

A Study of Undergraduates' Behavioral Intention to Use Generative AI Tools—Ernie Bot as An Example

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Abstract. With the rapid advancement of artificial intelligence technology, its influence on various sectors is increasing. Ernie Bot, a leading tool in generative AI, has garnered significant attention and application. This study utilizes the Unified Theory of Acceptance and Use of Technology (UTAUT) and introduces the concepts of Perceived Risk and Information Quality to construct a model that examines the factors influencing undergraduates' behavioral intention to use generative AI tools like Ernie Bot. Using questionnaire data collected from 175 undergraduates, a structural equation model was employed to analyze the relationships between variables. The findings indicate that Social Influence, Information Quality, and Performance Expectancy positively impact the Behavioral Intention to use Ernie Bot. However, Effort Expectancy was not found to be a significant determinant of Behavioral Intention among undergraduates. Additionally, the study revealed that Perceived Risk did not negatively affect Behavioral Intention. These results offer valuable insights for the design and development of generative AI products, suggesting that enhancing Information Quality and leveraging Social Influence could improve user acceptance.

Keywords: GenAI; UTAUT; Behavioral Intention; Ernie Bot.

1. Introduction

In the wave of science and technology in the 21st century, Artificial Intelligence and AI technology have developed at an unprecedented speed, among which Generative AI (GenAI for short), as an important branch of the AI field, is gradually changing our way of work, study, and life. With its powerful content generation ability, GenAI can simulate the creative process of humans, from text and images to audio and video, and can do anything that greatly broadens the boundaries of information production. In this context, “Ernie Bot,” as the leader of GenAI tools, with its excellent language understanding and generation ability, has been widely considered and applied.

As the new force of society, undergraduates are not only the receivers of knowledge but also the explorers and promoters of new technology. In academic research, creative expression, daily learning, and other aspects, undergraduates have a high sensitivity and acceptance of new technologies. Therefore, understanding undergraduates' willingness and behavioral intention to use GenAI tools, especially specific products such as “Ernie Bot”, is of great significance for grasping future technological trends, optimizing product design, and improving user experience.

In terms of undergraduates' perceptions and attitudes towards GenAI, a study conducted by Chan & Hu in Hong Kong showed that undergraduates generally have a positive attitude towards GenAI tools such as ERNIE Bot, especially when it comes to personalized learning and research assistance. However, concerns have been raised about accuracy, privacy, and ethical implications [1]. Ruiz-Rojas et al. explored the impact of GenAI tools on critical thinking and collaboration among undergraduates and emphasized the importance of studying these technologies [2].

In terms of acceptance and use, Mowreader surveyed university professors and staff, as well as current students, on how they are using AI and found that a large percentage of university faculty are incorporating GenAI tools into their teaching practices, with three out of five students identifying themselves as regular users of AI [3].

As a GenAI product independently developed by Baidu, “Ernie Bot” has attracted wide attention since its release. Current studies on Ernie Bot mostly evaluate and analyze Ernie Bot's performance

from a technical perspective. For example, Dai Bifang and Chen Guiping discussed the possible problems in the dialogue with artificial intelligence and put forward some improvement strategies [4]. The application of ERNIE Bot in various industries, such as Chu Liankai & Zhang Feng, was also discussed. The application and development prospects of Ernie BOT in pharmaceutical care were discussed [5]. Su Liang discussed the application and attempt of the ERNIE Bot in the field of smart homes. It may also be due to copyright and institutional concerns [6].

However, there is relatively little literature on “Ernie Bot” from the perspective of undergraduates’ household behavior and willingness to use it. Few studies have explored its awareness, acceptance, and potential demand among undergraduates. This not only limits our understanding of undergraduates’ technology acceptance behavior, but also affects the effective promotion and application of GenAI tools in the field of higher education. Therefore, this study chooses “Ernie Bot” as an example to explore undergraduates’ willingness to use GenAI tools, which have certain innovative and practical significance.

