A Study on the Intention of South Korean University Students for Educational Utilization of ChatGPT

Hanho Jeong[*]
Chongshin University
Korea

The primary aim of this study was to examine how various factors influence university students' intention to use ChatGPT for educational purposes and to analyze the structural relationships between these factors. Specifically, the study investigated Social Mood and Self-Efficacy as exogenous variables, while considering Confirmation, Task Technology Fit, and Satisfaction as mediating variables, and Intention to Use as the dependent variable. Data were collected from 261 students at two universities in the Seoul metropolitan area of South Korea, and structural equation modeling was employed to analyze the impact of each variable on the Intention to Use and the interrelationships among the variables. The study found that ChatGPT partially meets the educational expectations of Korean university students. It was observed that Confirmation, which is influenced by Social Mood and Self-Efficacy, significantly affects the intention to use ChatGPT. Additionally, Satisfaction has a direct and significant influence on students' intention to use ChatGPT, indicating that the level of satisfaction with ChatGPT plays a crucial role in their continued usage. Moreover, Social Mood and Self-Efficacy were found to indirectly influence the intention to use ChatGPT through mediators such as Confirmation, Task Technology Fit, and Satisfaction. These findings highlight the complex interplay between these variables and their impact on students' usage of ChatGPT, providing valuable insights into the factors that drive its educational use.

Keywords : ChatGPT, South Korea, University student, Intention to Use

* Corresponding author: Department of Education, Chongshin University, Hjeong@csu.ac.kr

Introduction

The rapid advancement of digital technologies is causing significant changes in education, altering the landscape of learning activities. Particularly, the progress in Artificial Intelligence (AI) is accelerating these changes by facilitating the creation of new knowledge, problem-solving, and collaboration among learners (Cho et al., 2023). Recently, attention has been focused on the widespread adoption and application of ChatGPT, an AI-powered text generation tool developed by OpenAI and released in November 2022. There is growing anticipation that the integration of ChatGPT will lead to substantial changes in conventional learning activities. Specifically, the educational utilization of ChatGPT is expected to surpass mere assistance or support for learners (Lodge et al., 2023), fostering collaborative outcomes through learner interactions.

For example, due to the distinctive features that ChatGPT possesses compared to traditional technologies, it is anticipated that the educational utilization of ChatGPT could stimulate systematic changes in learners' learning activities (Lodge et al., 2023). Second, the educational application of ChatGPT is expected to not only regulate the human learning process but also enhance cognitive abilities, unlike traditional technologies (Lodge et al., 2023). Third, the educational use of ChatGPT is expected to surpass its traditional role of simply delivering existing learning information or knowledge, instead involving learners in knowledge generation and actively guiding the learning process alongside them (Järvelä et al., 2023).

As of 2023, several universities in South Korea have been observed engaging in various educational activities utilizing ChatGPT. For instance, in South Korean universities, ChatGPT is employed across diverse fields such as language education, medical education, and liberal arts education. Research conducted at South Korean universities indicates that in the field of language education, ChatGPT is utilized for writing (Oh et al., 2023), language learning (Koo & Hong, 2023), Korean language learning (Y. Lee, 2023), and English language learning (Keon & Lee, 2023).

Furthermore, in the field of medical education, ChatGPT is actively used for clinical medical education (Hong et al., 2023) and nursing education and program development (Kim et al., 2023), while in liberal arts education, it is applied in entrepreneurship education (I. Kim, 2023), coding education (W. Kim, 2023), and exploration and application of AI paradigms (N. Park, 2023; Shon, 2023).

However, in addition to optimistic prospects regarding the utilization of ChatGPT in Korean universities, concerns and worries have arisen regarding potential issues and challenges from the learners' perspective. Firstly, from a positive viewpoint, learners can benefit from ChatGPT by gathering materials or information helpful for their learning activities (Lee et al., 2023; Yoon, 2023), as well as engaging in university-level writing activities, problem-solving, and assignments (Shin et al., 2023; Son, 2023). Additionally, learners can also receive assistance with higher-level exploration and learning activities suitable for university education (Shin et al., 2023; Yoon, 2023). However, despite these positive aspects, several issues and concerns have also emerged regarding the utilization of ChatGPT among Korean university students.

There may be concerns regarding the reliability of information, data, and knowledge acquired by learners through the use of ChatGPT (Shon, 2023). Moreover, significant potential exists for issues related to the exposure of personal information due to the use of ChatGPT (Jung & Park, 2023), as well as ethical concerns such as improper citation and plagiarism without proper attribution (Jeon, 2023; Kim & Oh, 2023). However, despite these concerns and issues associated with the use of ChatGPT, numerous research studies related to ChatGPT and learning among Korean university students have been published, indicating active utilization of ChatGPT in Korean universities. Of course, the hopeful prospects and concerns regarding the educational utilization of ChatGPT are not limited to Korean universities but represent a universal phenomenon observed worldwide. Consequently, discussions about effective ways of using ChatGPT and discussions about imposing restrictions or prohibitions on educational utilization are underway

in some countries (Lim et al., 2023). Thus, hopeful prospects and concerns regarding the educational utilization of ChatGPT coexist from the learners' perspective.

Considering the reality of South Korean universities, it is possible to anticipate the potential utilization of ChatGPT in various academic fields in the future. However, alongside this potential, it is anticipated that issues concerning learners' use of ChatGPT will persist and be addressed. Given this reality, understanding learners' intentions regarding the educational use of ChatGPT is crucial. Furthermore, with the expected rise in the educational utilization of ChatGPT in the future, research investigating user intentions becomes imperative. Specifically, comprehending learners' intentions is vital for assessing the sustainability of ChatGPT's educational use and identifying influential variables. Therefore, future research should focus on enhanced exploration of learners' intentions regarding the educational use of ChatGPT. This research holds significance, particularly in light of the rapidly expanding field and significance of ChatGPT's educational use in Korean universities (Han, 2023; Jang & So, 2023).

Therefore, this study established a foundational framework based on prior research exploring learners' intentions regarding the educational use of ChatGPT and considering factors that may influence these intentions. Drawing on previous studies (Le, 2023; Liu et al., 2022; Mikalef et al., 2016; Park & Kim, 2023; Wu & Chen, 2017) examining intention to use generative AI, both a proposed model and alternative models were formulated in this study. These models were employed to investigate the relationships among variables influencing learners' intention to utilize ChatGPT for educational purposes.

Research questions

1. What are the variables influencing learners' intention to use ChatGPT for educational purposes?
2. What are the relationships among variables influencing learners' intention to use ChatGPT for educational purposes?

Literature Review

Current Trends in the Educational Use of ChatGPT

The introduction of digital technologies in education is fostering innovation in learning experiences, with advancements in AI technology accelerating these changes. Among these technologies, OpenAI's ChatGPT has demonstrated remarkable achievements in language modeling, generating interest in its potential applications in educational settings. Consequently, South Korean universities are actively exploring and integrating artificial intelligence, particularly ChatGPT, based on previous research findings. Here, we aim to examine the educational use of ChatGPT in Korean universities, drawing on relevant previous studies. As of 2023, the utilization of ChatGPT in South Korean university education can be broadly categorized into "immediately applicable academic fields" and "potential future applications." Our examination of the educational use of ChatGPT in South Korean universities from these two perspectives reveals the following.

Intention to Use ChatGPT

Potential fields for utilizing ChatGPT in South Korean universities can be identified from the perspectives of both instructors and learners. Initially, from the instructor's perspective, efforts have been made to understand how ChatGPT is utilized by instructors and to explore ways to enhance its potential. For instance, research by Cha & Im (2023), Han (2023), and Jang & So (2023) has focused on trends in ChatGPT usage in university education from the instructor's perspective, its potential, and integrated utilization. Additionally, from the learner's perspective, exploration has been conducted on both positive and negative aspects, as well as user perceptions. For example, S. Kim (2023), J. Park (2023), and Yoon (2023) have sought ways to provide positive learning experiences by focusing on harmonious utilization methods, innovation, and usage guidelines. On the other hand, Choi &

Roh (2023) and Oh & Kim (2023) have addressed negative aspects such as assignment plagiarism and limitations. Furthermore, active research has explored learners' perceptions of ChatGPT, which is gradually expanding its usage in South Korean higher education. Studies such as intention to use during assignments (Kim & Oh, 2023), learners' acceptance (Jeong, 2023), perception of usefulness (Choi & Roh, 2023), usage perception and experience (M. Lee, 2023), and continuous intention to use (C. Lee, 2023) have been conducted. Through these studies, a deeper understanding of the effects and limitations of learning through ChatGPT has been sought, and various user experiences have been analyzed to explore improvement strategies and suggest future directions for usage. Such research from both the instructor and learner perspectives is expected to provide important guidelines and recommendations for the educational utilization of ChatGPT in the future.

