ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/383041763

Examining the effects of ChatGPT on tourism and hospitality student responses through integrating technology acceptance model

Article *in* International Journal of Tourism Research · August 2024

DOI: 10.1002/jtr.2727

CITATIONS
8

READS
592

5 authors, including:

Chris Zhen Gan Zhu
Shanghai Normal University
29 PUBLICATIONS **570** CITATIONS
SEE PROFILE

Colin Michael Hall
University of Canterbury
1,029 PUBLICATIONS **67,527** CITATIONS
SEE PROFILE

Lawrence Hoc Nang Fong
The Hong Kong Polytechnic University
98 PUBLICATIONS **2,447** CITATIONS
SEE PROFILE

Sara Naderi Koupaei
University of Canterbury
17 PUBLICATIONS **272** CITATIONS
SEE PROFILE

All content following this page was uploaded by Chris Zhen Gan Zhu on 13 August 2024.

The user has requested enhancement of the downloaded file.

Check for updates

Received: 29 November 2023 | Revised: 14 July 2024 | Accepted: 20 July 2024

DOI: 10.1002/jtr.2727

RESEARCH ARTICLE

WILEY

Examining the effects of ChatGPT on tourism and hospitality student responses through integrating technology acceptance model

Chris Zhen Gan Zhu[1,2] | C. Michael Hall[3,4,5,6,7] | Lawrence Hoc Nang Fong[8] | Feifei Lin[9] | Sara Naderi Koupaei[3]

[1]Shanghai Institute of Tourism, Shanghai Normal University, Shanghai, China

[2]Faculty of Creative Tourism and Intelligent Technologies, Macao University of Tourism, Macau SAR, China

[3]Department of Management, Marketing and Tourism, University of Canterbury, Christchurch, New Zealand

[4]Geography Research Unit, University of Oulu, Oulu, Finland

[5]School of Business and Economics, Linnaeus University, Kalmar, Sweden

[6]Department of Service Management and Service Studies, Lund University, Helsingborg, Sweden

[7]School of Hospitality, Tourism and Events and Centre for Research and Innovation in Tourism (CRiT), Taylor's University, Subang Jaya, Malaysia

[8]Faculty of Business Administration and Centre for Cognitive and Brain Sciences, University of Macau, Macau SAR, China

[9]School of Housing, Building and Planning (HBP), Universiti Sains Malaysia, Malaysia

Correspondence
Feifei Lin, School of Housing, Building and Planning (HBP), Universiti Sains Malaysia, Malaysia.
Email: calin2020@126.com

Abstract

ChatGPT has gained increased attention as an artificial intelligence (AI)-based tool in the field of tourism and hospitality education in recent years. This study investigates the impact of perceived ease of use, perceived usefulness and authenticity on student attitude and intention to use ChatGPT by incorporating the concept of authenticity into the technology acceptance model (TAM) theoretical framework in tourism and hospitality education. This study found that authenticity had the strongest indirect effect on student intention to use ChatGPT compared with perceived ease of use and perceived usefulness. This study broadens the applicability of TAM theory in ChatGPT and provides practical insights into its application.

KEYWORDS
authenticity, ChatGPT, education, TAM theory, tourism and hospitality

1 | INTRODUCTION

ChatGPT is a product of artificial intelligence (AI), and its emergence not only promotes the development of AI technology but also changes the learning and lives of users through its generation of information and knowledge (Fui-Hoon Nah et al., 2023; Yu, 2023). ChatGPT can be a valuable tool that helps users deal with tasks and provides services. For example, ChatGPT can assist users in making restaurant reservations or searching for information (Bang et al., 2023). In addition, ChatGPT is used as a study tool that provides students with personalized learning advice, solves their educational difficulties and/or facilitates learning of languages (Qadir, 2023). However, to the best knowledge of us, little is known about the attitudes and intention to use ChatGPT by hospitality and tourism students.

Previous studies related to user responses to ChatGPT have focused on antecedents including effort expectancy (Duong, 2024; Ma & Huo, 2023), social influence (Albayati, 2024; Duong, 2024), facilitating conditions (Duong, 2024), performance (Ma & Huo, 2023), knowledge application (Jo, 2023), perceived intelligence (Jo, 2023), usability (Jo, 2023) and trust (Albayati, 2024). Among the factors,

 © 2024 John Wiley & Sons Ltd.

perceived ease of use and usefulness of ChatGPT as reliable predicts remain controversial. Saif et al. (2024) found out that only perceived ease of use for ChatGPT can increase students' attitude in learning management but not usefulness. On the other hand, researchers have noted that both perceived ease of use and perceived usefulness improve students' attitude (Tiwari et al., 2023). In addition, ChatGPT has accuracy issues because it can generate generic and repetitive results (Fui-Hoon Nah et al., 2023) and inaccurate information (Keshavarz et al., 2024). Thus, the authentic experience of using ChatGPT possibly impacts user attitude and use intentions for ChatGPT. To the best of our knowledge, no empirical studies have elaborated on the impact of perceived ease of use, perceived usefulness and authenticity on student attitudes, and intention to use ChatGPT in tourism and hospitality education.

To address the research gaps above, this study aims to integrate authenticity into the technology acceptance model (TAM) theoretical model and further investigate the impact of perceived ease of use, perceived usefulness and authenticity on student responses (attitude and behaviour intention) to ChatGPT. This study makes several contributions to knowledge. To begin with, this study used a quantitative approach to explore the TAM theory with the integration of authenticity in ChatGPT. Furthermore, this study helps ChatGPT administrators understand the prospects of improving the application of ChatGPT in learning and education.

