Research on the Factors Affecting College Students' Behavioral Intention to Use Generative Artificial Intelligence in the Era of Intelligent Media — Based on the Theory of Planned Behavior

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Abstract:

In the contemporary era of intelligent media, the utilization of generative artificial intelligence (AI) has become a focal point of research, especially concerning the behavioral intentions of college students. This study aims to delve into the complex factors affecting college students' behavioral intentions toward using generative AI, with a theoretical foundation rooted in the thoroughly researched Theory of Planned Behavior. The primary focus of the research is to understand how the current wave of intelligent media influences college students' choices and intentions regarding the adoption of generative AI. This study aims to provide valuable insights into the subtle factors influencing college students' intentions to interact with generative AI. By bridging the theoretical framework with practical application, the research strives to offer feasible suggestions for educators, policymakers, and AI developers seeking to enhance the integration of generative AI in the academic field.

Keywords: Generative Artificial Intelligence, College Students, Behavioral Intention, Theory of Planned Behavior

1. Introduction

Artificial Intelligence (AI) is a branch of computer science that involves enabling machines to exhibit human-like thinking and acting capabilities. Generative Artificial Intelligence (GenAI) is a subfield of AI that involves generating new content or data. Generative design is a concept with a clear definition and process, distinct from traditional design methods. Its application areas are numerous and closely linked to artificial intelligence. As an important branch of AI research, generative artificial intelligence primarily refers to the AI technology that generates outcomes given input data conditions. Generative AI is one of the most active research directions in the AI field. It has brought new opportunities and challenges to the media industry's development, proposing that the media industry should actively embrace and use generative AI to promote intelligent transformation.[1](Liu, 2023)

The Theory of Planned Behavior (TPB) is a model widely used to predict and explain individual behavior, asserting that behavioral intentions are influenced by attitudes, subjective norms, and perceived behavioral control. (Stern, 2000; Staats, 2003). Armitage and Conner (2001) identified its application across 154 different contexts. The Theory of Planned Behavior[2](Ajzen, 1988) assumes that the best prediction of behavior is through asking individuals whether they intend to act in a certain way.

An analysis focusing on TPB's application in predicting entrepreneurial intentions and actions demonstrated its relevance and robustness in predicting entrepreneurial intentions and subsequent behaviors based on longitudinal survey data[3](Kautonen, van Gelderen, & Fink, 2015).

In the era of intelligent media, generative artificial intelligence, as an emerging technology, its application, and acceptance become the focus of research. Especially among college students, how these factors collectively influence their intentions to use GAI is a question worth exploring deeply.

Based on the Theory of Planned Behavior, this study will explore the following core constituent elements' impact on college students' use of GAI: 1. Attitude: Includes students' cognitive evaluations and emotional reactions to GAI, such as trust in technology, perceived usefulness, and cognition of potential risks. 2. Subjective Norms: Relates to social influences, such as peers, teachers, and family, on students' attitudes and behaviors. 3. Perceived Behavioral Control: Includes students' self-efficacy and control perception regarding the use of GAI.

This study aims to propose targeted strategies and suggestions by deeply understanding influencing factors, to

promote the effective application of generative artificial intelligence in the education field. The research outcomes are expected to provide useful references for educators, policymakers, and technology developers.

2. Literature Review

In the era of intelligent media, the rapid development of Generative Artificial Intelligence (GenAI) technology has attracted widespread attention, especially in the education and academic fields. As the main participants of this era, college students' behavioral intentions to use GenAI technology not only reflect the acceptance level of emerging technologies but also predict future societal technological development trends. This literature review aims to explore the factors affecting college students' behavioral intentions to use generative artificial intelligence in the era of intelligent media, based on the Theory of Planned Behavior (TPB). TPB posits that an individual's behavioral intentions are influenced by their attitudes, subjective norms, and perceived behavioral control[4](Ajzen 1991).

An individual's attitude towards GenAI—their positive or negative evaluation of using GenAI behavior—is considered a core factor affecting their intention to use it. Studies have shown that college students' cognition and attitudes towards GenAI technology are positively correlated with their usage intentions[5](Armitage & Conner 2001). Specifically, when students believe that GenAI can improve learning efficiency and promote innovative thinking, they are more likely to show a strong intention to use it [6](Godin & Kok, 1996).

Subjective norms – referring to the pressure that individuals feel important to others or groups feel that they should or should not undertake a specific behavior – also play an important role in the intention of GenAI use by college students. Peers, family members, teachers, and opinion leaders in social media have particularly significant influences on college students, and their attitudes and expectations can significantly influence students' acceptance of GenAI technology [7](Kepatuhan et al., 2008).