Areas of ChatGPT Utilization

ChatGPT has emerged as an immediately applicable tool in academic fields such as language education, medical education, and liberal arts education. In terms of language education, ChatGPT has been utilized in various areas including writing practice (Koo & Hong, 2023), composition (Y. Lee, 2023; Oh et al., 2023), examples of self-introduction letter writing (J. Lee, 2023), and the process of Korean writing (Y. Lee, 2023). Additionally, in the field of English education, its application has been observed in reading comprehension exercises (Keon & Lee, 2023), content-based teaching tools (Shin, Jung, & Lee, 2023), and self-regulated learning (Lee & Park, 2023). In medical education, various explorations related to the use of ChatGPT have been conducted. In the medical field, Hong et al. (2023) investigated the effectiveness of ChatGPT in clinical medical education, while in the nursing field, Kim et al. (2023) presented approaches for utilizing ChatGPT in basic nursing education and nursing education program development. In the realm of liberal arts education, along with the strengthening of conventional education, exploration and application of the AI paradigm have been underway. I. Kim (2023) and W. Kim (2023) are utilizing

ChatGPT to enhance existing education in areas such as entrepreneurship education and coding education, while N. Park (2023) and Shon (2023) have examined approaches to exploring and applying the AI paradigm in liberal arts education. Through the aforementioned content, it can be anticipated that ChatGPT will be extensively utilized across various fields in Korean universities in the future.

Through the exploration of ChatGPT's educational utilization in South Korean universities, various potential applications across diverse academic fields can be anticipated. Furthermore, insights into current trends and future possibilities regarding ChatGPT's integration into South Korean university settings were obtained. Particularly, insights into how ChatGPT can be more effectively utilized in South Korean higher education were gained. However, the integration of ChatGPT into South Korean university education is still in its early stages, and there is a demand for more systematic and practical exploration to enhance its utilization. Especially considering the anticipated rapid increase in ChatGPT's educational utilization in university settings, understanding learners' intentions to use it is crucial. A comprehensive understanding of learners' intentions to use ChatGPT is essential for maximizing its educational effectiveness and enhancing user experiences. Therefore, future research should focus on strengthening the investigation of learners' perceptions and intentions to use, thereby contributing to improving the educational effectiveness of ChatGPT and enhancing user experiences. Drawing upon existing literature, this study explores the factors influencing learners' intentions to use ChatGPT in university education and examines their impacts. With the increasing utilization of ChatGPT in universities, the current study specifically targets the identification of factors and their effects on learners' intentions to use.

Exploration of Factors Affecting Intention to Utilize ChatGPT

Exogenous variable: Social Mood (SM), Self-Efficacy (SE)

Social Mood (SM). Social Mood (SM) is shaped through interactions among

members of a community, reflecting organizational culture, norms, attitudes, and perceptions (Moran & Volkwein, 1992; Yukl, 2006). In the context of technology adoption, it refers to individuals' perceptions of the prevailing social atmosphere regarding the utilization of a specific technology (Zhang, 2009). A positive social atmosphere surrounding a particular technology directly influences individuals' preferences for it (Grewal et al., 1998) and provides a sense of personal security regarding its use (Zacharia et al., 2000). For instance, when an individual starts using a particular technology and receives recognition and acceptance from fellow community members, they may feel reassured and are likely to continue with their usage (Sun et al., 2008). In this context, social mood refers to an individual's perception or emotion regarding the community or peer acceptance related to technology utilization (Mikalef et al., 2016).

In such contexts, the community's attitudes towards newly introduced technologies like ChatGPT play a significant role in shaping individual choices and usage. With the rising adoption of new technology, users' decision-making is increasingly influenced by online-formed Social Mood, including electronic word-of-mouth (eWOM) (Wang et al., 2018). Moreover, the expanding digital environment has heightened the impact of Social Mood on technology adoption and acceptance (Zhang et al., 2023). Additionally, the pervasive use of social media has a substantial influence on the adoption and usage of new technologies like ChatGPT, often surpassing personal intentions (Cioc et al., 2023; Vorderer et al., 2018). Particularly in South Korea, where digital technology is highly developed and online communities are active, users tend to rely on evaluations and the social atmosphere of their online communities when choosing and utilizing new technologies (M. Park, 2023).

In this regard, social mood surrounding new technologies is a critical factor influencing adoption and usage, shaped by the community's atmosphere. Describing the significance of social mood in relation to the utilization of ChatGPT, it can be defined as the "degree to which an individual perceives or acknowledges the perceptions, preferences, understanding, and likings of the university community or surrounding peers, seniors, or juniors regarding the educational use of ChatGPT,

newly introduced and adopted in the university.

Self-Efficacy (SE). Self-efficacy (SE), initially proposed in social cognitive theory by Bandura (1977), refers to an individual's confidence in their capability to execute actions leading to desired outcomes in a given task situation. Additionally, it encompasses the subjective perception of one's ability to effectively navigate uncertain situations encountered while pursuing specific goals (Bandura, 1977). When examining the significance of self-efficacy concerning the adoption of new technology, it indicates an individual's belief in their capacity to utilize the technology independently, without external assistance (Compeau & Higgins, 1995).

For instance, concerning computer or internet usage, self-efficacy pertains to one's belief in their capability to effectively utilize these technologies (Sun et al., 2008). Previous studies have indicated that prior experience with technology influences the development of self-efficacy (Agarwal, 2000; Igbaria & Iivari, 1995; Webster & Martocchio, 1995), which significantly impacts users' intentions to use information systems (Compeau & Higgins, 1995; Hillet al., 1987). Moreover, self-efficacy has been found to positively influence satisfaction (Sun et al., 2008) and academic achievement (Wang & Newlin, 2002) associated with the adoption of new technology. Therefore, self-efficacy regarding the adoption of new technology plays a pivotal role in shaping individuals' beliefs about their capability to utilize the technology effectively, thereby influencing their cognitive processes, motivations, and behaviors. In this study, self-efficacy related to ChatGPT is defined as the subjective belief in one's ability to effectively use ChatGPT for academic purposes without prior experience or external assistance, solely relying on basic guidance.

The current study examined the influence of exogenous variables such as social mood and Self-Efficacy (SE) on university students' intention to use ChatGPT, mediated by Confirmation (CFM), Task Technology Fit (TTF), and Satisfaction (STF).

Mediating variables: Confirmation (CFM), Task Technology Fit (TTF), Satisfaction (STF)

Confirmation (CFM).   Confirmation (CFM) refers to the extent to which users' expectations and their actual experiences following the utilization after using a particular technology (Oliver, 1980). In the context of adopting new technology, confirmation involves users' perception of whether the technology helps them achieve their intended goals, influencing their decision to accept its use (Al-Mamary et al., 2023; Chandradasa & Galhena, 2022). Generally, user expectations involve the desire to achieve specific outcomes through the use of technology (Seok et al., 2017).

For instance, users anticipate incurring both tangible and intangible costs and benefits from utilizing a specific technology (Esmaeili et al., 2013). Within this context, users assess the balance between the costs and benefits, which influences their expectations regarding the technology's utility (Kim et al., 2015). Confirmation encompasses users' perceptions before and after using a particular technology, reflecting the degree of alignment between their prior expectations and post-usage experiences, information, services, and demands (Bhattacherjee, 2001). Typically, users hold certain expectations before adopting a specific technology (Olson & Dover, 1979). Based on the extent to which these expectations are met through actual usage, users evaluate their intention to continue using the technology (Cho, 2004). If users achieve their desired outcomes through the utilization of a specific technology, they are more likely to continue using it. Confirmation related to technology usage provides users with confidence that the technology will help them achieve their goals or fulfill their desires (Khan, 2001).

Applied to ChatGPT, confirmation involves the alignment between users' pre-existing expectations and their post-usage experiences regarding the educational utilization of ChatGPT. It encompasses users' expectations before using ChatGPT and their subsequent personal experiences, the accuracy and precision of the provided knowledge or information, and the alignment with the academic outcomes derived from it.

Task Technology Fit (TTF). Task Technology Fit (TTF) is a critical component of the Task-Technology Fit Model, which assesses the alignment between technology and task performance, resolution, and outcomes (Goodhue & Thompson, 1995). It measures how well a specific technology supports the information and resources needed for task completion and resolution. The Task-Technology Fit Model is a framework originally designed to evaluate the compatibility between task characteristics and the technology applied when introducing new technology to enhance or innovate existing tasks (DeLone & McLean, 2003; Goodhue & Thompson, 1995). This model guides the direction and prioritization of appropriate technology adoption and predicts how the introduction of new technology will impact user behavioral intentions and behavior change.

In this context, task technology fit is a fundamental variable of the Task-Technology Fit Model, closely linked with the utility, usefulness, and capability of technology. It indicates how well the use of a specific technology aligns with knowledge acquisition, information retrieval, activities, task performance, and problem-solving (Lin & Huang, 2008). Task technology fit reflects users' perceptions of the ideal functionality and resources required for the tasks or problems they encounter through the use of specific technology and influences the tasks and problem-solving activities users intend to undertake. When considering the adoption of new technology, task technology fit emphasizes the expected problem-solving capabilities through the use of technology rather than focusing solely on the technology itself. It helps evaluate users' intentions to use the technology effectively.