2 | LITERATURE REVIEW

2.1 | ChatGPT and authenticity

The application of ChatGPT is creating huge changes in tourism and hospitality education given that ChatGPT is an easily accessible tool for users (Ivanov & Soliman, 2023). For teachers, ChatGPT can be used to grade student essays, which helps teachers spend more time on other tasks. For students, ChatGPT also helps build adaptive learning systems for individual students, so that teaching methods can be updated and personalized according to student progress and performance (Baidoo-Anu & Owusu Ansah, 2023). However, ChatGPT also has some disadvantages. First, ChatGPT is lacking original reference sources for the texts with the answers it generates (Pantanowitz & Pantanowitz, 2023). Second, ChatGPT may provide conflicting answers sometimes if users' questions are complex and difficult to understand (Panda & Kaur, 2023). Finally, the accuracy of results is influenced by the comprehensiveness and relevance of ChatGPT training data (Panda & Kaur, 2023). Thus, given its relative advantages and disadvantages and increasing use, it is very important to investigate student responses to ChatGPT.

ChatGPT is believed to have the ability to complement and increase users' creativity in a virtual network (Zhou, 2023). However, as mentioned above, ChatGPT also has authenticity and accuracy issues as ChatGPT can generate generic and repetitive results (Fui-Hoon Nah et al., 2023), and inaccurate information (Keshavarz et al., 2024). Authenticity plays an important role in shaping users' perception of technology (Vo et al., 2024) and intention to use the technology (Kim et al., 2020a, 2020b). Studies on the effects of authentic experiences have been emphasized in tourism research (Chen et al., 2022; Coşkun, 2021). Previous studies noted the importance of authenticity of AI technology in users' co-creation of value and increased loyalty to technology (Pandey & Rai, 2024; Vo et al., 2024). Šlapeta (2023) claimed that ChatGPT cannot provide authentic experiences during use, but this suggestion lacks empirical support. Therefore, there is a need for empirical research on perceptions of authenticity in ChatGPT.

2.2 | Theoretical foundation

The TAM was created by Davis (1989) in social psychology to measure users' willingness to utilise a new technology. Users employ the new technology when it helps them achieve their goals and needs; otherwise, they will give up using the new technology (Copeland et al., 2023). The TAM model included four constructs: perceived usefulness, perceived ease of use, attitude and behaviour intention (Davis, 1989; Koutromanos et al., 2024; Liesa-Orús et al., 2023; Liu & Ma, 2024; Papakostas et al., 2023).

Perceived usefulness is the extent to which individuals perceive that using the new technology is helpful in finishing tasks, while perceived ease of use is the extent to which individuals perceive that using the new technology will save physical and mental energy (Copeland et al., 2023). Behavioural intention is impacted by users' attitudes toward new technology and its perceived usefulness. Individuals' attitudes are impacted by perceived usefulness and perceived ease of use (Alateeg & Alhammadi, 2023; Arachchi & Samarasinghe, 2024; Hua & Wang, 2019; Sinha & Bag, 2023), while other external variables can also impact attitudes toward new technology based on TAM (Hua & Wang, 2019), such as hedonic motivation (Shen et al., 2022), perceived enjoyment (Arachchi & Samarasinghe, 2024), perceived cost (Alateeg & Alhammadi, 2023), technological barriers (Alateeg & Alhammadi, 2023); subjective norm (Alshurafat et al., 2021), and perceived trust (Himel et al., 2021). Perceived usefulness and perceived ease of use are particularly important in explaining behavioural intention to use new technologies (Copeland et al., 2023; Shen et al., 2022).

TAM has been widely accepted and applied in studies related to the application of technology (Alassafi, 2022). According to the model, perceived usefulness and perceived ease of use are important constructs to understand users' responses to technology (Castiblanco Jimenez et al., 2020). The TAM model has been recognised for its capacity in explaining intention to use technology because of the strong empirical support the model has received (Shen et al., 2022). Therefore, the TAM model is operationally attractive, since it was created based on a solid theoretical foundation (reasoned action theory and planned behaviour theory), with many measurement scales applied in different industries (Suhartanto et al., 2020). Although some scholars (e.g., Blut et al., 2022) have used UTAUT theory to explain and predict users' intentions for technologies, the TAM model is more

15221970, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jtr.2727 by Cochrane Macao, Wiley Online Library on [12/08/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

widely applied (Alassafi, 2022). Therefore, given its application to different technologies and its capacity to predict users' usage intentions, this study selects TAM as a theoretical framework to explore behavioural intentions towards ChatGPT.

It has been suggested that TAM is too general and limited in predicting users' intentions for some specific technologies (Shen et al., 2022; Ukpabi & Karjaluoto, 2017). However, in tourism and hospitality education research, TAM has been updated by adding other important elements and increasing the explanatory capacity of usage intention for technological systems (Yung & Khoo-Lattimore, 2019). More external factors have been added to extend the TAM model to explain the usage intention of technology and investigate the relationship among variables, such as perceived trust (Muflih, 2023), perceived behavioural control (Bano & Siddiqui, 2022), subjective norm (Castiblanco Jimenez et al., 2020), computer self-efficacy (Castiblanco Jimenez et al., 2020) and cognitive and emotional engagement (Gao et al., 2020). Empirical studies have also confirmed that the TAM model has high capability and can successfully integrate other variables. Alassafi (2022) added information quality, technological fit, self-efficacy, knowledge quality, social influence and academic motivation to the TAM model to study their effects on usage intention. Mailizar et al. (2021) also focused on E-learning systems and added experience to the TAM model. Both attitude and E-learning experience were found to be the most important variables for increasing usage intention, but the effects of perceived usefulness and perceived ease on usage intention were not significant.