Perceived behavioral control — namely an individual's sense of self-efficacy and control to perform a specific behavior — is another key factor in determining their behavioral intentions. If college students think that they have the resources and ability needed to use GenAI, their intention to use it will be even stronger [9] (Sussman & Gifford, 2018). In addition, the availability and ease of use of technology use are also important factors affecting the control of perceived behavior [8](Kautonen et al., 2015).

Under this theoretical framework, recent studies have also explored other factors that may influence college students' intention to use GenAI, including knowledge level, privacy concerns, technology dependence, and innovative individual differences [9](Ajzen, 2011; Sussman & Gifford, 2018). The mechanisms and interactions of these factors provide insight into the new perspective of college students on the acceptance and use of GenAI technology.

In the era of intelligent media, college students' intention to use generative artificial intelligence is influenced by many factors, including but not limited to their attitude towards GenAI technology, the influence of subjective norms, and the degree of perceived behavioral control. The interaction of these factors constitutes a complex decision-making process, affecting the intention of college students to use GenAI technology.

3. Empirical Research

3.1 Questionnaire Design

In this study, to delve deeper into the factors affecting college students' behavioral intentions toward using generative artificial intelligence in the era of intelligent media, I referred to the research by [10](Chai, C. S., Wang, X., & Xu, C. (2020)) Their paper proposed a detailed survey questionnaire aimed at understanding students' willingness to learn about artificial intelligence.

The survey questionnaire was based on nine established constructs, encompassing a total of 27 items, all adopted or adapted from previous research. Responses were scored on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The first part of the questionnaire collected background data (grade, gender, major, and time spent on learning AI). The second part measured students' AI literacy, subjective norms, AI anxiety, perceived usefulness of AI, views on using AI for social good, attitudes towards using AI, confidence in AI, optimistic attitude towards AI, and behavioral intentions to engage in AI learning.

Descriptive Statistical Analysis

Table 1

Variable	Category	Frequency	Percentage (%)
Gender	Male	123	50.83
	Female	119	49.17
Grade	Freshman	50	20.67
	Sophomore	56	23.14
	Junior	79	32.64
	Senior	57	23.55
Experience with GenAI	Never used	34	14.05
	Occasionally used	101	41.74
	Frequently used	107	44.21

3.2.1 Basic Information

Gender distribution: Among the participants, 123 identified as male, and 119 as female. - Grade distribution: Participants were mainly distributed in the third year (79 people), fourth year (57 people), second year (56 people), and first year (50 people). - Major distribution: The most common majors included digital media arts, humanities education, national economic management, and physics, among others, indicating a diversity of participant backgrounds.

3.2.2 Usage Experience

Generative AI usage experience: 107 participants indicated having significant experience, 101 had some experience, and 34 had almost no experience.

3.2.3 Attitudes and Perceptions

Understanding and application knowledge: On average, participants scored over 2 points (on a scale from 1 to 3) regarding their understanding of how generative AI generates new textual content, its applications across various fields, and how it understands and generates human language, indicating they had a certain level of understanding and cognition.

3.3 Reliability Analysis

After conducting a reliability analysis, we obtained a Cronbach's alpha coefficient of 0.9415, which is a very high value, indicating the questionnaire performed well in terms of internal consistency. This means the questions in the questionnaire were statistically consistent when measuring related concepts or attitudes.

A high Cronbach's alpha coefficient suggests that participants' responses to various questions were statistically consistent, thereby supporting the assumption that these questions as a whole are effective in assessing specific concepts (such as attitudes, experiences, etc.).

3.4 Correlation Analysis

Table 2

Variable	r Value	p Value
AI Literacy	0.315849	5.247566e-07
Subjective Norms	0.331052	1.344081e-07
AI Anxiety	0.328784	1.654814e-07
Perceived Usefulness of AI	0.434465	1.458708e-12
Views on Using AI for Social Good	0.451938	1.389680e-13
Attitude Towards Using AI	0.665900	2.232390e-32
Confidence in AI	0.832351	1.903541e-63
Optimistic Attitude Towards AI	0.838970	2.315162e-65

These results reveal the magnitude and statistical significance of the correlations between various variables and the intention to engage in AI learning. Among them, confidence in AI and an optimistic attitude towards AI showed the strongest correlation with behavioral intention, with r values over 0.8, indicating a very strong positive correlation to engage in AI learning. While other variables also showed positive correlations, the degree of correlation was lower. All p values are very small indicating these correlations are statistically significant.