Moreover, task technology fit influences user satisfaction with how effectively cutting-edge technology meets their tasks and needs, and task technology fit and satisfaction are interconnected variables that contribute to technology acceptance (Dahri et al., 2023). In this study, the significance of task technology fit related to ChatGPT is defined as the appropriateness level of users' learning activities through ChatGPT, including acquiring university-level knowledge, understanding course content, task performance, and problem-solving related to learning.

Satisfaction (STF). Satisfaction (STF) refers to the emotional and affective response expressed by users based on their perceptions of the outcomes or results derived from using a specific service or product, both before and after actually using or experiencing it (Oliver & DeSarbo, 1988). Satisfaction encompasses the evaluation of the gap between users' expectations formed before using a particular service or product and their perceptions of the outcomes or results after using it (Tse & Wilton, 1998). Therefore, satisfaction encompasses multidimensional meanings, including users' emotional responses and direct evaluations of experiences with goods or services (Bendall-Lyon & Powers, 2004).

Particularly, satisfaction represents users' cognitive and affective judgments regarding the experiential process or outcomes of specific goods or services (Tse & Wilton, 1998), encompassing a complex concept that includes users' willingness to incur additional costs, fairness, performance, and achievements. As such, satisfaction involves an overall judgment process regarding the perceived discrepancy between users' expectations formed before using a specific product and their experiences after actual utilization (Han & Ryu, 2009). When the provision of a specific service or goods meets or exceeds users' pre-usage expectations, satisfaction naturally emerges from users (Shamsudin et al., 2020). This notion of satisfaction is a core concept in manufacturing or industry, crucial for increasing user loyalty to specific products or services (Riva et al., 2019). Consequently, user satisfaction with a particular product or service can be seen as a crucial factor directly influencing further intention to use (Seo, 2021). Conversely, users who are dissatisfied with a particular product or service and instead harbor dissatisfaction may alienate even potential users from that product or service (Andaleeb & Conway, 2006). Previous studies on the educational use of technology have confirmed satisfaction as a key determinant influencing the intention to use technology (Ayyoub et al., 2023; Dhiman & Jamwal, 2022; Roca & Gagne, 2008). Therefore, in this study, the significance of satisfaction related to ChatGPT is presented as the degree of satisfaction with knowledge and information acquisition, participation in learning activities, task performance and problem-solving, and

academic achievements through the educational use of ChatGPT.

Based on this, the present study explored how Task Technology Fit (TTF) and Satisfaction (STF) with ChatGPT influence the Intention to Use among university students. Specifically, the study examined not only the relationships between the variables mentioned earlier, such as Confirmation (CFM), Social Mood (SM), Self-Efficacy (SE), Task Technology Fit (TTF), and Satisfaction (STF), but also how they directly or indirectly influence Intention to Use.

Research Model and Hypotheses

Proposed Model vs. Alternative Model

The current study was conducted to explore the influence of variables on university students' Intention to Use ChatGPT for educational purposes, as well as the structural relationships among these variables. Drawing insights from prior research that effectively investigated learners' Intention to Use of new technologies in education (Mikalef et al., 2016; Wu & Chen, 2017), the proposed model was developed. Particularly, these previous studies provided valuable insights into exploring Intention to Use of new technologies in the educational field, thereby informing the formulation of the proposed model for the current study. However, there were several limitations in directly applying these prior studies to the model formulation in the current research. First, previous studies focused on the educational utilization of technologies other than ChatGPT. Second, they were conducted primarily with students from universities located in countries other than South Korea. Third, these studies did not specifically address Intention to Use of generative AI like ChatGPT. Considering the limitations of these related prior studies, it was necessary to incorporate additional research on AI.

In the current study, we explored the Intention to Use of generative AI rather than conventional technologies, focusing on research conducted in Asia, including South

Korea. Through this process, we sought to address the limitations of the previous studies mentioned earlier. For example, we referenced a study conducted in South Korea on the Intention to Use of a generative AI-based digital mental health management system (MyMentalPocket) (Park & Kim, 2023), as well as a study conducted in China on the mechanisms of user intention for AI-based chatbots (Le, 2023). Particularly, insights into ChatGPT's Intention to Use and the influencing variables were enriched through the study by Liu et al.(2022), which explored the structural relationships between Intention to Use of AI robots and influencing variables in China. Furthermore, by focusing on research that explores Intention to Use with an emphasis on AI, especially generative AI like ChatGPT, we could identify the aspects in which learners' intention to use ChatGPT should be investigated.

However, the studies mentioned above (Le, 2023; Liu et al., 2022; Park & Kim, 2023) examined intentions related to patient treatment or shopping, rather than focusing on education like our present study. This difference may be attributed to the relatively delayed adoption and utilization of AI in the educational sector compared to other domains. Therefore, drawing from a review of previous research exploring the intention to use new technologies in education (Mikalef et al., 2016; Wu & Chen, 2017) and generative AI (Le, 2023; Liu et al., 2022; Park & Kim, 2023), we established the proposed model for our current study. Additionally, we designated Social Mood (SM) and Self-Efficacy (SE) as exogenous variables, Confirmation (CFM), Task Technology Fit (TTF), and Satisfaction (STF) as mediating variables, and Intention to Use (IU) as the dependent variable. Furthermore, we structured the relationships among variables influencing college students' intention to use ChatGPT for educational purposes. To address potential limitations arising from differences between the prior studies utilized in model formulation and the present research, we developed three alternative models in addition to the proposed model. The proposed model and Alternative Models 1, 2, and 3 developed in our current study are illustrated in Figure 1.

SM (Social Mood), CFM (Confirmation), SE (Self-Efficacy), TTF (Task Technology Fit), STF (Satisfaction), IU (Intention to Use)
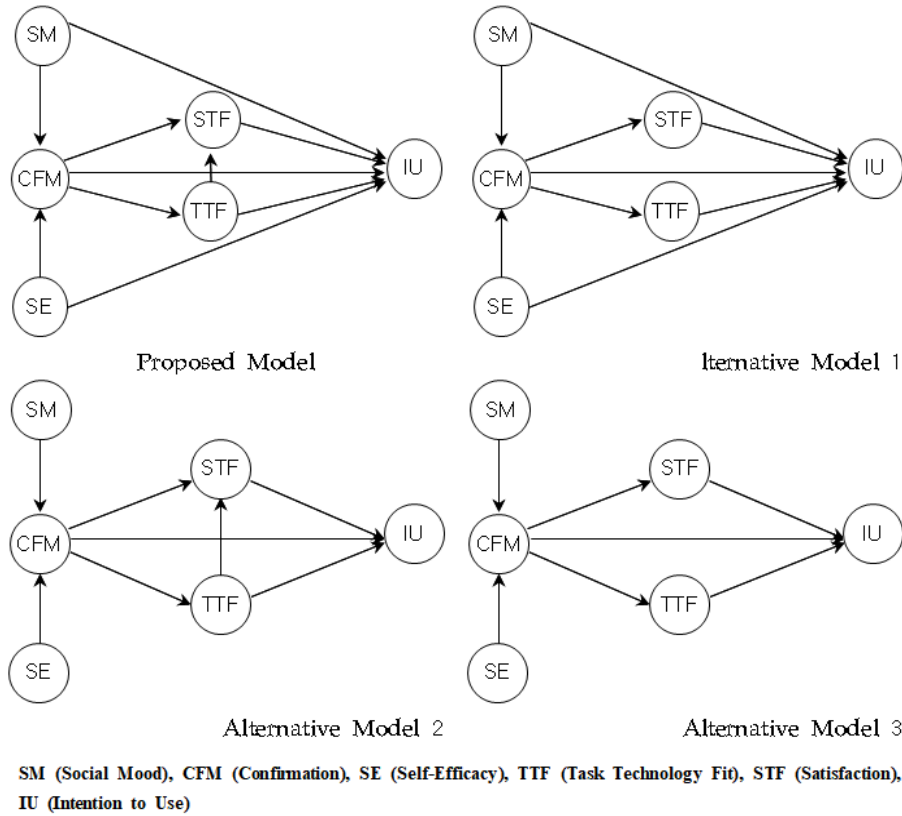
Figure 1. Proposed model and alternative models

Operational Definitions and Hypotheses of Research Variables

The operational definitions for the variables established in this study are presented in Table 1.

The hypotheses established in this study are as follows (see Table 2 in detail).

