's study considered three motives (entertainment, communication, and instrumental) and how they connected to PU, PEOU, and voice over internet protocol usage, this study found that three motives (entertainment, novelty, and study guide) affected ChatGPT usage in a higher education context, even after controlling for PU and PEOU. In Park's (2010) study, PEOU was not directly related to actual usage but was linked to entertainment and communication motives, with PU mediating the impact of PEOU on usage. By contrast, our study showed that PEOU, not PU, influenced actual usage, while the study guide and active interaction motives remained significant even after controlling for the effect of PEOU. These differences may reflect the distinct technological contexts between the two studies. Generative AI tools such as ChatGPT may benefit more from PEOU because of their novel and assistive roles in academic tasks. Nevertheless, the uses and gratifications theory and the TAM retain their theoretical relevance by demonstrating flexible applicability across different technological settings.

Second, this study highlights how ChatGPT's affordances, such as providing quick responses and assisting with concept clarification, shape students' learning experiences. Media affordance theory suggests that technologies offer specific capabilities that influence their use (Gibson, 1986; Norman, 1999). In this case, ChatGPT's affordances make it a useful tool for tasks such as organizing thoughts and accessing information efficiently. However, the study also highlights the constraints of ChatGPT, particularly its potential to limit creativity and critical thinking, which aligns with the findings of Deng and Yu (2023) but contrasts with Abramson's (2023) view that AI can enhance creativity by offloading routine tasks. Media affordance theory posits that, while technologies offer affordances, they also impose constraints. In ChatGPT's case, its ability to provide quick answers may inhibit deeper exploration and creative problem-solving if students rely too heavily on it.

5.6. Practical Implications

The findings of this study can inform the integration of generative AI tools into college curricula and support student learning. Our research suggests that college students are more likely to use ChatGPT as a "study guide" when instructed and guided by their professors. Rather than leaving students to determine how to use the tool ethically and responsibly, encouraging its use for class-related activities—such as writing essays, searching for information, and taking exams—can foster greater awareness and reflection on ChatGPT's benefits and limitations.

These insights are also valuable for industry stakeholders and developers of generative AI tools. The challenges highlighted by students, such as difficulties in locating accurate information when using non-English languages (e.g., Korean in this study), underscore the need to improve the tool's ability to identify and provide reliable

information, along with credible sources. Without addressing these issues, discussions on the ease of use or utility of generative AI tools in higher education risk becoming irrelevant.

5.7. Limitations and Future Directions

This study has several limitations that should be addressed in future research. First, the sample size for the statistical modeling was relatively small, as data collection was limited to two classes of college students enrolled in the same subject. As this was a field experiment, we aimed to ensure that all students were exposed to the same instructor's guidance on using ChatGPT for their class-related activities. A larger sample size would have allowed for more statistical power and advanced analyses, such as structural equation modeling, which could test both direct and indirect relationships among variables simultaneously. Therefore, future research should consider collecting data from multiple classes or from a larger single class.

Second, because our study examined ChatGPT usage and perceived affordances among Korean college students, the findings have limited generalizability. One potential reason why the "study guide" motive emerged as a significant predictor of usage level could be the unique context of our research, situated in higher education. Because students were encouraged by the professor, an authority figure, to use ChatGPT for all kinds of class activities, they might have believed that it could be used as a study guide and been artificially motivated. Although other motives—such as active interaction with ChatGPT or entertainment—were also related to the usage of or trust in the AI system, the findings may differ in other settings, such as workplaces. If full-time professionals were participants in the study, their motives for using ChatGPT as a work tool might have been highlighted. Therefore, we cannot claim that our findings can be readily generalizable to other contexts or populations of ChatGPT users.

Third, we cannot claim causal relationships among the variables examined in this study. Based on the uses and gratifications theory and TAM, we assumed causality from motives to usage, and from PU and PEOU to usage. However, it is possible that the participants' prior usage levels influenced their motives or perceptions of ChatGPT's usefulness and ease of use. Similarly, while our research model posited a causal influence of motives and usage on trust, the participants' existing trust in the AI system could also affect their motives and usage levels. Therefore, until we collect and analyze longitudinal data, these causal relationships remain speculative.

Finally, we suggest that future research include more measurement items to capture various types of motives for using ChatGPT. This study primarily used three items per dimension, except for the "study guide" dimension, which may have affected the factor analysis results, leading to the exclusion of the "engagement" dimension. To reduce measurement errors, future studies should include additional items per dimension, and prepare for the possibility of low factor loadings or omission of important dimensions.

Acknowledgments

The author(s) acknowledge the use of ChatGPT 4.0 to improve the language and readability of this article. After using this tool/service, the authors reviewed and edited the content as required and take full responsibility for the content.

Funding

Data collection was supported by BK21 funds from the School of Media and Communication at Korea University.

Conflict of Interests

The authors declare no conflict of interests.

Data Availability

Data from this study will become available upon reasonable request to the first author.

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