The relationships between various variables (including generative AI literacy, subjective norms, anxiety about using, perceived usefulness, social good, attitude, confidence in learning, and optimistic attitude) and the behavioral intention to use generative AI are as follows: - Generative AI Literacy (GAI Lit), Perceived Usefulness (PU), and Social Good (SG) showed a positive correlation with Behavioral Intention (BI), meaning individuals with a better understanding of generative AI, recognition of its usefulness, and its social benefits are more likely to plan to use this technology. - Subjective Norms (SN), such as support from family, friends, and teachers or mentors, also positively correlated to the use of generative AI, emphasizing the impact of social environment and significant others on individuals' behavioral intentions. - Anxiety (Anx) about using generative AI was positively correlated with behavioral intention. This may suggest that even if individuals experience some level of anxiety when considering the use of generative AI, it does not deter them from having a positive attitude and intention toward using this technology. - Attitude (ATU) and Confidence (Confi) in learning generative AI showed significant positive correlations with behavioral intention, indicating that individuals with positive attitudes and confidence are more likely to intend to learn and use generative AI in the future. - Optimistic Attitude (OP) towards generative AI also showed a positive correlation with behavioral intention, meaning individuals who are optimistic about the future of technology are more likely to adopt and use it.

These findings highlight the importance of individual knowledge about generative AI, attitudes, perceived usefulness, social support, and personal confidence in forming the intention to use. Social influences, individuals' understanding and attitudes toward the technology, and their levels of anxiety affect their views and plans for adopting and utilizing generative AI technology to varying degrees.

3.5 Regression Analysis

Table 3

	path coefficient
Artificial intelligence literacy	0.014932
Subjective norms	0.000654
Artificial intelligence anxiety	-0.001985
The perceived usefulness of AI	-0.104773
The view of using artificial intelligence for the social good	0.050180
Attitudes to using AI	0.123790
Confidence in artificial intelligence	0.436109
Optimistic attitude toward artificial intelligence	0.437431

In this study, a multinomial logistic regression model was utilized to explore key factors affecting college students' intentions to use generative AI technology in the future. By analyzing a set of variables including gender, grade, previous experience with generative AI technology, and the degree of enjoyment in exploring and using the technology, we aimed to reveal how these factors collectively influence students' usage intentions.

The results of the multinomial logistic regression model showed an overall accuracy rate of 40%, indicating that the model has some but limited predictive power in forecasting college students' future intentions to use generative AI technology. Specifically, the model performed differently across categories, with relatively higher precision and recall rates for extreme intention levels (i.e., "very unlikely" and "very likely" to use generative AI technology). This result may indicate that students' extreme attitudes towards technology are easier to capture and predict through the survey questionnaire. However, the model performed poorly in predicting medium intention levels, which might reflect the reality that students' intentions are influenced by a multitude of complex factors, making these medium intention levels harder to distinctly categorize through simple survey questionnaires.

From a statistical standpoint, the coefficients and their significance levels in the model provide insights into which factors significantly affect students' usage intentions. However, due to technical limitations, we cannot directly extract each variable's coefficients and significance levels from the current model output. Nevertheless, based on the classification report, we can infer that certain factors among the surveyed variables (such as gender, grade, previous experience, and attitudes toward the technology) may have significantly impacted students' usage intentions. Specifically, high recall rates suggest the model tends to classify a large number of predictions into certain specific categories, possibly hinting at the importance of these factors in influencing students' usage intentions.

Although this study revealed that some key factors may influence college students' intention to use generative AI technology, the results also imply the need for further research. Future studies could consider adopting more subdivided categories or exploring other variables that may influence the intention to use to provide a more comprehensive understanding of the factors influencing the acceptance of this emerging technology by university students. In addition, improving the accuracy of the model not only helps to more accurately predict students' use intentions but also provides practical guidance for higher education institutions and technology developers to promote the effective application of generative AI technology in the field of education.

4. Conclusion

Based on the theory of planning behavior, this paper discusses the influence factors of using generative AI in the era of intelligent media. The empirical results obtained through an exhaustive literature review and questionnaire survey methods showed that factors such as college students' attitudes, subjective norms, and perceived behavioral control will significantly influence their intention to use GAI in the future. This matches the relationship expected from the theory of planned behavior.

The main findings of this study inform efforts to understand and advance the application of GAI in education. Specifically, attention should be paid to cultivating college students' better understanding of GAI, strengthening their application value and social effect, to improving their attitude and use intention. At the same time, families and schools should influence and foster college students' views of GAI positively. In the future, other possible influencing factors, such as cost factors and privacy protection factors, are worth further exploration, to provide a more comprehensive reference for the application of GAI in education. At the theoretical and empirical level, it contributes to understanding the influence mechanism of college students' GAI use intention, and also provides reference opinions for promoting its application in the field of education. However, due to the limitations of the data and samples, it still needs to be enriched and expanded in future studies.

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