This study focuses on “undergraduates’ behavioral intention to use GenAI tools” and takes “Ernie Bot” as an example for in-depth discussion. Through a questionnaire survey, data analysis, and other methods, this study aims to comprehensively understand undergraduates’ cognition status of GenAI and “Ernie Bot”, their intention to use it, and the influencing factors behind it by using the technology acceptance model and the existing problems of GenAI tools. Specifically, the research will focus on the following aspects: First, undergraduate students’ basic cognition and use of GenAI tool (Ernie Bot); The second is the undergraduates’ attitude towards GenAI tool (Ernie Bot) and their intention to use it.

2. Research Model and Hypothesis

The Unified Theory of Acceptance and Use of Technology, UTAUT proposed by Venkatesh et al. consists of Behavioural Intention, BI and Use Behavior, UB two result variables, Performance Expectancy, PE, Effort Expectancy, EE, Social Influence, SI and Facilitating Conditions, FC four core variables, it is also composed of four regulating variables: gender, age, experience, and voluntarily [7]. It has been found that this model can explain 70% of users’ technology acceptance, which is significantly higher than other theoretical models, so it is widely used in technology adoption and research [8]. Combined with the characteristics of the GenAI tool, this paper adds and modifies some variables on the basis of this model and builds the model framework, as shown in Figure 1.

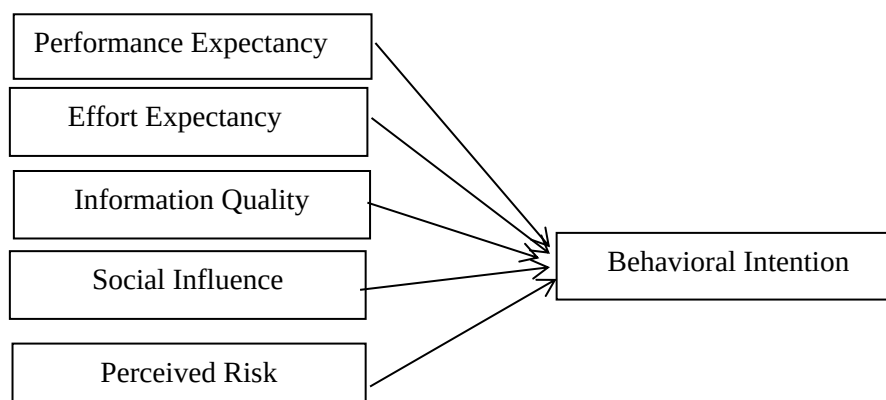


Fig. 1 GenAI acceptance model (Photo credit: Origin)

According to Table 1, the three variables of Performance Expectancy, Effort Expectancy, and Social Influence are retained. Performance Expectancy refers to the expected degree of undergraduates. Expectancy refers to the degree of expectation undergraduates have for using Ernie Bot and class generative artificial intelligence to meet their learning needs and improve their learning efficiency. Effort Expectancy means sensing how easy it is to use the product; Social Influence refers to the extent to which others have influence on the use of the product. In addition, combined with the characteristics of GenAI tools, the two variables of Perceived Risk (PR) and Information Quality (IQ)

are increased. Perceived risk refers to concerns about information leakage and failure to achieve expected goals that may occur during use [9]. Information Quality refers to the relevance, accuracy, and understandability of available online information related to products and services, as well as the degree to which online information meets customer needs [10]. At the same time, taking into account the network status of the surveyed area and the popularity of information terminals, the convenience factor is deleted. Based on the above model, the hypothesis shown in Table 1 is proposed.

Table 1. Research Hypothesis

	Hypothetical content
H1	The higher the performance expectation of Ernie Bot, the stronger the willingness to use Ernie Bot.
H2	undergraduates believed that the less effort required to use Ernie Bot, the more willing they were to use it.
H3	The more undergraduates are influenced by positive comments from those around them, the more likely they are to use Ernie Bot.
H4	undergraduates believe that the higher the quality of information provided by Ernie Bot, the more willing it is to use it.
H5	The lower the perceived risk of using Ernie Bot, the stronger the willingness of undergraduates to use Ernie Bot.