Table 1
Operational definitions of research variables

Category	Variable	Operational Definition	References
Exogenous	Social Mood	The degree to which an individual perceives or perceives how they are perceived by the university community or surrounding peers, seniors, or juniors in relation to the educational use of ChatGPT newly introduced and implemented at the university, including perceptions, preferences, understanding, likability, etc.	Cioc et al. (2023) Mikalef et al. (2016) Saxena & Doleck (2023) Sun et al (2008) Vorderer et al. (2019) Wang et al. (2018) Zhang et al. (2023)
	Self-Efficacy	The degree to which one believes or judges their ability to use ChatGPT effectively for academic purposes without prior experience or assistance from others, but with simple guidance, to achieve academic goals effortlessly.	Compeau & Higgins (1995) Chang & Tung (2008) Ferdousi & Levy (2010) Gong et al. (2004) Song (2023) Sun et al (2008)
Mediating	Confirmation	The degree of alignment between users' pre-existing expectations and personal experiences following the actual use of ChatGPT for educational purposes, as well as the degree of alignment between the fidelity, accuracy of the provided knowledge or information, and the resulting academic performance.	Al-Mamary et al. (2023) Bhattacherjee (2001) Chandradasa & Galhena (2022) Dai et al (2020) Dhiman & Jamwal (2022)
	Task Technology Fit	The degree to which users' learning activities through ChatGPT align with acquiring university-level knowledge, understanding course content, performing assignments, and solving learning-related problems.	Dahri et al. (2024) DeLone & McLean (2003) Goodhue & Thompson (1995) Lin (2012) Pagani (2006)
	Satisfaction	The degree of satisfaction with knowledge and information acquisition, learning activities and participation, assignment completion and problem-solving, and academic performance through the educational use of ChatGPT.	Ajzen (1991) Ayyoub et al. (2023) Dhiman & Jamwal (2022) Ding (2019) Riva et al. (2019) Szymanski & Hise (2000)
Dependent	Intention to Use	The degree of intent to continue using ChatGPT in the future, degree of utilization in various learning activities and areas, and degree of recommending it to peers in the university community.	Bhattacherjee (2001) Dai et al (2020) Jeong (2023) Liu et al. (2022) Venkatesh & Davis (1996)

Table 2
Research hypotheses

No.	Hypotheses	Proposal	Alternative 1	Alternative 2	Alternative 3	References
H1	Social Mood regarding the educational use of ChatGPT will have a positive effect on Confirmation.	○	○	○	○	Lee & Lin (2008) Mikalef et al. (2017)
H2	Self-Efficacy regarding the use of ChatGPT will have a positive effect on Confirmation.	○	○	○	○	Gong et al. (2004) Mikalef et al. (2017) Sánchez & Hueros (2010)
H3	Confirmation regarding the use of ChatGPT will have a positive effect on Task Technology Fit.	○	○	○	○	Bhattacherjee (2001) Ho et al. (2014)
H4	Confirmation regarding the use of ChatGPT will have a positive effect on Satisfaction.	○	○	○	○	Al-Mamary et al. (2023) Alraimi et al. (2015) Dhiman & Jamwal (2022) Halilovic & Cicic (2013) Oliver & DeSarbo (1988)
H5	Task Technology Fit regarding the use of ChatGPT will have a positive effect on Satisfaction.	○	×	○	×	Alhendawi (2022) Alyoyssef (2021) Avlonitis & Panagopoulos (2005) Dahri et al. (2024) Lin (2012)
H6	Social Mood regarding the use of ChatGPT will have a positive effect on Intention to Use.	○	○	×	×	Jang (2023) Lee & Lin (2008) Mikalef et al. (2017) Saxena & Doleck (2023) Sun et al. (2008)
H7	Satisfaction resulting from the use of ChatGPT will have a positive effect on Intention to Use.	○	○	○	○	Ayyoub et al. (2023) Chiu et al. (2005) Lee (2010) Dhiman & Jamwal (2022) Hayashi et al. (2004) Lin & Lu (2011) Saxena & Doleck (2023)
H8	Confirmation regarding the use of ChatGPT will have a positive effect on Intention to Use.	○	○	○	○	Chang & Tung (2008) Maldonado et al. (2009) Mikalef et al. (2017)
H9	Task Technology Fit regarding the use of ChatGPT will have a positive effect on Intention to Use.	○	○	○	○	DeLone & McLean (2003) Larsen et al. (2009) Lin(2012) Ouyang et al. (2017) Wu & Chen (2017)
H10	Self-Efficacy regarding the use of CatGPT will have a positive effect on Intention to Use.	○	○	×	×	Bardakci & Alkan (2019) Ferdousi & Levy (2010) Mikalef et al. (2017) Song (2023)

Research Methodology

Participants

This study selected university students enrolled at A University or B University located in the metropolitan area of Seoul, South Korea, as research participants. The participants had prior experience attending a seminar on the use of generative AI. This seminar, a 60-minute program, was designed for students interested in the educational use of ChatGPT, providing guidance on practical application methods. The study focused exclusively on students who began using ChatGPT as a result of this seminar. The survey was conducted online for one week starting one month after the seminar ended. Participants who did not use ChatGPT after the seminar were excluded from the study. However, whether the participants started using ChatGPT due to the seminar was verified through the survey; there is a possibility that their responses may not accurately reflect their actual experiences. This limitation is considered a constraint of the study. 261 university students from University A or University B in the Seoul metropolitan area of South Korea participated in this study. Among them, the majority (37.5%) used ChatGPT primarily for tasks such as presentations or summarizing information. Additionally, some students engaged in personal interest exploration (28.4%), report writing (11.5%), foreign language learning, especially English (9.2%), and creative activities (5.0%) using ChatGPT. Regarding their feelings about the educational use of ChatGPT, participants expressed that they believed it would be useful (64.8%) or convenient (29.5%) when used properly, while some had no particular feelings (5.7%). The average weekly frequency of ChatGPT usage among participants was highest for 1-2 times (78.5%), followed by occasionally (11.5%), and 3-4 times (10.0%). The background variables of the participants in this study are presented in Table 3.

Table 3
Background characteristics of participants

	Category	Participants	Percentage (%)
Gender	Male	92	35.2
	Female	169	64.8
Grade	1st Year	11	4.2
	2nd Year	48	18.4
	3rd Year	159	60.9
	4th Year	43	16.5
Age Group	Under 20 years old	16	6.1
	21 ~ 22 years old	129	49.4
	23 ~ 24 years old	78	29.9
	25 years old and above	38	14.6
Main Purposes of Using ChatGPT	Presentation or Summary Preparation	98	37.5
	Report Writing	30	11.5
	Learning Foreign Languages	24	9.2
	Exploring Personal Interests	74	28.4
	Creative Activities	13	5.0
	Others, including Unsure	22	8.4
Primary Device used for Accessing ChatGPT	Smartphone	47	18.0
	Tablet	12	4.6
	Laptop	190	72.8
	Desktop	12	4.6
Frequency of Access per Week	1~2 times	205	78.5
	3~4 times	26	10.0
	Frequent	30	11.5
Personal Feelings about Educational Use of ChatGPT	Convenience when Used Properly	77	29.5
	Usefulness when Used Properly	169	64.8
	No Particular Feeling	15	5.7
Self-assessment of ChatGPT Usage Level	High Level	57	21.8
	Medium Lever	140	53.6
	Low Level	37	14.2
	Not sure	27	10.3
Total		261	100.00

Research Instrument

The research instruments in this study can be broadly categorized into items aimed at exploring the background variables of the research participants and the constituent variables of the proposed model.

Background variables questions

Background characteristics in this study encompass gender, grade, age group, primary purposes and devices for ChatGPT usage, weekly access frequency, personal sentiments regarding its educational use, and level of usage.

Construct variables questions

The proposed model includes Social Mood (SM), Self-Efficacy (SE), Confirmation (CFM), Task Technology Fit (TTF), Satisfaction (STF), and Intention to Use (IU). Survey items for these constructs were adapted from relevant prior studies. Specifically, SM items were modified from Hsu & Lin (2008) and Mikalef et al. (2016), tailored to ChatGPT's educational context. SE items were based on Compeau & Higgins (1995) and others, while CFM, TTF, STF, and IU items were adapted from sources such as Chiu et al. (2005), Hsu & Lin (2008), Kim et al. (2010), and Szymanski & Hise (2000). However, previous studies primarily focused on the educational use of technologies like mobile devices, ICT, and MOOCs. However, these measurement items may not be suitable for examining factors influencing the intention to use ChatGPT, a generative AI tool that serves as a collaborative partner in diverse learning activities. Additionally, most prior research was conducted before the widespread adoption of technology post-COVID-19, which has altered learners' perspectives on technology use. Given these differences in technology type, scope, and learning environment, directly applying previous survey items to this study would be challenging. Therefore, new survey items were specifically developed for this research.

The process of developing suitable measurement items involved several steps. First, 5-6 items per variable were selected from previous studies with input from two educational experts experienced in ChatGPT use. These items were then modified to fit ChatGPT's educational context in collaboration with the research team. Next, three university students with ChatGPT experience reviewed and refined the items for practical applicability. Content validity was assessed by ten Ph.D. experts, leading to the removal of eight items that did not meet the CVR threshold of .62. Finally, a pilot test with 167 students resulted in a finalized research instrument with 16 items (4 per variable) on a 5-point scale. The research tool showed strong sampling adequacy with a Kaiser-Meyer-Olkin measure of .910, and Bartlett's test of sphericity was significant (6102.888, $p<.001$). The study employed descriptive statistics, correlation analysis, exploratory factor analysis, and structural equation modeling to examine the relationships among variables. Survey items used are detailed in Table 4.

