

How AI Literacy Affects the Intention to Use AIGC: An Empirical TAM-Based Study

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Abstract: In the contemporary digital and intelligent society, the accelerated evolution of Artificial Intelligence-Generated Content (AIGC) technology is profoundly transforming a multitude of industries. Nevertheless, there is a notable discrepancy between the public's awareness and acceptance of AIGC, which is largely contingent upon individual AI literacy. This study, which is based on the Technology Acceptance Model (TAM), explores the impact of AI literacy on the intention to use AIGC, with a particular focus on the mediating roles of Perceived Usefulness and Perceived Ease of Use. The results of the regression analysis and structural equation modelling (SEM), based on 630 valid questionnaires, demonstrate that AI literacy has a significant positive influence on Perceived Usefulness and Perceived Ease of Use, which in turn have a positive impact on wanting to use AIGC. Perceived Usefulness and Perceived Ease of Use act as partial mediators between AI literacy and intention to use AIGC. This work provides theoretical support for the widespread adoption of AIGC and offers practical guidance for businesses and policymakers to improve public AI literacy.

Keywords: AI Literacy; Artificial Intelligence Generated Content; AIGC; TAM

1. Introduction

In the digital era, the rise of AIGC is profoundly reshaping various industries. Based on machine learning and deep learning technologies, AIGC can automatically generate text, images, audio, and video content, and is widely applied in fields such as advertising, creative design, education, and journalism (Liu & Chen, 2024)[1]. Tools like ChatGPT and DALL·E have greatly improved content production efficiency and

introduced a new creative experience. However, there are significant global disparities in the public's awareness and acceptance of AIGC (Zhang et al., 2024)[2]. One important reason for this lies in individual AI literacy, which not only includes an understanding of the but also encompasses operational and adaptive skills. Research has shown that digital literacy is a crucial factor affecting individuals' ability to adapt to emerging technologies, and further influences their intention to use the technology (Arias López et al., 2023)[3]. Therefore, AI literacy has become a key determinant of whether users accept AIGC (Chen & Bai, 2023)[4]. This work, based on the TAM, explores how AI literacy influences the public's intention to use AIGC through how useful and easy the tool is to use.

2. Theoretical Analysis and Hypotheses Development

2.1 AI Literacy and Digital Technology Adoption Intention

AI literacy refers to the ability of a person to understand, manipulate and apply AI technology.. In recent years, AI literacy is a key factor in how people accept new technology (Chen & Bai, 2023)[5]. As AIGC is promoted, AI literacy affects the public's ability to adopt the technology and cope with its complexity. (Vallès-Peris & Pareto, 2024)[6]. Safinah Ali et al. (2019) pointed out that people with high AI literacy understand complex technology better and are more positive about using it. Zhou et al. (2024) also confirmed that improving AI literacy can significantly increase certain groups' (e.g., students) intention to use the technology[7]. Given the evidence, let us hypothesise as follows:

H1: AI literacy and the propensity to use AIGC technology are positively correlated.

2.2 The Role of Perceived Usefulness and Perceived Ease of Use in Technology Adoption

To further investigate the impact of AI literacy on the public's perception of technology, TAM provides an effective theoretical framework. It is used to explain why people use technology. Davis (1989) says that the most important factors in determining whether people accept a technology are how useful they find it and how easy it is to use. Perceived Usefulness (PU) is about whether a technology can help you work better or improve your quality of life. Perceived Ease of Use (PEOU) is about whether it is easy to learn and use (Venkatesh & Bala, 2008).

Users with higher AI literacy tend to better understand the working principles of AIGC and perceive it as both easy to use and helpful in improving work efficiency (Mortensen, 2024) [8]. Cheng et al. (2021) found that users with higher AI literacy are more capable of effectively applying AIGC and show higher PU and PEOU in their professional fields. Zhu and Wang (2023) pointed out that combining technical understanding with practical application scenarios is key to improving PU and PEOU. Given the evidence, let us hypothesise as follows:

H2: There will be a positive correlation between AI literacy and the Perceived Usefulness of AIGC technology.

H3: There will be a positive correlation between AI literacy and the Perceived Ease of Use of AIGC technology.

2.3 Link between Perceived Usefulness, Ease of Use and Intention

TAM has demonstrated strong predictive power in explaining users' technology adoption behavior. The core mechanism of this model is based on the interaction between users' perceptions of technology and their behavioral intentions. TAM (Davis, 1989) has studied how PU and PEOU affect technology adoption. Behavioural Intention (BI) refers to users' plans to use a new technology, which is directly influenced by their perceptions of the technology's usefulness and ease of use. These two factors affect how users see the cost of using the technology (Venkatesh & Davis, 2000).