3. Method

This study firstly extracts the key factors affecting undergraduates' users' willingness to use the GenAI tool (Ernie Bot as an example) through an extensive literature review and a context-specific application of the Unified Theory of Acceptance and Use of Technology, UTAUT, including Performance Expectancy, Effort Expectancy, Social Influence Information Quality, Perceived Risk. Based on these factors, this study constructs a research model and proposes corresponding research hypotheses.

3.1. Questionnaire Design

The questionnaire design follows the principles of science and rigour and is divided into two parts: the first part collects the basic information of the respondents, including gender, grade, major, etc.; the second part is a survey on the respondents' usage habits; and the third part is based on the theoretical framework of the construction of the survey scale, which is in the form of a five-point Likert Scale (Likert Scale), to measure the undergraduates' expected performance on Ernie Bot Expectations, Effort Expectations, Social Influence, Information Quality, Perceived Risk, and Behavioral Intention. The questionnaire content was reviewed and pre-tested by experts to ensure that the questions were clearly formulated, free of ambiguity, and had good reliability and validity.

3.2. Data Collection

In this study, questionnaires were distributed to a university in Henan Province using the Chinese professional questionnaire survey platform "Questionnaire Star". The questionnaires were distributed online to ensure the coverage of undergraduates of different grades, majors, and genders. The questionnaires were collected from 9th to 11th July 2024, and a total of 185 online questionnaires were collected. After a rigorous screening process to exclude invalid responses that did not know or had not used the GenAI tool, 175 valid questionnaires were obtained, with a validity rate of 94%.

4. Result

4.1. Descriptive Statistics

The demographic statistical results of the surveyed objects are shown in Table 2.

Table 2. Descriptive statistics

Item	Options	Frequency	Percent
Gender	Male	48	27.4%
	Female	127	72.6%
Grade	Freshman	88	50.3%
	Sophomore year	19	10.9%
	Junior	56	32%
	Senior	12	6.9%
Major	Liberal arts	11	6.3%
	Science and engineering	10	5.7%
	Business	2	1.1%
	Art	152	86.9%

4.2. Reliability and Validity Analysis

The reliability of this study was first measured, and the results of the overall measurement of the 175 questionnaire scales using SPSS23.0 are shown in Table 3:

Table 3. Reliability Statistics

Cronbach's Alpha	N of Items
0.956	21

It can be seen from Table 3 that the overall Klonbach coefficient of the questionnaire reaches 0.956, which is greater than 0.9, indicating that the reliability quality of the research data is high. Secondly, the overall validity of the questionnaire was tested, as shown in Table 4:

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.923
Bartlett's Test of Sphericity	Approx. Chi-Square	3486.187
	df	210
	Sig.	0.000

Through analysis, it can be seen that the KMO measurement value of this study reached 0.923, which means that there is a strong correlation between variables. The P value of the Bartlett test is 0.000, which does not exceed 0.01, indicating that the significance test has been passed. Therefore, the questionnaire of this study has a good validity structure.

4.3. Correlation Analysis

In order to explore whether there is correlation between the respective variables and the Behavioral Intention of the dependent variable, Pearson correlation analysis is conducted, and it can be seen from the analysis of Performance Expectancy($r=0.561$, $p<0.01$), Effort Expectancy($r=0.582$, $p<0.01$), Social Influence($r=0.700$, $p<0.01$), Information Quality($r=0.666$, $p<0.01$), Perceived Risk($r=0.548$, $p<0.01$) is significantly positively correlated with Behavioral Intention. Since each variable is correlated with the dependent variable, the relationship between the independent variable and the dependent variable can be further verified.