Previous studies (Carlos Roca et al., 2009; Lai, 2017) stated that attitude should be omitted from TAM because perceived usefulness and perceived ease of use have more significant impacts on behavioural intention towards new technology since attitude cannot significantly impact behavioural intention. Attitudes have been shown to have a weak mediating function for the constructs of TAM and behavioural intention (Lai, 2017). Nevertheless, attitudes toward using ChatGPT are complex. It is possible, for instance, teachers focus more on cheating and plagiarism (Khalaf, 2024), while students use ChatGPT for writing assessments and learning language (Barrot, 2023). Therefore, different purposes of use and population samples may result in different findings. Students' attitude for AI technology, can impact students' usage willingness and intention (Gado et al., 2022). Positive attitude stimulates users to explore and use the new technology, while negative attitude results into resist usage AI technology (Acosta-Enriquez et al., 2024). However, ChatGPT also has authenticity issues because of the likelihood of repetitive results, plagiarism and lack of critical thinking and synthesis that may create negative attitudes among users (Khalaf, 2024). Thus, attitude is needed to focus on students' perspectives.

Overall, the TAM model has been regarded as a suitable theoretical model for exploring the intention of technology. In the context of tourism and hospitality education, the TAM model can therefore be used to potentially enhance the use intention of new technology (Shen et al., 2022). Then, the TAM model can also be extended by incorporating authentic experiences as the mechanism that shapes attitude, which may impact the intention to use ChatGPT.

2.3 | Hypothesis development

2.3.1 | Perceived usefulness, perceived ease of use and attitude

According to TAM, perceived usefulness and perceived ease of use can positively impact attitude, while attitude and perceived usefulness can positively impact behavioural intention (Hua & Wang, 2019). In the study of Bano and Siddiqui (2022), all relationships in TAM were confirmed in the use of smart technologies. However, the relationship has not been confirmed when scholars only focused on a single smart technology. Khalil et al. (2023) revealed that there was no positive effect of perceived ease of use on attitude towards augmented reality (AR) in museums, with the same conclusions also drawn by Shen et al. (2022) in the usage intention of AR and VR in tourism. Therefore, different results may also emerge in the TAM model when the study only focuses on the intention to adopt ChatGPT. Thus, the following hypotheses were developed:

Hypothesis 1. Students' perceived usefulness positively affects their attitudes toward ChatGPT.

Hypothesis 2. Students' perceived ease of use positively affects their attitudes toward ChatGPT.

Hypothesis 3. Students' attitudes positively affect their intentions to use ChatGPT.

2.3.2 | Authentic experience and attitude

There is argument over whether ChatGPT can provide authentic experiences during use (Elkhatat, 2023; Vaccino-Salvadore, 2023). However, in related studies of immersive technology, Kim et al. (2020b) revealed that authentic experience can positively impact cognitive and affective responses, which means authentic experience may result in tourists' cognitive and affective evaluations, such as attitude. In immersive technology studies, scholars have similarly found that authenticity can influence tourists' attitude (Zhu, Hall, et al., 2023).

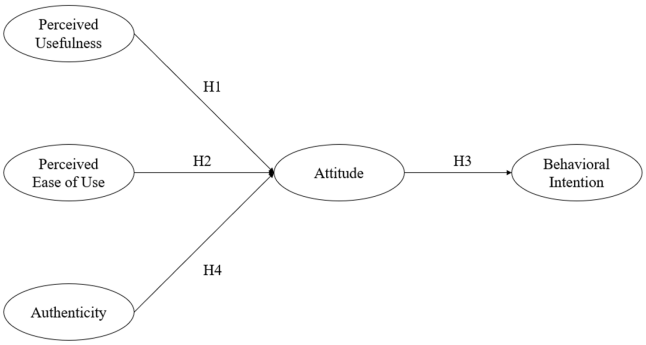

FIGURE 1 Research model.

15221970, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jtr.2727 by Cochrane Macao, Wiley Online Library on [12/08/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Hypothesis 4. Students' authentic experience positively affect their attitudes toward ChatGPT.

Based on the previous literature review and hypotheses, a research model is proposed (see Figure 1).

3 | RESEARCH METHOD

3.1 | Questionnaire design and measurements

The questionnaire design section of the current study was divided into three parts. In the first part, we included two screening questions, the research background and introduction. The second part consists of measurable items of the constructs. Three measurable items related to perceived usefulness and three measurable items related to perceived ease of use were adopted from Mailizar et al. (2021). The three measurable items of authenticity were borrowed from Kim et al. (2020b), while the measure of attitude has three items borrowed from Mailizar et al. (2021), and the measure of behavioural intention has three items borrowed from Bae and Han (2020) and Mailizar et al. (2021). The questions of the study have been translated and proofread by tourism and hospitality experts who are proficient in Chinese and English, since the respondents of the study are Chinese students majoring in tourism and hospitality. Seven-point scales were used to measure each of the questionnaire items. The last section requested socio-demographic information from participants. A pilot test was used first before formal data collection, which aims to improve the readability and quality of the survey. Respondents from pilot test were clear with the survey. Thus, the pilot data were excluded from current data analysis.