Gao et al. (2024) found that when users see tech as improving efficiency or simplifying processes, they're more willing to use it. Similarly, Zhang et al. (2023) pointed out that higher PEOU

reduces users' psychological barriers when operating the technology, thereby increasing their likelihood of using it. Given the evidence, let us hypothesise as follows:

H4: Perceived usefulness will have a positive effect on AIGC usage intention.

H5: Perceived Ease of Use will have a positive effect on AIGC usage intention.

2.4 The Intermediaries between AI Literacy and Intention

AI literacy affects how people see AIGC and whether they use it. Users with more AI knowledge can see the value of AIGC. They think AIGC is more useful in their specific areas. (Zhu & Wang, 2023) [9]. Long and Magerko (2020) say that if people find a technology easy to learn and use, they are more able to use it. AI literacy helps people accept new technology in education and healthcare. AI literacy helps professionals in sectors like marketing and creative industries use AIGC tools well. Vassileva et al [10]. (2021) found that more AI literacy leads to more confidence in using AI tools. In industries like finance or e-commerce, users with higher AI literacy can use AI solutions more easily. This means they are more likely to see AI as useful and easy to use. This is backed up by research by Davis et al. (1989).

Given the evidence, we propose the following hypothesis: **H6: Perceived Usefulness will mediate the link between AI literacy and AIGC usage intention.**

H7: Perceived Ease of Use will mediate the link between AI literacy and AIGC usage intention.

The conceptual model used in this study is shown in Figure 1.

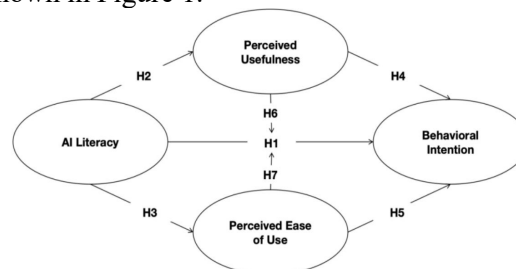


Figure 1. Conceptual Model

2.5 Theoretical Contributions and Research Gaps

While research has looked at how AI literacy, PU, and PEOU affect technology adoption, research on how these factors influence the likelihood of using AIGC is still lacking. Also, most studies focus on specific groups, not the

whole picture. This study aims to fill this research hole by studying how AI literacy affects the public's intention to use AIGC. This research aims to provide new evidence for TAM and guide companies and policy makers in promoting technology adoption.

3. Methodology

3.1 Design

This study uses a questionnaire to explore how AI literacy, perceptions of usefulness, and perceptions of user convenience influence the willingness to use AIGC. The questionnaire is based on TAM and includes four variables. AI literacy, Perceived Usefulness, Perceived Ease of Use and Behavioral Intention to use AIGC. All questions use a five-point scale from Likert. The scales were adapted from existing studies and reviewed by experts to ensure they were valid.

3.2 Data Collection

Before officially distributing the questionnaire, a small pilot study was run with a sample of 60 respondents to assess the clarity and consistency of the instrument. According to the feedback, some wording was adjusted. The revised questionnaire was distributed through the *Questionnaire Star* platform using a snowball sampling method, targeting individuals with different occupations and educational backgrounds. Data collection took place in September 2024, resulting in a total of 655 responses. After data cleaning, 630 valid responses were retained, excluding invalid responses such as those with obvious response patterns or extremely short completion times.

3.3 Measurement of Variables

For AI literacy, based on scales from existing literature, it was measured using a scale to assess individuals' knowledge and ability to understand, operate, and apply AI technologies.

For PU, as defined by Davis (1989), it was measured to assess whether users believe that AIGC can improve work or life efficiency.

For PEOU, as defined by Davis (1989), it was measured to assess whether users find AIGC easy to learn and operate.

For BI, as defined by Davis (1989), it was measured to evaluate the public's intention to use AIGC in the future.

3.4 Ethical Considerations

This study followed ethical guidelines. All participants gave their consent and their privacy and data were protected. All data were anonymous and used for academic research.

4. Methodology

4.1 Basic Statistical Information

A descriptive statistical analysis was carried out to evaluate the demographic characteristics of the sample, including gender, age and education, with a view to identifying any differences in AI literacy and intention among different groups. The details of this analysis are presented in Figure 2. 630 valid responses were collected, with 41.7% males (263) and 58.3% females (367). 69.8% of respondents were between 18 and 25, 12.7% were aged 26-30, with other age groups making up the rest. The respondents had high educational levels: 74.4% held a bachelor's degree, and 14% held a master's. This indicates a high level of education. The sample is representative and provides a basis for analysis. This study will examine differences in AI literacy and intention to use among different demographic groups.