Table 4
Survey questions

Variables	Items	Main Contents	References
Social Mood (.914)*	SM1	Community or general perception of ChatGPT	Hsu & Lin (2008) Mikalef et al. (2016) Zhang et al. (2023)
	SM2	Preference level of ChatGPT in the community	
	SM3	Understanding level of ChatGPT in the community	
	SM4	Favorability level of ChatGPT in the community	
Self Efficacy (.923)	SE1	Ability to use ChatGPT without prior experience	Bardakci & Alkan (2019) Shih (2008) Compeau & Higgins (1995) Ferdousi & Levy (2010) Mikalef et al. (2016)
	SE2	Ease of using ChatGPT without difficulty	
	SE3	Ability to use ChatGPT without assistance from others	
	SE4	Ability to use ChatGPT with simple guidance	
Confirmation (.930)	CFM1	Degree of alignment between expectations and educational use experience of ChatGPT	Dai et al (2020) Dhiman & Jamwal (2022) Hsu & Lin (2008) Mikalef et al. (2016) Sanchez-Franco (2010)
	CFM2	Degree of alignment regarding the fidelity of knowledge and information provided by ChatGPT	
	CFM3	Degree of alignment regarding the accuracy of knowledge and information provided by ChatGPT	
	CFM4	Degree of alignment regarding the academic performance through ChatGPT	

Table 4

Survey questions   *(continued)*

Variables	Items	Main Contents	References
Task Technology Fit *(.955)*	TTF1	Suitability of ChatGPT for acquiring university-level knowledge	Holzinger et al. (2011) Kim et al. (2010) Larsen et al. (2009) Lin (2012) Lu & Yang (2014) Yu & Yu (2010)
	TTF2	Suitability of ChatGPT for understanding course content	
	TTF3	Suitability of ChatGPT for assignments at the university level	
	TTF4	Suitability of ChatGPT for academic problem-solving	
Satisfaction *(.928)*	STF1	Level of satisfaction with the knowledge and information provided by ChatGPT	Bhattacherjee (2001) Dhiman & Jamwal (2022) Smith et al. (2003) Szymanski & Hise (2000)
	STF2	Satisfaction with learning activities and participation through ChatGPT	
	STF3	Satisfaction with assignments and problem-solving through ChatGPT	
	STF4	Satisfaction with academic outcomes derived through ChatGPT	
Intention to Use *(.949)*	IU1	Willingness to continue using ChatGPT in the future	Chiu et al. (2005) Dai et al (2020) Davis (1989) Dhiman & Jamwal (2022) Lu & Yang (2014) Venkatesh & Davis (1996, 2000) Wu & Zhang (2014)
	IU2	Willingness to use ChatGPT in various learning activities	
	IU3	Willingness to use ChatGPT in various non-academic areas	
	IU4	Willingness to recommend ChatGPT to peers and juniors	

* Cronbach'α

Results

Descriptive Statistics and Correlation Analysis among Measurement Variables

In order to apply structural equation modeling (SEM), it's crucial to assess whether the collected data follows a normal distribution. In the current study, based on the criterion that "skewness less than 2 and kurtosis less than 7 indicate normality" (Kline, 2016), the multivariate normality of the collected data was analyzed. The analysis

revealed that mean of each variable ranged from a minimum of 3.34 to a maximum of 3.78, with standard deviations ranging from a minimum of 0.867 to a maximum of 1.069. Particularly, the skewness ranged from an absolute minimum value of 0.027 to a maximum of 0.625, and the kurtosis ranged from an absolute minimum value of 0.046 to a maximum of 0.695, all meeting the criteria. Thus, the multivariate normality was confirmed.

Validation of measurement model

In this study, the measurement model was validated through goodness-of-fit and validity.

Fitness

In the current study, the fitness was evaluated based on indices such as χ^2/df, CFI, NFI, IFI, GFI, and RMSEA. The analysis yielded the following results: CMIN=518.641 (p=.000), χ^2/df=2.188, CFI=.953, NFI=.918, IFI=.954, GFI=.860, RMSEA=.068, all of which met the standard criteria (see Table 5 for details).

Table 5
Analysis of fitness

	χ^2	p	$\chi2/df$	CFI	NFI	IFI	GFI	RMSEA
Measurement model values	518.641	.000	2.188	.953	.918	.954	.860	.068
Criterion	-		≤3.0	≥.9	≥.9	≥.9	≥.8	≤ .05 - .08

Validity

The validity of this study was verified by examining the factor loadings of each path and the correlations between variables. According to Hair et al. (1998), factor loadings above .30 indicate adequate measurement of corresponding latent variables. The results of verification revealed factor loadings ranging from .769 to .944,

significant at .05. Additionally, correlations between measurement variables ranged from .36 to .581. These findings confirm the suitability of the current measurement variables for use in structural equation modeling.

Hypothesis Testing

The results of hypothesis testing indicated that out of the total 10 hypotheses, 8 hypotheses were found to be significant (p<.05), excluding 'Social Mood → Intention to Use' and 'Self-Efficacy → Intention to Use'. The specific results of hypothesis testing in this study are presented as follows.

First, both Social Mood and Self-Efficacy significantly influenced Confirmation, supporting hypotheses 1 and 2. Social Mood (β=.390, p<.001) exhibited a greater impact on Confirmation compared to Self-Efficacy (β=.350, p<.01). Second, Confirmation significantly affected Satisfaction and Task Technology Fit, supporting hypotheses 3 and 4. Task Technology Fit (β=.477, p<.001) showed a stronger influence compared to Satisfaction (β=.210, p<.01). Additionally, Task Technology

Table 6
Validation of research hypotheses

No.	Path			SPC	UPC	S.E.	C.R.	p	Result
h1	Confirmation	←	Social Mood	.390	.406	.066	6.113	***	○
h2	Confirmation	←	Self-Efficacy	.350	.356	.063	5.610	***	○
h3	Satisfaction	←	Confirmation	.210	.219	.068	3.211	.001	○
h4	Task Technology Fit	←	Confirmation	.477	.527	.068	7.707	***	○
h5	Satisfaction	←	Task Technology Fit	.447	.422	.062	6.758	***	○
h6	Intention to Use	←	Social Mood	.060	.077	.082	.941	.347	×
h7	Intention to Use	←	Satisfaction	.197	.230	.078	2.970	.003	○
h8	Intention to Use	←	Confirmation	.376	.459	.096	4.761	***	○
h9	Intention to Use	←	Task Technology Fit	.125	.138	.074	1.867	.062	○
h10	Intention to Use	←	Self-Efficacy	.065	.081	.078	1.036	.300	×

*p<.05, **p<.01, ***P<.001 SPC (Standardized Path Coefficients), UPC (Unstandardized path coefficients)

Fit significantly influenced Satisfaction (β=.447, p<.001), supporting hypothesis 5. Third, Satisfaction, Confirmation, and Task Technology Fit significantly influenced Intention to Use. However, the effects of 'Social Mood → Intention to Use' and 'Self-Efficacy → Intention to Use' were not significant. Thus, hypotheses 7, 8, and 9 were supported, while hypotheses 6 and 10 were rejected. Among these variables, Confirmation (β=.376, p<.001) had the greatest impact on Intention to Use, followed by Satisfaction (β=.197, p<.01), and Task Technology Fit (β=.125, p<.05) (see Table 6 for details).

Comparison and analysis of fit between proposed model and alternative model

In this study, the fit between the proposed model and alternative models was evaluated based on maximum likelihood estimation, resulting in the rejection of the null hypothesis (p<.001). As mentioned earlier, the null hypothesis of "model-data fit" is overly strict (MacCallum, Browne, & Sugawara, 1996), which often leads to many research models being rejected in fit tests (χ^2). Therefore, in this study, the fit between the proposed model and alternative models was compared and analyzed using key fit indices such as χ^2/df, CFI, NFI, IFI, GFI, and RMSEA. The analysis revealed that the fit of alternative model 2 was superior to the proposed model and other alternative models 1 and 3 across all indices. Consequently, alternative model 2 was selected as the final model in this study. The detailed content is presented in Table 7 below.