3.2 | Data collection

Online survey (Tencent questionnaire: https://wj.qq.com/) was used for data collection in this study. The veracity of the data based on the Tencent questionnaire has been used in education studies (Zhou et al., 2023). In the current questionnaire collection process, we provide two screening questions in the first part of the questionnaire: (1) Are you a student of tourism or hospitality management? (2) Have you ever applied ChatGPT in your studies? These two questions were used to solicit qualified participants. Finally, we completed the questionnaire collection at the end of July 2023, and a total of 198 valid surveys has been collected for the analysis of this study. Partial least squares structural equation modelling (PLS-SEM) is proper for small sample data. Therefore, based on the recommendations of previous studies (Hair et al., 2014), SmartPLS Version 3 was used for data analysis.

3.3 | Data analysis

To reduce the possible common method bias, this study firstly informed the participants the purpose of the study and divides the questionnaire into three parts. These practices can effectively reduce the common method bias during the data collection process (Kim et al., 2020b; Zhu, et al., 2023b). Based on Kock's (2015) suggestion regarding the analysis of possible common method bias issue based on PLS-SEM model, we also evaluated it by variance inflation factor (VIF) values to avoid multicollinearity (Lin et al., 2021), and found that all VIF indicators were below 3.3 (See Table 4). Therefore, the current study does not have any significant common method bias issue.

4 | FINDINGS

4.1 | Participants' background

Table 1 shows the profiles of 198 participants in this study. Among them, there were 82 male participants and 116 female participants. Most of the participants were in the field of hospitality management (61.5%).

4.2 | Reliability, validity and correlation

Tables 2 and 3 present the factor loadings, composite reliability, Cronbach's alpha and average variance extracted (AVE) for the 15 measurement items. Table 3 also shows the Fornell–Larcker metrics. PLS with 5000 samples was used for data analysis. It was found that all factor loadings, composite reliability and Cronbach's alpha were above 0.7; and AVE was above 0.5; the square-root of the construct's AVE was greater than its correlations with other constructs. Therefore, this research model received a good reliability and discriminant validity (Hair et al., 2014).

4.3 | Structural model assessment

Bootstrapping with 5000 samples was applied to the data analysis. Table 4 shows the results of the current study. It was found that all the hypotheses were supported. Authenticity had the most significant impact on the students' attitudes. The path coefficients from perceived ease of use, perceived usefulness and perceived authenticity on attitude are 0.141*, 0.283*** and 0.458***, respectively. Furthermore, attitude has a significant effect on behavioural intention (0.706***). To evaluate the predictability of the model, R^2 has been used to test the predictability of the model and the data showed that

TABLE 1 Participants' background ($N = 198$).

	Frequency	Percentage
Gender		
Male	82	41.4%
Female	116	58.6%
Subject background		
Tourism management	96	48.5%
Hospitality management	102	61.5%

15221970, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jtr.2727 by Cochrane Macao, Wiley Online Library on [12/08/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

the attitude and behavioural intention were 0.511 and 0.498, respectively, which exceeded 0.26, showing that the current research model is a good predictive model (Hair et al., 2014).

4.4 | Testing indirect effects

As a post-hoc test, the current study also tested the indirect effects of perceived usefulness, perceived ease of use and perceived authenticity on behavioural intention (see Table 5). PLS-SEM with 5000 samples revealed that perceived authenticity had the strongest effect on behavioural intention (0.323***).

TABLE 2 Measurable items.

Measurable items	Factor loading
Perceived usefulness (PU)	
PU1: The use of ChatGPT helps me access learning resources in learning.	0.786
PU2: The use of ChatGPT increases my productivity in learning.	0.846
PU3: The use of ChatGPT is beneficial for my learning activities in learning.	0.803
Perceived ease of use (PEU)	
PEU1: Learning to use ChatGPT is easy	0.809
PEU2: It is easy to navigate ChatGPT in learning	0.817
PEU3: The use of ChatGPT is flexible in learning.	0.861
Authenticity (AU)	
AU1: Using the ChatGPT provided me with genuine experiences	0.823
AU2: Using the ChatGPT provided me with exceptional experiences	0.904
AU3: Using the ChatGPT provided me with unique experiences	0.818
Attitude (AT)	
AT1: I like the use of ChatGPT in learning.	0.879
AT2: The use of ChatGPT is good in learning.	0.872
AT3: I think the ChatGPT is a trend in learning.	0.827
Behavioural intention (BI)	
BI1: I will use ChatGPT with no hesitation in learning.	0.795
BI2: I will use ChatGPT if it is available in learning.	0.776
BI3: I will recommend using ChatGPT in the future learning.	0.875

5 | CONCLUSION AND DISCUSSION

5.1 | Discussion

Tourism and hospitality education is gradually gaining attention among scholars (Adeyinka-Ojo et al., 2020; Kırlar-Can et al., 2021), the current study integrates authenticity into TAM theory. The findings show that authenticity has the strongest impact on students' attitudes and behavioural intentions. As previous scholars have pointed out that ChatGPT complements and enhances users' creativity in virtual networks (Zhou, 2023), the need for unique experiences in virtual networks also increases with the number of users. Authenticity is at the core of understanding AI-based technology experiences (Vo et al., 2024). ChatGPT, as a new technological experience from a theoretical perspective, is in line with the perception of authenticity in virtual information experiences as pointed out by previous research, which explains why authenticity has a stronger effect on attitudes (0.458***) and intentions (0.323***).