4.4. Model Goodness-Of-Fit Testing

Model fitting degree test is mainly used to check whether the model is acceptable. Therefore, this study conducted a fitting degree test on the research model, and the results are shown in Table 5:

Table 5. Modified structural equation model fit

The goodness of fit indices	CMIN/DF	RMSEA	GFI	NFI	IFI	CFI	TLI
Recommended value	<3	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
RESULT	2.045	0.077	0.868	0.917	0.956	0.955	0.942

Through analysis, it can be seen that the Chi-square degree of freedom ratio of the model in this study is 2.045, which is less than 3, indicating that the model has a good fit and is generally reasonable, so the model in this study can be accepted.

4.5. Path Analysis And Hypothesis Testing Results

Path analysis is to study the influence relationship of the model, which is used to verify the hypothesis of the model. In order to test the influence relationship between the independent variable and the dependent variable, this study conducted path analysis through Amos26.0, and the analysis results are shown in Table 6:

Table 6. Path analysis results and hypothesis testing results

Hypothesis	Relationship	P	β	Testing results
H1: The higher the performance expectation of Ernie Bot, the stronger the willingness to use Ernie Bot.	EF→BI	0.044	0.18	Supported
H2: Undergraduates believed that the less effort required to use Ernie Bot, the more willing they were to use it.	EE→BI	0.312	-0.108	Not supported
H3: The more undergraduates are influenced by positive comments from those around them, the more likely they are to use Ernie Bot.	SI→BI	***	0.378	Supported
H4: Undergraduates believe that the higher the quality of information provided by Ernie Bot, the more willing it is to use it.	IQ→BI	***	0.272	Supported
H5: The lower the perceived risk of using Ernie Bot, the stronger the willingness of undergraduates to use Ernie Bot.	PR→BI	***	0.364	Not supported

Performance Expectation, Social Influence and Information Quality have significant positive effects on undergraduates' Behavioral Intention of using GenAI tools. Therefore, hypothesis H1, H3, and H4 are supported. However, Effort Expectation has no significant effect on Behavioral Intention, and Perceived Risk has no negative effect on Behavioral Intention, so H2 and H5 are not supported.

5. Discussion

Based on UTAUT theory, this study expands the model by adding Perceived Risk and Information Quality and designs the GenAI tool (Ernie Bot) behavioral intention model with undergraduates as the research object. Then, the maturity scale was selected to design a research questionnaire, and the validity of the theoretical model and the significance of the research hypothesis was verified by analyzing the data of influencing factors of GenAI tool (Ernie Bot) behavior intention. The results show that Performance Expectancy, Social Influence and Information Quality have significant positive effects on behavior intention to use, Effort Expectancy has no significant effect on the Behavior Intention, Perceived Risk did not have a negative effect on Behavioral Intention.

5.1. Performance Expectancy

Performance Expectancy is an important factor positively affecting the Behavioral Intention of undergraduates, which is consistent with Strzelecki's research conclusion on undergraduates' acceptance and use of chat GPT [11]. In the process of using GenAI tool (Ernie Bot), undergraduates found that the tool was more and more powerful in significantly improving learning efficiency, and then more willing to use GenAI tool (Ernie Bot) as a learning and life tool.

5.2. Effort Expectancy

Effort Expectancy has no significant effect on undergraduates' behavior intention to the GenAI tool (Ernie Bot) tool. Previous studies were also consistent with this conclusion [12]. This may be because different users have different technical abilities and willingness to learn. It may be relatively easy for technically competent users to master new tools, so striving to expect less impact on them. The respondents of this study are "Generation z", known as "Internet natives", who are deeply influenced by various technological products such as the Internet and instant messaging. Therefore, factors such as access to GenAI tools, and the difficulty of interface operation have no obvious impact on undergraduates.