Table 7
Analysis of fit between proposed model and alternative models

Models		χ^2	χ^2/df	CFI	NFI	IFI	GFI	RMSEA
Proposed	Model	590.493	2.450	.942	.907	.942	.844	.075
Alternative	Model 1	635.318	2.625	.935	.899	.935	.829	.079
Alternative	Model 2	592.409	2.438	.942	.906	.942	.844	.074
Alternative	Model 3	637.189	2.611	.935	.899	.935	.829	.079

Exploring the direct and indirect effects of variables influencing the intention to use ChatGPT

In this study, alternative model 2 was chosen as the final model. Additionally, based on bootstrapping, the structural relationships between variables and their direct, indirect, and total effects on the educational use of ChatGPT, as indicated by intention to use, were analyzed. The specific findings are as follows. First, Social Mood significantly influenced intention to use through Confirmation, Task Technology Fit, and Satisfaction as mediators. For instance, paths such as Social Mood → Confirmation → Task Technology Fit → Satisfaction → Intention to Use, Social Mood → Confirmation → Satisfaction → Intention to Use, and Social Mood → Confirmation → Intention to Use were identified (β=.228, p<.05). Second, Self-Efficacy significantly influenced intention to use through Confirmation, Task Technology Fit, and Satisfaction as mediators. Paths like Self-Efficacy → Confirmation → Task Technology Fit → Satisfaction → Intention to Use, Self-Efficacy → Confirmation → Satisfaction → Intention to Use, and Self-Efficacy → Confirmation → Intention to Use were identified (β=.204, p<.05). Third, Confirmation significantly influenced intention to use through Task Technology Fit and Satisfaction as mediators. Paths such as Confirmation → Task Technology Fit → Satisfaction → Intention to Use, Confirmation → Satisfaction → Intention to Use, and Confirmation → Intention to Use were identified (β=.582, p<.05). The detailed content is presented in Table 8 below.

Table 8
Analysis of factors influencing Intention to Use

A \ B	Confirmation			Task Technology Fit			Satisfaction			Intention to Use		
	D	ID	T	D	ID	T	D	ID	T	D	ID	T
SM	.393*	-	.393*	-	.187*	.187*	-	.166*	.166*	-	.228*	.228*
SE	.351*	-	.351*	-	.167*	.167*	-	.149*	.149*	-	.204*	.204*
CFM				.477*	-	.477*	.210*	.213*	.423*	.421*	.161*	.582*
TTF							.447*	-	.447*	.140*	.100*	.240*
SAT										.223*	-	.223*

*p<.05, D (Direct), ID (Indirect) T (Total)

Conclusion

Discussion

The current study aims to explore the factors influencing the Intention to Use ChatGPT for educational purposes among South Korean university students. To achieve the research objective, this study established four models, including the proposed model and alternative models 1, 2, and 3, among which "alternative model 2" was selected as the optimal model. Furthermore, based on the optimal model, the current study investigated the influence of variables on the intention to use ChatGPT for educational purposes among university students. The following discussion elaborates on the results obtained from this research.

First, it was observed that the educational use of ChatGPT partially meets the expectations of South Korean university students. Through this study, it was confirmed that Confirmation, directly influenced by Social Mood and Self-Efficacy, significantly impacts the intention to use ChatGPT. These findings suggest that South Korean university students are partially satisfied with the educational use of ChatGPT, as initially anticipated. Furthermore, the results support previous research that emphasized the close relationship between Confirmation and Intention to Use (Maldonado et al., 2009; Mikalef et al., 2017). Additionally, the current study reveals that the influence of Confirmation on the intention to use ChatGPT is relatively stronger compared to other variables. This finding diverges from previous studies (Lin & Lu, 2011), where intention to use technology was primarily influenced by Satisfaction. The current study underscores the significance of Confirmation in the educational use of ChatGPT, unlike previous research. Moreover, it suggests that the innovative aspects of ChatGPT, which have not been extensively explored in previous studies, could be attributed to its characteristics since its widespread adoption in 2023. Specifically, the changing Social Mood is expected to increase expectations for new technology, leading users to perceive ChatGPT positively, thus

influencing their intention to use it. This highlights the role of Confirmation as a crucial determinant in a new educational environment, suggesting its potential contribution to exploring the impact of new technology adoption.

Second, it was evident that Satisfaction significantly influences the intention to use ChatGPT for educational purposes among South Korean university students. These findings indicate that South Korean university students are satisfied with the learning activities, content, and outcomes through the educational use of ChatGPT. Furthermore, the results support previous research highlighting the close relationship between Satisfaction and Intention to Use (Chiu et al., 2005; Lin & Lu, 2011). However, an interesting finding from this study is that Satisfaction's influence on the intention to use ChatGPT is relatively smaller compared to Confirmation. Previous research on technology adoption (Roca & Gagne, 2008) has considered Satisfaction as a key determinant influencing intention to use technology. However, in the current study, Confirmation was found to have a greater impact on the intention to use ChatGPT than Satisfaction. The difference between this study and previous studies' findings could be attributed to the inherent characteristics of ChatGPT as a new technology. As mentioned earlier, in the field of artificial intelligence, ChatGPT's expectations for future use tend to have a significant impact, especially considering its status as a cutting-edge technology in South Korean higher education since 2023 (Han, 2023; Jang & So, 2023). In contrast, the concept of Satisfaction is a fundamental notion in traditional industries (Riva et al., 2019). Therefore, the difference between this study and previous research findings can be seen as a natural outcome of the difference between the future-oriented ChatGPT and traditional technologies.

Third, it was evident that Social Mood and Self-Efficacy indirectly influence South Korean university students' intention to use ChatGPT for educational purposes. The results of this study support previous research indicating a close relationship between Social Mood and Confirmation (Mikalef et al., 2017; Lee & Lin, 2008), as well as between Self-Efficacy and Confirmation (Mikalef et al., 2017; Sánchez & Hueros,

2010). Additionally, the findings of this study clearly demonstrate that South Korean university students' intention to use ChatGPT is significantly influenced by the social atmosphere and self-efficacy associated with the technology. This perception of South Korean university students' intention to use ChatGPT is a particularly interesting phenomenon, as technology adoption has traditionally heavily relied on user satisfaction. Accordingly, user satisfaction has been considered a crucial determinant of the intention to use a specific technology, while user dissatisfaction has been regarded as a major factor decreasing the intention to use that technology (Seo, 2021). However, the results of this study represent a significant departure from previous research, indicating that South Korean university students' intention to use ChatGPT is largely influenced by their perception of the surrounding atmosphere, self-efficacy, and social mood. Particularly, considering the well-developed online community and the significant influence of online influencers in South Korea (M. Park, 2023), it can be inferred that South Korean university students' intention to use ChatGPT is greatly influenced by the social mood shaped by online reviews and discussions.

Therefore, the current research results provide clear evidence that individual decision-making is significantly influenced by the social atmosphere linked to the individual, as also observed in ChatGPT's intention to use. However, such formed user intentions may fluctuate depending on the surrounding environment, user satisfaction, changes in mood, and other factors. In particular, technology adoption not based on user satisfaction may ultimately diminish if the surrounding mood or individual perceptions change. For example, platforms like the metaverse were actively used based on societal mood and personal curiosity during the COVID-19 pandemic, but gradually diminished with the rapid changes in social environments and the normalization of face-to-face education post-pandemic. If ChatGPT follows a similar fate as the metaverse, it may soon fade away. From this perspective, the current study provides significant insights into how South Korean university students' intentions related to ChatGPT can be influenced by surrounding mood and

changes.

Implication

Based on this study, the implications for the continued use of ChatGPT in universities are as follows.

First, universities must provide regular seminars and workshops to maximize the educational use of ChatGPT. The findings of this study indicate that the use of ChatGPT plays a positive role in meeting college students' expectations. Therefore, it is essential to implement systematic and ongoing educational programs that enable students to learn the functions of ChatGPT and its practical applications, thereby enhancing their positive expectations about the technology. In particular, universities should seek effective methods to integrate ChatGPT into various learning activities, such as team projects and report writing, so that students can gain hands-on experience with the technology.

Second, it is crucial to foster a positive educational atmosphere within universities to encourage the proper use of ChatGPT. The research findings suggest that social mood and self-efficacy indirectly have a significant impact on the intention to use ChatGPT. Based on this, universities should actively promote successful ChatGPT use cases and establish platforms for sharing user experiences, thereby disseminating positive perceptions among students. Additionally, it is important to provide guidance on improper use cases to help students learn the correct usage methods. These measures will enhance trust in ChatGPT and contribute to maximizing the effectiveness of its educational use.

Third, universities must actively develop measures to enhance college students' self-efficacy related to the use of ChatGPT. This study has demonstrated that self-efficacy associated with ChatGPT usage significantly influences the intention to use it. Therefore, universities should implement various educational support programs that empower students to feel confident in using ChatGPT. Creating an environment

through mentoring and hands-on activities will allow students to accumulate practical experience and boost their self-efficacy. Such support will enable students to utilize ChatGPT more effectively, ultimately improving the quality of learning.

These implications present specific action plans for the sustained use of ChatGPT, contributing to the innovation of the educational environment in universities.

The current study has several limitations that warrant caution in applying and interpreting the results. First, there are limitations associated with the participants of this study. The research was conducted exclusively on South Korean university students, who tend to be relatively proactive in the field of information communication technology (ICT) development and educational utilization. Second, limitations are related to the research variables. The study did not encompass all potential variables influencing the intention to use ChatGPT but rather focused on key ones. Third, factors such as the type of courses utilizing ChatGPT educationally or learner characteristics were not considered in this study. Nonetheless, given that this study specifically targeted South Korean university students, who have increasingly embraced ChatGPT in higher education since 2023, it offers valuable insights into the growing utilization of ChatGPT among university students. Looking ahead, future research is expected to address these limitations by minimizing them, broadening the scope of the target population, diversifying the variables considered, and conducting more in-depth studies that take into account learner characteristics and course types.