In addition to this, the study verified that perceived usefulness and perceived ease of use significantly enhance users' attitudes (0.283*** and 0.141*) and behavioural intentions (0.200** and 0.100*). As previously mentioned, from a conceptual point of view, perceived usefulness is the extent to which individuals perceive that using the new technology can help to finish tasks, perceived ease of use is the degree to which individuals perceive that using the new technology will save physical and mental energy (Copeland et al., 2023). In ChatGPT, because of the algorithms developed through AI, users only need to input some simple instructions, and the rest of the work can be done by ChatGPT. Therefore, ChatGPT well ensures the characteristics of perceived usefulness and perceived ease of use.

5.2 | Theoretical contributions

Our work also provides some potential theoretical contributions. First, although scholars have recently used qualitative research to compare

TABLE 3 Reliability, validity and correlations.

				Fornell–Larcker				
Constructs	Cronbach's alpha	CR	AVE	AT	BI	AU	PEU	PU
Attitude (AT)	0.823	0.894	0.739	*0.859*				
Behavioural intention (BI)	0.748	0.857	0.666	0.706	*0.816*			
Authenticity (AU)	0.805	0.885	0.721	0.642	0.608	*0.849*		
Perceived ease of use (PEU)	0.776	0.868	0.688	0.432	0.388	0.385	*0.829*	
Perceived usefulness (PU)	0.741	0.853	0.659	0.55	0.472	0.457	0.403	*0.812*

Note: Italic font represents square-root of the AVE.
Abbreviations: AVE, average variance extracted; CR, construct reliability.

15221970, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jtr.2727 by Cochrane Macao, Wiley Online Library on [12/08/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 4 Analysis of partial least squares structural equation modelling.

	Path coefficient	*f*-square	VIF	Supported
H1: PU → AT	0.283***	0.120	1.369	Yes
H2: PEU → AT	0.141*	0.032	1.271	Yes
H3: AT → BI	0.706***	0.994	1.000	Yes
H4: AU → AT	0.458***	0.319	1.346	Yes

Abbreviations: AT, attitude; AU, authenticity; BI, behavioural intention; PEU, perceived ease of use; PU, perceived usefulness.
***$p < 0.001$. *$p < 0.05$.

TABLE 5 Testing indirect effects.

	Total indirect effect	*T* statistics	*p* values
Perceived authenticity → behavioural intention	0.323***	5.418	0.000
Perceived of ease of use → behavioural intention	0.100*	1.994	0.046
Perceived usefulness → behavioural intention	0.200**	3.45	0.001

***$p < 0.001$. **$p < 0.01$. *$p < 0.05$.

and identify teachers and students towards ChatGPT in work and learning by applying the TAM theoretical foundation (Iqbal et al., 2022; Shoufan, 2023), empirical studies involving ChatGPT and tourism and hospitality management are still in their infancy. Therefore, our study bridges this first research gap by empirically validating the theoretical model of TAM in using ChatGPT.

Furthermore, this study contributes to authenticity research in AI-based ChatGPT through integrating the TAM model. Previous research noted that authenticity has been increasingly applied to the interpretation of digital tourism experiences (Chen et al., 2022; Coşkun, 2021). Meanwhile, recent studies have pointed out that authenticity is central to the understanding of AI-based technology experiences (Pandey & Rai, 2024; Vo et al., 2024). There are scholars who argue that users fail to produce authenticity when using ChatGPT (Šlapeta, 2023). Our work addressed this research gap by empirically demonstrating that the effect authenticity in ChatGPT and found authenticity provided the strongest effect on student responses to ChatGPT compared to perceived usefulness and perceived ease of use.

5.3 | Practical contributions

Our work also provides several practical implications. To begin with, the current study provides an empirical basis for tourism and hospitality education to understand students' responses to ChatGPT. The study found that students' attitudes and use intentions toward ChatGPT were generally welcoming. Therefore, tourism and hospitality education administrators should properly guide students to use ChatGPT in their learning. For example, administrators can set up ChatGPT training seminars to instruct students on how to use ChatGPT in their professional classes. Before attending classes, for example, students can use ChatGPT to preview relevant professional knowledge and compare it with literature to achieve better preview results, thus allowing the potential of ChatGPT to be leveraged in learning.

Despite ChatGPT's strong role as a learning aid, it is inevitable that there may still be students who use ChatGPT inappropriately, for example, by using ChatGPT's AI writing to help with coursework. From these perspectives, educational administrators need to establish a set of testing rules, that is, detecting whether there is a portion of students who use ChatGPT for manual writing while ignoring their own writing and thinking. Moreover, for the developers of ChatGPT, authenticity is an important concept affecting students' attitudes and intentions to use it. This places new demands on ChatGPT's coding and algorithms, as well as better demands on educational administrators to be more precise and effective in producing the information that student users need.

Finally, the emergence of ChatGPT brings opportunities for tourism and hospitality education. For example, ChatGPT can help teachers to better prepare their lessons and help students to prepare and understand what they are learning in advance. In addition to applications in education, ChatGPT can also be used for travel planning and decision making. Therefore, it is important for teachers or students to properly embrace new technologies to continuously improve education and teaching reforms.

5.4 | Limitations and future study

Despite some potential contributions presented above, there are still some research deficiencies. First, from a theoretical perspective, our work only focuses on integrating authenticity into TAM theory, and some other important concepts, such as ChatGPT's perceived trust and system quality's effect on tourists' intention to use, still need to be empirically verified. Future research's effort on investigating these factors will extend our theoretical framework. Furthermore, from a research methodology point of view, the research on ChatGPT in

15221970, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jtr.2727 by Cochrane Macao, Wiley Online Library on [12/08/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

tourism and hospitality management remains insufficient. Mixed method research should be applied in future study. Finally, exploring student responses to ChatGPT in other countries using the current research model is also of interest.