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	263	41.7	41.7	41.7
	Female	367	58.3	58.3	100.0
	Total	630	100.0	100.0	
Age	Under 18	16	2.5	2.5	2.5
	18-25	440	69.8	69.8	72.4
	26-30	80	12.7	12.7	85.1
	31-40	69	11.0	11.0	96.0
	41-50	17	2.7	2.7	98.7
	51-60	6	1.0	1.0	99.7
	Above 60	2	0.3	0.3	100.0
	Total	630	100.0	100.0	
Education	High school or below	21	3.3	3.3	3.3
	Associate Degree	38	6.0	6.0	9.4
	Bachelor's Degree	469	74.4	74.4	83.8
	Master's Degree	88	14.0	14.0	97.8
	PhD or above	14	2.2	2.2	100.0
	Total	630	100.0	100.0	

Figure 2. The Demographic Characteristics

4.2 Reliability and Validity Analysis

A reliability analysis was conducted on the four fundamental variables to guarantee data dependability and accuracy. Cronbach's α assessed the internal consistency of each variable's scale. Results with Cronbach's α values above the commonly accepted threshold of 0.7, indicating excellent internal consistency across all scales used in the study.(Figure 3).

	Cronbach's α	Mean	SD
AI Literacy	0.869	3.48	0.93
PU	0.918	3.92	0.96
PEOU	0.853	3.66	0.90
BI	0.865	3.75	0.91

Figure 3. Reliability Analysis

An exploratory factor analysis (EFA) was conducted to assess construct validity. The KMO measure of sampling adequacy was 0.79, indicating that the sample was adequate for factor analysis. Bartlett's test of sphericity was highly significant ($p < 0.001$), indicating that the data were suitable for identifying underlying factor structures.

The factor analysis extracted a single principal component which explained 76.404% of the total variance. This high percentage suggests that a substantial amount of variance across the variables is captured by this single factor, supporting the unidimensionality of the constructs. In addition, the communalities of the variables were 0.703 for AI literacy, 0.756 for PU, 0.804 for PEOU and 0.793 for BI, further confirming that the constructs are well explained by the factor model.

These results demonstrate that the measurement model used in this study is both reliable and valid, providing a strong basis for further analysis.

4.3 Assessment of Relevance

Next, Pearson correlation coefficients were obtained to examine the associations between the variables (see Figure 4). The results showed that all core variables were significantly correlated ($p < 0.001$), supporting the hypotheses:

AI literacy is moderately related to PU ($r = 0.566$).

AI literacy is moderately related to PEOU ($r = 0.702$).

The correlation between PU and BI was 0.738, showing that PU has a strong positive effect on using intention.

The correlation between PEOU and BI was 0.694, showing a strong positive relationship.

These results show that AI literacy affects how useful people think and how easy it is to use. This in turn affects how willing people are to use AIGC.

		AI Literacy	PU	PEOU	BI
AI Literacy	Pearson Correlation	1			
	Pearson Correlation	.566**	1		
	Sig. (2-tailed)	<.001			
PU	N	630	630		
	Pearson Correlation	.702**	.732**	1	
	Sig. (2-tailed)	<.001	<.001		
PEOU	N	630	630	630	
	Pearson Correlation	.677**	.738**	.694**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
BI	N	630	630	630	630

** Correlation is significant at the 0.01 level (2-tailed).

Figure 4. Correlation Analysis

4.4 SEM Analyses

To validate the hypotheses and explore the roles of PU and PEOU between AI literacy and BI, a structural equation model was constructed. The model fit index indicates an adequate fit to the data ($\chi^2/df = 2.045$, CFI = 0.961, TLI = 0.955, RMSEA = 0.042), suggesting that the model adequately explains the relationships between the variables.

The details of the SEM analysis are as follows:

AI literacy has a positive effect on PU ($\beta = 0.5809$, $p < 0.001$) and PEOU ($\beta = 0.6776$, $p < 0.001$), supporting H2 & H3.

PU has a positive effect on BI ($\beta = 0.4369$, $p < 0.001$), which confirms H4.

PEOU also has a great influence on BI ($\beta = 0.1284$, $p < 0.01$), which supports H5.

Additionally, AI literacy indirectly influences BI through both PU and PEOU, confirming the mediating roles of these constructs and supporting H6 and H7.

These findings suggest that AI literacy not only directly influences users' intention to adopt AIGC, but also indirectly enhances this intention through users' perceived usefulness and usability.

4.5 Mediation Effect Analysis

To further explore the mediation effects, the bias-corrected Bootstrap method (with 5,000 resamples) was used to test the indirect effects of PU and PEOU. The details showed:

The indirect effect of AI literacy on BI through PU was significant (coeff = 0.2538, $p < 0.001$), supporting H6.

The indirect effect of AI literacy on BI through PEOU was also significant (coeff = 0.0870, $p < 0.01$), supporting H7.