References

Agarwal, R. & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about IT. *MIS Quarterly, 24*(4), 665-694.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Alhendawi, K. M. (2022). Task-technology fit model: Modelling and assessing the nurses' satisfaction with health information system using AI prediction models. *International Journal of Healthcare Management. , 17*(1), 12-24.

Al-Mamary, Y. H., Abubakar, A. A., & Abdulrab, M. (2023). The effects of the expectation confirmation model (ECM) and the technology acceptance model (TAM) on learning management systems (LMS) in sub-saharan Africa. *Interactive Learning Environments*, 1–17. https://doi.org/10.1080/10494820.2023.2191272

Alraimi, K., Zo, H., & Ciganek, A. (2015). Understanding the MOOCs continuance: The role of openness and reputation. *Computers & Education, 80*, 28-38.

Andaleeb, S. S., & Conway, C. (2006) Customer Satisfaction in the Restaurant Industry: An Examination of the Transaction-Specific Model. *Journal of Services Marketing, 20*, 3-11.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral Change. *Psychological Review, 84*(2), 191-215.

Bardakci, S., Alkan, M. (2019). Investigation of Turkish preservice teachers' intentions to use IWB in terms of technological and pedagogical aspects. *Educ Inf Technol 24,* 2887-2907.

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation–confirmation model. *MIS Quarterly, 25*(3), 351-370.

Cha, M., & Im, H. J. (2023). A study on university professors' perception on educational applicability of ChatGPT in English classes. *Culture and Convergence, 45*(5), 109-118.

Chandradasa, I., & Galhena, B. L. (2022). Continuous intention of using zoom for e-

learning: Empirical evidence from management undergraduates in University of Ruhuna, Sri Lanka. *Journal of Management Matters, 9*(1), 27-52.

Chang, S., & Tung, F. (2008). An empirical investigation of students' behavioural intentions to use the online learning course websites. *British Journal of Educational Technology, 39*(1), 71-83.

Chiu, C., Hsu, M., Sun, S., Lin, T., & Sun, P. (2005). Usability, quality, value and e-learning continuance decisions. *Computers & Education, 45*(4), 399-416.

Cho, S. H. (2004). The determinant factors influenced on the satisfaction of the university physical activity class: Focused on expectancy-disconfirmation model. *Korean Journal of Sport Science, 15*(2), 63-73.

Cho, Y. H., Lee, J., Lim, K. Y., Jeong, H., & Han, I. (2023). Future education with generative AI: From machine to collaborative partner. *Journal of Educational Technology, 39*(4), 1449-1478.

Choi, M., & Roh, H. R. (2023). Perception factors of usefulness and limitation of ChatGPT that affect university students' intention to use ChatGPT. *Asia-pacific Journal or Convergent Research Interchange, 9*(10), 523-532.

Cioc, M. M., Popa, '. C., Olariu, A. A., Popa, C. F., & Nica, C. B. (2023). Behavioral intentions to use energy efficiency smart solutions under the impact of social influence: An extended TAM approach. *Applied Sciences. 13*(18), 10241.

Compeau, D., & Higgins, C. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly, 19*(2), 189-211.

Dahri, N. A., Yahaya, N., Al-Rahmi, W. M., Almogren, A. S., & Vighio, M. S. (2024). Investigating factors affecting teachers' training through mobile learning: Task technology fit perspective. *Educ Inf Technology. 29*, 14553-14589.

Davis, F. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technologies. *MIS Quarterly, 13*(3), 319-340.

Delone, W. H., & Mclean, E. R. (2003). The delone and mclean model of information system success: A ten-year update. *Journal of Management Information Systems, 19*, 9-30.

Dhiman, N., & Jamwal, M. (2022). Tourists' post-adoption continuance intentions of chatbots: Integrating task–technology fit model and expectation–confirmation theory. *Foresight, 25*(2), 209-224.

Ding, Y. (2019). Looking forward: The role of hope in information system continuance. *Computers in Human Behavior, 91*, 127-137.

Esmaeili, M., Nazarpoori, A., & Najafi, M. (2013). An investigation on loyalty formation model in e-banking customers. *Management Science Letters, 3*, 903-912.

Ferdousi, B. & Levy, Y. (2010). Development and validation of a model to investigate the impact of individual factors on instructors' intention to use e-learning systems. *Interdisciplinary Journal of E-Learning and Learning Objects, 6*(1), 1-21.

Gong, M., Xu, Y., & Yu, Y. (2004). An enhanced technology acceptance model for web-based learning. *Journal of Information Systems Education, 15*(4), 365-374.

Goodhue, D., Thompson, R. (1995). Task-technology fit and individual performance. *MIS Quarterly, 19*(2), 213-236.

Grewal, D., Krishnan, R., Baker, J., & Borin, N. (1998). The effect of store name, brand name and price discounts on consumer's evaluation and purchase intentions. *Journal of Retailing, 74*(3), 331-352.

Halilovic, S., & Cicic, M. (2013). Antecedents of information systems user behaviour-extended expectation-confirmation model. *Behaviour* & *Information Technology, 32*(4), 359-370.

Hill, T., Smith, N. D., & Mann, M. F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of Applied Psychology, 72*(2), 307-313.

Holzinger, A., Searle, G., & Wernbacher, M. (2011). The effect of previous exposure to technology on acceptance and its importance in usability and accessibility engineering. *Universal Access in the Information Society, 10*(3), 245-260.

Hong, H., Kang, Y. J., Kim, Y., & Kim, B. (2023). Application of artificial intelligence in medical education: Focus on the application of ChatGPT for clinical medical education. *The Journal of Medicine and Life Science, 20*(2), 53-97.

Hsu, C., & Lin, J. (2008). Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation. *Information and Management, 45*(1), 65-74.

Igbaria, M., & Iivari, J. (1995). The effects of self-efficacy on computer usage. *Omega, 23*(6), 587-605.

Jeon, J. (2023). A study on the response status and improvements to ChatGPT in university education. *Cultural Exchange and Multicultural Education, 12*(4), 517-548.

Jeong, H. (2023). Exploring learner acceptance of ChatGPT for educational utilization: focusing on the structural relationships among perceived ease of use, perceived usefulness, attitude, and intention to continuously use. *Journal of research in education, 36*(4), 1-26.

Jung, H., & Park, J. H. (2023). Design and issues of writing literatures using ChatGPT. *Journal of Knowledge Information Technology and Systems, 18*(1), 31-40.

Keon, S. K., & Lee, Y. T. (2023). Investigating the performance of generative AI ChatGPT's reading comprehension ability. *Journal of the Korea English Education Society, 22*(2), 147-172.

Kim S. C. (2023). Current status and future directions of AI utilization guidelines in universities. *Knowledge & Liberal arts, 13*, 11-44.

Kim, H. J., & Oh, S. (2023). Analysis of the Intention to use ChatGPT in college students' assignment performance- focusing on the moderating effects of personal innovativeness. *Culture and Convergence, 45*(6), 203-214.

Kim, I. (2023). A case study on the application of ChatGPT in the start-up course in university. *The Journal of Education Consulting & Coaching, 7*(4), 81-94.

Kim, J. H., Bai, L. Z., & Byun, J. W. (2015). The impact of tourism mobile app characteristic on perceived value, user satisfaction, continuous use intention: Focused on Chinese tourist. Journal of *Tourism and Leisure Research, 27*(9), 5-22.

Kim, S., Kim, J., Choi, M. J., & Jeong, S. H. (2023). Evaluation of the applicability of ChatGPT in biological nursing science education. *Journal of Korean Biological Nursing Science, 25*(3), 183-204.

Kim, T., Suh, Y., Lee, G., & Choi, B. (2010). Modelling roles of task-technology fit and self-efficacy in hotel employees' usage behaviours of hotel information systems. *International Journal of Tourism Research, 12*(6), 709-725.

Kim, W. (2023). Analysis of the educational effects regarding the use of ChatGPT in compulsory basic coding subjects. *Korean Journal of General Education, 17*(5), 113-123.

Kiy, H. (2023). A study on writing experience with ChatGPT of college students. *Culture and Convergence, 45*(9), 853-868.

Kline, R. B. (2016*). Principles and Practice of Structural Equation Modeling (4th ed.).* New York, NY: The Guilford Press.

Koo, Y., & Hong, M. (2023). A study on writing practice of beginner German learners using ChatGPT. *Zeitschrift fur Deutsche Sprache und Literatur, 100*, 47-69.

Larsen, T., Sorebo, A., & Sorebo, O. (2009). The role of task-technology fit as users' motivation to continue information system use. *Computers in Human Behavior, 25*(3), 778-784.

Le, X. C. (2023). Inducing AI-powered chatbot use for customer purchase: The role of information value and innovative technology. *Journal of Systems and Information Technology, 25*(2), 219-241.