DATA AVAILABILITY STATEMENT

Research data are not shared.

ORCID

Chris Zhen Gan Zhu https://orcid.org/0000-0003-2475-4897
C. Michael Hall https://orcid.org/0000-0002-7734-4587
Lawrence Hoc Nang Fong https://orcid.org/0000-0001-7107-3360
Feifei Lin https://orcid.org/0000-0003-0315-2694
Sara Naderi Koupaei https://orcid.org/0000-0001-6118-1288

REFERENCES

Acosta-Enriquez, B. G., Arbulú Ballesteros, M. A., Arbulu Perez Vargas, C. G., Orellana Ulloa, M. N., Gutiérrez Ulloa, C. R., Pizarro Romero, J. M., Gutiérrez Jaramillo, N. D., Cuenca Orellana, H. U., Ayala Anzoátegui, D. X., & López Roca, C. (2024). Knowledge, attitudes, and perceived ethics regarding the use of ChatGPT among generation Z university students. *International Journal for Educational Integrity*, *20*(1), 10.

Adeyinka-Ojo, S., Lee, S., Abdullah, S. K., & Teo, J. (2020). Hospitality and tourism education in an emerging digital economy. *Worldwide Hospitality and Tourism Themes*, *12*(2), 113–125.

Alassafi, M. O. (2022). E-learning intention material using TAM: A case study. *Materials Today: Proceedings*, *61*, 873–877.

Alateeg, S. S., & Alhammadi, A. D. (2023). Traditional retailer's intention to opt e-commerce for digital retail business in Saudi Arabia. *Migration Letters*, *20*(7), 1307–1326.

Albayati, H. (2024). Investigating undergraduate students' perceptions and awareness of using ChatGPT as a regular assistance tool: A user acceptance perspective study. *Computers and Education: Artificial Intelligence*, *6*, 100203. https://doi.org/10.1016/j.caeai.2024.100203

Alshurafat, H., Al Shbail, M. O., Masadeh, W. M., Dahmash, F., & Al-Msiedeen, J. M. (2021). Factors affecting online accounting education during the COVID-19 pandemic: An integrated perspective of social capital theory, the theory of reasoned action and the technology acceptance model. *Education and Information Technologies*, *26*(6), 6995–7013.

Arachchi, H. D. M., & Samarasinghe, G. D. (2024). Impact of embedded AI mobile smart speech recognition on consumer attitudes towards AI and purchase intention across generations X and Y. *European Journal of Management Studies*, *29*(1), 3–29.

Bae, S. Y., & Han, J. H. (2020). Considering cultural consonance in trustworthiness of online hotel reviews among generation Y for sustainable tourism: An extended TAM model. *Sustainability*, *12*(7), 2942.

Baidoo-Anu, D., & Owusu Ansah, L. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. SSRN 4337484. https://doi.org/10.2139/ssrn.4337484

Bang, Y., Cahyawijaya, S., Lee, N., Dai, W., Su, D., Wilie, B., Lovenia, H., Ji, Z., Yu, T., & Chung, W. (2023). A multitask, multilingual, multimodal evaluation of ChatGPT on reasoning, hallucination, and interactivity. ArXiv Preprint. ArXiv:2302.04023.

Bano, N., & Siddiqui, S. (2022). Consumers' intention towards the use of smart technologies in tourism and hospitality (T&H) industry: A deeper insight into the integration of TAM, TPB and trust. *Journal of Hospitality and Tourism Insights*, *7*, 1412–1434. https://doi.org/10.1108/JHTI-06-2022-0267

Barrot, J. S. (2023). Using ChatGPT for second language writing: Pitfalls and potentials. *Assessing Writing*, *57*, 100745. https://doi.org/10.1016/j.asw.2023.100745

Blut, M., Chong, A. Y. L., Tsiga, Z., & Venkatesh, V. (2022). Meta-analysis of the unified theory of acceptance and use of technology (UTAUT): Challenging its validity and charting a research agenda in the red ocean. *Journal of the Association for Information Systems*, *23*(1), 13–95. https://ssrn.com/abstract=3834872

Carlos Roca, J., José García, J., & José de la Vega, J. (2009). The importance of perceived trust, security and privacy in online trading systems. *Information Management & Computer Security*, *17*(2), 96–113.

Castiblanco Jimenez, I. A., Cepeda García, L. C., Violante, M. G., Marcolin, F., & Vezzetti, E. (2020). Commonly used external TAM variables in e-learning, agriculture and virtual reality applications. *Future Internet*, *13*(1), 7.

Chen, X., Hyun, S. S., & Lee, T. J. (2022). The effects of parasocial interaction, authenticity, and self-congruity on the formation of consumer trust in online travel agencies. *International Journal of Tourism Research*, *24*(4), 563–576.

Copeland, L. R., Bhaduri, G., & Huang, O. (2023). Understanding Chinese Gen Z and their online shopping intentions through TAM. *Asia Pacific Journal of Marketing and Logistics*, *35*, 2361–2376. https://doi.org/10.1108/APJML-03-2022-0241

Coşkun, G. (2021). Authentic experience in tourism and commodification. *Journal of Tourism Leisure and Hospitality*, *3*(2), 95–102.