These results confirm that AI literacy has a direct impact on usage intention, as well as enhancing it through increased perceived usefulness and convenience (as shown in Figure 5, ***: $p < 0.001$, **: $p < 0.01$, *: $p < 0.05$).

These results confirm that AI literacy has a direct positive influence on BI. In addition, AI literacy reinforces this effect indirectly through its effect on PU and PEOU. Thus, PU and PEOU act as important mediators in the relationship between AI literacy and BI, as shown in Figure 5 (*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ ***).

4.6 Recap of Model Testing

Through SEM and mediation analysis, the mechanism by which AI literacy influences the public's likelihood of using AIGC has been

validated. All model fit indices reached ideal levels, implying that the theoretical model provides a good explanation of the link between AI literacy and intention to use advanced technology. The results of the model provide theoretical support for enhancing public AI literacy and optimizing strategies for promoting AIGC.

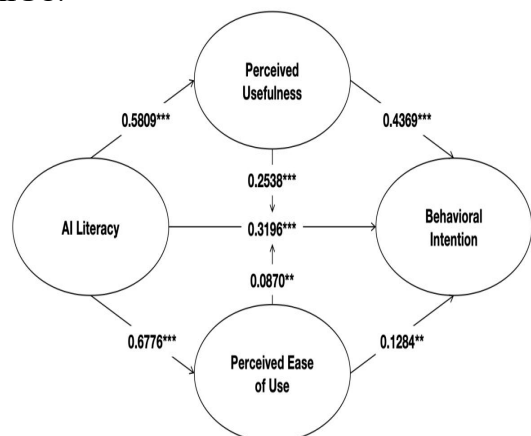


Figure 5. Path Analysis

5. Discussion

5.1 Academic Aspects

This research, based on the Technology Acceptance Model, examines the influence of AI literacy on the AIGC intention. It identifies the significant mediating roles of PU and PEOU. The findings make a number of significant theoretical contributions to the existing literature. First, this study confirms the key of AI literacy in predicting technology adoption. The findings align with prior research indicating that AI literacy influences users' willingness to adopt new technologies and acceptance of AIGC. This extends the application scenarios of TAM and provides new theoretical insights.

Second, this study contributes to the growing volume of literature on the role of PU and PEOU in TAM. Although previous research has examined these variables, this study demonstrates that users with higher levels of AI literacy are more frequently used in AIGC. This is especially important with complex AI technologies.

Finally, the mediation effects of PU and PEOU offer new insights into users' intention to adopt AIGC. Unlike traditional technologies, AIGC technologies require more cognitive and operational capability. PU and PEOU reduce the psychological burden, enhancing users' intention to utilise them (Venkatesh & Bala, 2008).

5.2 Operational Aspects

There are a number of practical implications from this study. First, the results show that improving public AI literacy is an effective strategy for promoting the widespread adoption of AIGC technology. Educational institutions and technology developers can enhance users' understanding and operational ability through training and knowledge dissemination, thereby increasing their acceptance of emerging technologies. This is in accordance with the work done by Arias López et al. (2023), who highlight the strong correlation between digital literacy and technology adoption.

Second, the importance of PU and PEOU for increasing technological adoption highlights the need for developers to focus on optimizing user experience. For AIGC technologies, developers should design simple and intuitive user interfaces and demonstrate the practical value of the technology through real-world applications, thereby enhancing users' PU. Companies can further improve product design and functionality to enhance PEOU, reducing barriers to use of technology and increasing market competitiveness.

Furthermore, when promoting AIGC, businesses should prove the benefit and user-friendliness of the technology in practical applications to attract potential users. For complex AI products, simplifying the user experience and providing clear operational guidance can help reduce learning costs and increase users' intention to adopt the technology.

5.3 Research Limitations and Directions

While this paper provides fresh insights into the connection between AI literacy and intending to use AIGC, it is not without limitations. Firstly, the sample data is primarily drawn from specific social groups (e.g. highly educated individuals), which may restrict the generalisability of the results. That could be widened to include a wider range of social groups through further research, thus providing greater assurance as to the impact of AI literacy across different populations.

Secondly, this study employed cross-sectional data, which precludes the capture of dynamic changes in AI literacy over time. Future research may wish to adopt longitudinal designs to track the impact of AI literacy on propensity to use over time, thereby revealing long-term changes

in this relationship.

6. Conclusions

To sum up, this paper empirically examined the roles of AI literacy, Perceived Usefulness, and Perceived Usability on the AIGC intention. The findings not only enhance the theoretical framework of TAM but also offer significant practical implications for the advancement of public AI literacy and the optimisation of technology promotion strategies. Further research could extend the scope of this study, thereby facilitating the wider adoption and utilisation of AI technologies.

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