5.3. Perceived Risk

Perceived Risk has a positive and significant impact on Behavioral Intention, which is in marked contrast with previous research conclusions [13]. The possible reasons are one. In this study, although the vast majority of respondents knew or used GenAI tools (94.6%), their usage was not high, with more than half of respondents saying they used them occasionally (55.4%) or rarely (18.9%). This is consistent with the findings in the "2024 Generation Z AIGC Attitude Report" released by Just So Soul Research Institute [14]. Therefore, although undergraduates perceive the existence of risk, they do not think it will affect them, nor will it become a barrier to continued use.

Second, among the objects of this survey, undergraduates majoring in art and design account for 87.01%. Due to the influence of individual differences, undergraduates of this kind usually have a strong spirit of innovation and a desire to explore and are more open to the acceptance of new technologies. As a result, they are likely to see the use of emerging tools such as Ernie Bot as a trend-setting innovation, taking the initiative despite perceived risks, and seeing it as a way to show individuality and a forward-looking perspective.

5.4. Information Quality

Information Quality has a positive and significant effect on behavioural intention, which is in line with the findings of Aryani et al. on the factors influencing consumers' behavioural intention to use takeaway apps [15]. When the GenAI tool (Ernie Bot) interacts with undergraduates in natural language, the higher the quality of feedback information (including timeliness, accuracy, comprehensiveness, etc.), the stronger the behavioral intention of undergraduates.

5.5. Social Influence

The positive influence of Social Influence on undergraduates' intention to use is relatively high. This conclusion is consistent with the results of Tan et al.'s study on undergraduates' willingness to use ChatGPT [16]. The influence of Social Influence on undergraduates' usage behavior intention mainly comes from the atmosphere of social public opinion, herd psychology and group pressure. In other words, the more the surrounding students, teachers, and social atmosphere agree with the use of generative artificial intelligence tools, the more undergraduates will increase their intention to use them. The impact is particularly significant for contemporary undergraduates who are keeping up with the times and exploring new knowledge.

5.6. Suggestion

Increasing user acceptance of GenAI tools requires efforts to improve performance expectations, social impact, and Information Quality. First of all, the application scenarios should be expanded to meet more needs and comprehensively improve the performance expectations of users. Second, generative AI should be promoted widely, and its influence expanded. Finally, data management and analysis should be strengthened to ensure the accuracy, timeliness, and comprehensiveness of the generated content so as to improve the Information Quality and thus improve the user experience.

In addition, while undergraduates are fully aware of the cyber risks associated with using generative AI tools, this has not deterred them from continuing to adopt such technologies. In view of the increasingly complex and changeable network environment, the state should still formulate and improve relevant laws and regulations to draw red lines and indicate the bottom line for the development and application of generative AI to prevent its harm. At the same time, a series of cyber security education and training activities should be carried out in colleges and universities to provide strong support for undergraduates to enhance their digital literacy and security awareness.

6. Conclusion

6.1. Key Findings

Based on UTAUT theory, this study expands the model by adding Perceived Risk and Information Quality to explore undergraduates' acceptance of the GenAI tool (Ernie Bot) and its influencing factors. It is verified that Performance Expectancy, Social Influence, Information Quality, and Perceived Risk have significant positive effects on intention to use. Effort Expectancy has no significant effect on usage intention.

6.2. Research Significance

This study enriches the theoretical perspective of the UTAUT model and its application in the study of GenAI tool usage intention. At the practical level, through empirical research, the paper reveals the specific needs and preferences of undergraduates, especially those majoring in art and design, for generative AI tools and provides suggestions based on the results. Provides valuable user feedback and data support for developers of ERNIE Bot and similar products. It is conducive to product developers accurately positioning product functions according to user feedback, constantly upgrading product performance, and improving user experience so as to maintain a leading position in the fierce market competition.

6.3. Limitations and Future Study

The limitations of this paper are as follows: First, the total sample size is small, and the specialty distribution is uneven, which has a certain typicality. Future studies can expand the sample size to enhance the study's representativeness and generality. Second, the data in this study came from the results of a questionnaire survey. In the future, the relationship between undergraduates and the willingness to use GenAI tools can be further studied by combining qualitative research methods.

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