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

Duong, C. D. (2024). Modeling the determinants of HEI students' continuance intention to use ChatGPT for learning: A stimulus–organism–response approach. *Journal of Research in Innovative Teaching & Learning*. https://doi.org/10.1108/JRIT-01-2024-0006

Elkhatat, A. M. (2023). Evaluating the authenticity of ChatGPT responses: A study on text-matching capabilities. *International Journal for Educational Integrity*, *19*(1), 15. https://doi.org/10.1007/s40979-023-00137-0

Fui-Hoon Nah, F., Zheng, R., Cai, J., Siau, K., & Chen, L. (2023). Generative AI and ChatGPT: Applications, challenges, and AI-human collaboration. *Journal of Information Technology Case and Application Research*, *25*(3), 277–304.

Gado, S., Kempen, R., Lingelbach, K., & Bipp, T. (2022). Artificial intelligence in psychology: How can we enable psychology students to accept and use artificial intelligence? *Psychology Learning & Teaching*, *21*(1), 37–56.

Gao, B. W., Jiang, J., & Tang, Y. (2020). The effect of blended learning platform and engagement on students' satisfaction—The case from the tourism management teaching. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *27*, 100272.

Hair, J., Hult, G. T., Ringle, C., & Sarstedt, M. (2014). A primer on partial least squares structural equation modeling (PLS-SEM). 2014 Faculty Bookshelf. https://digitalcommons.kennesaw.edu/facbooks2014/39

Himel, M. T. A., Ashraf, S., Bappy, T. A., Abir, M. T., Morshed, M. K., & Hossain, M. N. (2021). Users' attitude and intention to use mobile financial services in Bangladesh: An empirical study. *South Asian Journal of Marketing*, *2*(1), 72–96.

Hua, L., & Wang, S. (2019). Antecedents of consumers' intention to purchase energy-efficient appliances: An empirical study based on the technology acceptance model and theory of planned behavior. *Sustainability*, *11*(10), 2994.

Iqbal, N., Ahmed, H., & Azhar, K. A. (2022). Exploring teachers' attitudes towards using chatgpt. *Global Journal of Management and Administration Science*, *3*, 97–111.

Ivanov, S., & Soliman, M. (2023). Game of algorithms: ChatGPT implications for the future of tourism education and research. *Journal of Tourism Futures*, *9*(2), 214–221.

15221970, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jtr.2727 by Cochrane Macao, Wiley Online Library on [12/08/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Jo, H. (2023). Decoding the ChatGPT mystery: A comprehensive exploration of factors driving AI language model adoption. *Information Development*. https://doi.org/10.1177/02666669231202764

Keshavarz, P., Bagherieh, S., Nabipoorashrafi, S. A., Chalian, H., Rahsepar, A. A., Kim, G. H. J., Hassani, C., Raman, S. S., & Bedayat, A. (2024). ChatGPT in radiology: A systematic review of performance, pitfalls, and future perspectives. *Diagnostic and Interventional Imaging*, *105*, 251–265. https://doi.org/10.1016/j.diii.2024.04.003

Khalaf, M. A. (2024). Does attitude towards plagiarism predict aigiarism using ChatGPT? *AI and Ethics*, *2024*, 1–12. https://doi.org/10.1007/s43681-024-00426-5

Khalil, S., Kallmuenzer, A., & Kraus, S. (2023). Visiting museums via augmented reality: An experience fast-tracking the digital transformation of the tourism industry. *European Journal of Innovation Management*, *27*, 2084–2100. https://doi.org/10.1108/EJIM-09-2022-0479

Kim, M. J., Lee, C.-K., & Jung, T. (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of Travel Research*, *59*(1), 69–89.

Kim, M. J., Lee, C.-K., & Preis, M. W. (2020). The impact of innovation and gratification on authentic experience, subjective well-being, and behavioral intention in tourism virtual reality: The moderating role of technology readiness. *Telematics and Informatics*, *49*, 101349.

Kırlar-Can, B., Ertaş, M., & Kozak, M. (2021). Understanding the philosophy of tourism education: A perspective study in Turkey. *International Journal of Tourism Research*, *23*(6), 1112–1125.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration*, *11*(4), 1–10.

Koutromanos, G., Mikropoulos, A. T., Mavridis, D., & Christogiannis, C. (2024). The mobile augmented reality acceptance model for teachers and future teachers. *Education and Information Technologies*, *29*(7), 7855–7893.

Lai, P. C. (2017). Security as an extension to TAM model: Consumers' intention to use a single platform E-Payment. *Asia-Pacific Journal of Management Research and Innovation*, *13*(3–4), 110–119.

Liesa-Orús, M., Latorre-Cosculluela, C., Sierra-Sánchez, V., & Vázquez-Toledo, S. (2023). Links between ease of use, perceived usefulness and attitudes towards technology in older people in university: A structural equation modelling approach. *Education and Information Technologies*, *28*(3), 2419–2436.

Lin, V. S., Qin, Y., & Wu, J. (2021). Determinants of Chinese households' tourism consumption: Evidence from China Family Panel Studies. *International Journal of Tourism Research*, *23*(4), 542–554.

Liu, G., & Ma, C. (2024). Measuring EFL learners' use of ChatGPT in informal digital learning of English based on the technology acceptance model. *Innovation in Language Learning and Teaching*, *18*(2), 125–138.

Ma, X., & Huo, Y. (2023). Are users willing to embrace ChatGPT? Exploring the factors on the acceptance of chatbots from the perspective of AIDUA framework. *Technology in Society*, *75*, 102362. https://doi.org/10.1016/j.techsoc.2023.102362

Mailizar, M., Almanthari, A., & Maulina, S. (2021). Examining teachers' behavioral intention to use E-learning in teaching of mathematics: An extended TAM model. *Contemporary Educational Technology*, *13*(2), ep298.