Lee, C. E. (2023). Structural relationship analysis between ChatGPT characteristics, perceived usefulness, and continuous use intention: Focusing on college students majoring in hotel and food service management. *Korea Academic Society of Hotel Administration, 32*(5), 61-76.

Lee, E. H., & Park, M. R. (2023). Exploring the relationship between undergraduate students' self-rgulated learning (SRL) abilities and the perception and purpose of use for ChatGPT in English language learning. *English Language* & *Literature Teaching, 29*(4), 71-99.

Lee, J. (2023). A case study on writing a self-introduction letter in University liberal education using ChatGPT. *Culture and Convergence, 45*(9), 193-208.

Lee, M. (2010). Explaining and predicting users' continuance intention toward e-

learning: An extension of the expectation-confirmation model. *Computers & Education, 54*(2), 506-516.

Lee, M. (2023). A study on university student users' perception and experience of ChatGPT. *Dongainmunhak, 65*, 1-26.

Lee, V., & Lin, S. (2008). Podcasting acceptance on campus: An extension of the UTAUT model. *DIGIT 2008 Proceedings*, Paris, December 10-11, p. 3.

Lee, Y., Kim, C., & Ahn, H. (2023). A study on the ChatGPT: Focused on the news big data service and ChatGPT use cases. *Journal of the Korea Society of Digital Industry and Information Management, 19*(1), 139-151.

Lin, K., & Lu, H. (2011). Why people use social networking sites: An empirical study integrating network externalities and motivation theory. *Computers in Human Behavior, 27*(3), 1152-1161.

Lin, T., & Huang, C. (2008). Understanding knowledge management system usage antecedents: An integration of social cognitive theory and task technology fit. *Information & Management, 45*(6), 410-417.

Lin, W. (2012). Perceived fit and satisfaction on web learning performance: IS continuance intention and task technology fit perspectives. *International Journal of Human-Computer Studies, 70*(7), 498-507.

Liu, X., He, X., Wang, M., & Shen, H. (2022). What influences patients' continuance intention to use AI-powered service robots at hospitals? The role of individual characteristics. *Technology in Society, 70*, 101996.

Lu, H., & Yang, Y. (2014). Toward an understanding of the behavioral intention to use a social networking site: An extension of task-technology fit to social technology fit. *Computers in Human Behavior, 34*, 323-332.

Maldonado, U., Khan, G., Moon, J., & Rho, J. (2009). E-learning motivation, students' acceptance/use of educational portal in developing countries: A case study of Peru. In Proc. *4th ICCIT* (pp. 1431-1441).

Mikalef, P., Pappas, I., & Giannakos, M. (2016). An integrative adoption model of video-based learning. *The International Journal of Information and Learning Technology,*

33(4), 219-235.

Moran, E. T., & Volkwein, . F. (1992). The cultural approach to the formation of organizational climate. *Human Relations, 45*(1), 19-47.

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research, 17*, 460-469.

Olson, J., & Dover, P. (1979). Disconfirmation of consumer expectations through product trial. *Journal of Applied Psychology, 64*, 179-189.

Ouyang, Y., Tang, C., Rong, W., Zhang, L., Yin, C., & Xiong, Z. (2017). Task-technology fit aware expectation-confirmation model towards understanding of MOOCs continued usage. *Proceedings of the 50th Hawaii International Conference on System Sciences*, 174-183.

Pagani, M. (2006). Determinants of adoption of High Speed Data Services in the business market: Evidence for a combined technology acceptance model with task technology fit model. *Information* & *Management, 43*, 847-860.

Park, D. Y., & Kim, H. (2023). Ants of intentions to use digital mental healthcare content among university students, faculty, and staff: Motivation, perceived usefulness, perceived ease of use, and parasocial interaction with AI chatbot. *Sustainability, 15*(1), 872.

Park, J. O. (2023). Innovations and changes in AI-based ChatGPT in university education - focusing on major classes. *Journal of Consulting Convergence Research, 3*(3), 25-30.

Park, M. S. (2023). A study on the effects of influencer authenticity on parasocial interaction, parasocial relationship, and purchase intention in SNS. *Asia-pacific Journal or Convergent Recearch Interchange, 9*(9), 169-183.

Park, N. (2023). Navigating the paradigm of liberal arts education in the age of AI. *General Education and Citizen, 8*, 7-41.

Riva, F., Tunna, N. T., & Rubel, M. R. B. (2019). Employee quality performance, customer orientation and loyalty: Antecedent and outcome of customer satisfaction. *Asian Social Science, 15*(4), 37-48.

Roca, J., & Gagné, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computers in Human Behavior, 24*, 1585-1604.

Sánchez, R., & Huero, A. (2010). Motivational factors that influence the acceptance of Moodle using TAM. *Computers in Human Behavior, 26*(6), 1632-1640.

Sanchez-Franco, M. (2010). WebCT-the quasimoderating effect of perceived affective quality on an extending technology acceptance model. *Computers & Education, 54*(1), 37-46.

Saxena, A., Doleck, T. (2023). A structural model of student continuance intentions in ChatGPT adoption. *Eurasia Journal of Mathematics, Science and Technology Education, 19*(12), em2366.

Seo, K. (2021). Kiosks expansion in the foodservice industry: Integrated technology acceptance model including personal innovativeness, self-efficacy, enjoyment, and customer satisfaction. *Korea Academic Society of Hotel Administration, 30*(7), 73-92.

Seok, J. H., Choi, J, H., & Moon, S. H. (2017). Exploring the impact on smartphone expectations and purchase intention of consumers with early adopter tendencies using the PLS structural equation model. Proceedings presented at a conference at the Korean Association of Industrial Business Administration, 347-354.

Shamsudin, M. F., Yazid, M. F. M., Hasan, S., & Kadir, B.(2020). Review on service quality in fast food restaurant, customer satisfaction as mediator. *Journal of Critical Reviews, 7*(16), 997-1006.

Shon, D. (2023). Utilizing ChatGPT in writing classes-the possibilities and limitations. *Ratio et Oratio, 16*(2), 33-65.

Smith, A., Shankar, V., & Rangaswamy, A. (2003). Customer satisfaction and loyalty 11 in online and offline environments. *International Journal of Research Marketing, 20*(2), 153-175.

Song, Y. H. (2023). The influence of pre-service early childhood teachers' ICT efficacy and digital competency on intention to use digital in education.

Counseling Psychology Education Welfare, 10(5), 145-157.

Sun, P., Tsai, R., Finger, G., Chen, Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education 50*, 1183–1202.

Szymanski, D., & Hise, R. (2000). E-satisfaction: An initial examination. *Journal of Retailing, 76*(3), 309-322.

Tse, D., & Wilton, P. (1988). Models of consumer satisfaction formation: An extension. *Journal of Marketing Research, 25*(2), 204–212.

Vorderer, P., Hefner, D., Reinecke, L., & Klimmt, C. (2019). Permanently online permanently connected: Living and communicating in a POPC world. *Information, Communication*, & *Society, 22*(12), 1841-1844.

Wang, A. Y., & Newlin, M., H. (2002). Predictors of web-student performance: The role of self-efficacy and reasons for taking an on-line class. *Computers in Human Behavior, 18*(2), 151-163.

Wang, J. J., Wang, L. Y., & Wang, M. M. (2018). Understanding the effects of eWOM social ties on purchase intentions: A moderated mediation investigation. *Electronic Commerce Research and Applications, 28*, 54-62.

Webster, J., & Martocchio, J. J. (1995). The differential effects of software training previews on training outcomes. *Journal of Management, 21*(4), 757–787.

Wu, B., & Chen, X. (2017). Continuance intention to use MOOCs: Integrating the technology acceptance model(TAM) and task technology fit(TTF) model. *Computers in Human Behavior 67*, 221-232.

Wu, B., & Zhang, C. (2014). Empirical study on continuance intentions towards E-Learning 2.0 systems. *Behaviour* & *Information Technology, 33*(10), 1027-1038.

Yoon, Y. (2023). Artificial intelligence and accounting education：focusing on ChatGPT and its applications. *Korean Computers and Accounting Review, 21*(1), 1-20.

Yukl, G. (2006). *Leadership in Organizations* (6th ed.). Upper Saddle River, NJ: Pearson Education.

Zacharia, G., Moukas, P., & Maes, P. (2000). Collaborative reputation mechanisms in electronic marketplaces. *Decision Support Systems, 29*(4), 371-388.

Zhang, J., Bai, H., Lu, J., & Zheng, L. (2023). Problematic use of social media: The influence of social environmental forces and the mediating role of copresence. *Heliyon, 9*(1), e12959.

Zhang, Y. (2009). A study of corporate reputation's influence on customer loyalty based on PLS-SEM model. *International Business Research, 2*(3), 28-35.

Hanho JEONG

Professor, Deptartment of Education, Chongshin University.

Interests: AI, Edutech, Instructional Design

E-mail: hjeong@csu.ac.kr