Muflih, M. (2023). Muzakki's adoption of mobile service: Integrating the roles of technology acceptance model (TAM), perceived trust and religiosity. *Journal of Islamic Accounting and Business Research*, *14*(1), 21–33.

Panda, S., & Kaur, N. (2023). Exploring the viability of ChatGPT as an alternative to traditional chatbot systems in library and information centers. *Library Hi Tech News*, *40*(3), 22–25.

Pandey, P., & Rai, A. K. (2024). Analytical modeling of perceived authenticity in AI assistants: Application of PLS-predict algorithm and importance-performance map analysis. *South Asian Journal of Business Studies*. https://doi.org/10.1108/SAJBS-04-2023-0102

Pantanowitz, J., & Pantanowitz, L. (2023). Implications of ChatGPT for cytopathology and recommendations for updating JASC guidelines on the responsible use of artificial intelligence. *Journal of the American Society of Cytopathology*, *12*(6), 389–394.

Papakostas, C., Troussas, C., Krouska, A., & Sgouropoulou, C. (2023). Exploring users' behavioral intention to adopt mobile augmented reality in education through an extended technology acceptance model. *International Journal of Human–Computer Interaction*, *39*(6), 1294–1302.

Qadir, J. (2023). Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education. In *2023 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1–9). IEEE. https://doi.org/10.1109/EDUCON54358.2023.10125121

Saif, N., Khan, S. U., Shaheen, I., ALotaibi, F. A., Alnfiai, M. M., & Arif, M. (2024). Chat-GPT; validating technology acceptance model (TAM) in education sector via ubiquitous learning mechanism. *Computers in Human Behavior*, *154*, 108097.

Shen, S., Xu, K., Sotiriadis, M., & Wang, Y. (2022). Exploring the factors influencing the adoption and usage of augmented reality and virtual reality applications in tourism education within the context of COVID-19 pandemic. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *30*, 100373.

Shoufan, A. (2023). Exploring students' perceptions of CHATGPT: Thematic analysis and follow-up survey. *IEEE Access*, *11*, 38805–38818. https://doi.org/10.1109/ACCESS.2023.3268224

Sinha, A., & Bag, S. (2023). Intention of postgraduate students towards the online education system: Application of extended technology acceptance model. *Journal of Applied Research in Higher Education*, *15*(2), 369–391.

Šlapeta, J. (2023). Are ChatGPT and other pretrained language models good parasitologists? *Trends in Parasitology*, *39*, 314–316. https://doi.org/10.1016/j.pt.2023.02.006

Suhartanto, D., Dean, D., Ismail, T. A. T., & Sundari, R. (2020). Mobile banking adoption in Islamic banks: Integrating TAM model and religiosity-intention model. *Journal of Islamic Marketing*, *11*(6), 1405–1418.

Tiwari, C. K., Bhat, M. A., Khan, S. T., Subramaniam, R., & Khan, M. A. I. (2023). *What drives students toward ChatGPT?* Interactive Technology and Smart Education. https://doi.org/10.1108/ITSE-04-2023-0061

Ukpabi, D. C., & Karjaluoto, H. (2017). Consumers' acceptance of information and communications technology in tourism: A review. *Telematics and Informatics*, *34*(5), 618–644.

Vaccino-Salvadore, S. (2023). Exploring the ethical dimensions of using ChatGPT in language learning and beyond. *Languages*, *8*(3), 191. https://doi.org/10.3390/languages8030191

Vo, D. T., Nguyen, L. T. V., Dang-Pham, D., & Hoang, A. P. (2024). When young customers co-create value of AI-powered branded app: The mediating role of perceived authenticity. *Young Consumers*. https://doi.org/10.1108/YC-06-2023-1759

Yu, H. (2023). Reflection on whether Chat GPT should be banned by academia from the perspective of education and teaching. *Frontiers in Psychology*, *14*, 1181712.

Yung, R., & Khoo-Lattimore, C. (2019). New realities: A systematic literature review on virtual reality and augmented reality in tourism research. *Current Issues in Tourism*, *22*(17), 2056–2081.

Zhou, P. (2023). Unleasing chatgpt on the metaverse: Savior or destroyer? ArXiv:2303.13856. https://doi.org/10.48550/arXiv.2303.13856

15221970, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jtr.2727 by Cochrane Macao, Wiley Online Library on [12/08/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Zhou, Q., Sotiriadis, M., & Shen, S. (2023). Using TikTok in tourism destination choice: A young Chinese tourists' perspective. *Tourism Management Perspectives*, *46*, 101101.

Zhu, C., Hall, C. M., Fong, L. H. N., Liu, C. Y. N., & Naderi Koupaei, S. (2023). Does a good story prompt visit intention? Evidence from the augmented reality experience at a heritage site in China. *Journal of Heritage Tourism*, *18*(4), 427–444.

Zhu, C., Wu, D. C. W., Hall, C. M., Fong, L. H. N., Koupaei, S. N., & Lin, F. (2023). Exploring non-immersive virtual reality experiences in tourism: Empirical evidence from a world heritage site. *International Journal of Tourism Research*, *25*(3), 372–383.

How to cite this article: Zhu, C. Z. G., Hall, C. M., Fong, L. H. N., Lin, F., & Naderi Koupaei, S. (2024). Examining the effects of ChatGPT on tourism and hospitality student responses through integrating technology acceptance model. *International Journal of Tourism Research*, *26*(4), e2727. https://doi.org/10.1002/jtr.2727

15221970, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/jtr.2727 by Cochrane Macao, Wiley Online Library on [12/08/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

View publication stats