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Integrating Tam and UGT to explore students' motivation for using ChatGPT for learning in Vietnam

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Abstract

Purpose – This study combines the TAM and UGT frameworks to investigate how Vietnamese students' views of ChatGPT and intrinsic needs affect their intentions to use it for education (via variables including perceived ease of use, perceived usefulness, novelty, information seeking and academic content creation). We will employ TAM theory (Davis, 1989) and UGT theory to elucidate university students' motivations for utilising ChatGPT in Vietnam. Simultaneously, we aim to address the limitation stemming from data uniformity. Our research will make a substantial contribution to the understanding of researchers regarding the use of ChatGPT and its varied consequences as it grows and develops.

Design/methodology/approach – This study was conducted at a private university in Vietnam with an estimated population of 15,000 students. One of Vietnam's top private information technology institutions requires its students to use a variety of information and communication technologies (ICTs) on a regular basis to facilitate and enjoy their academic pursuits (Ngo, 2024; Nguyen). Students who are familiar with ChatGPT and have access to it for educational purposes are the ones that were chosen. This research is a quantitative study that utilises primary data through a survey method. Participants answered a questionnaire online through the Google Form platform sharing via social media platforms from October to December 2023. The questionnaire was divided into two sections: the first contained screening questions and demographic information and the second had five-point Likert-scale questions that measured the study's components. Two screening questions are used to separate out the intended responders. (i.e. "I have heard the name ChatGPT" and "I know about ChatGPT") were set to find whether the participants had any knowledge of ChatGPT. If participants were unaware of ChatGPT, their responses were not included in the study. A total of 283 responses were received. The participant's demographic information is shown in Table 1. It is believed that a sample size of more than 200 provides adequate statistical power for data analysis in structural equation modelling. It is evident that the 283-sample size in this study is adequate to evaluate the research hypothesis and the fitting model. 42.9% of the 283 research samples were made up of men, while 57.1% were women. Business administration accounted for 40.1% of survey respondents, followed by information technology (25.2%) and English language (14.5%). The average ChatGPT usage time of respondents was 56 min in a single use. The study sample's average age is 20–72 years old.

Findings – The present study contributes to the existing AI chatbot literature in the educational industry in several ways. First, this study addresses a gap in the literature by investigating the factors that influence students' ITU ChatGPT for educational purposes in Vietnam. Using the extended model, we investigated

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factors influencing students' intentions to use ChatGPT. It integrates three motive factors of the UGT (ACT, IS and N) with the core factors of TAM (PeoU and PU). The integrated framework's findings indicate that in a Vietnamese educational setting, ChatGPT is a novel technology that should be considered in conjunction with PU and PEoU.

Research limitations/implications – First, only Vietnamese students make up the research sample. To increase the relevance of the findings, it is advised that future research look at the study model in various geographic regions. Second, the present investigation's constraints arise from the lack of clarity about the Chat GPT version utilised by the respondents, specifically whether it was the free or premium edition. Furthermore, the limited duration of the survey presents an obstacle to gathering thorough data. Due to their reliance on the particular features and functionalities of the Chat GPT version used, these restrictions may have an effect on the researcher's objectivity. Furthermore, the limited survey time may curtail the coverage of the collected answers, particularly considering that our survey predominantly focuses on business administration students, thus limiting the diversity and richness of the gathered data. We recommend that future studies should conduct comparative research between different versions of GPT Chat, including free and paid variants that can provide valuable insights into potential differences in performance and results. Such analysis can provide a deeper understanding of the strengths and limitations of different GPT Chat versions. Third, because the study focused on behavioural intention, actual usage and post-usage behaviour may not be covered by the findings. To gain a deeper understanding of users' actual behaviour, we suggest doing research on their usage and post-usage behaviours.

Practical implications – The findings will assist service providers and legislators in determining critical variables and influencing students' incentives to use ChatGPT in educational settings that use constructivist teaching methods. As a result, the information will assist service providers in creating AI chatbots that are more user-friendly, visually appealing, efficient, safe and convenient for education. Governments, in conjunction with service providers, have the potential to significantly accelerate the adoption of AI-based chatbots by highlighting their ethical and sustainable use. The findings demonstrate that students' ITU towards ChatGPT is substantially impacted by PU and PEoU. It is recommended that service providers emphasize the advantages and ease of use of AI chatbots in order to draw new clients. Additionally, in order to promote ChatGPT or related technologies, marketers should concentrate on raising the technology's perceived novelty value. This is because people are open to new technologies as long as they believe they are interesting and innovative.

Originality/value – ChatGPT is an advanced AI-powered chatbot that has the potential to advance and revolutionize the learning and teaching process. This study attempted to look at the elements that lead students to want to use ChatGPT from an academic standpoint by combining the UGT and TAM. For practitioners, academics and educators, the findings provide a solid knowledge of and encouragement for the sustainable use of such AI tools. Despite having important practical consequences, the study contains a number of limitations that indicate possible research gaps that should be filled by further investigation.

Keywords ChatGPT, Education, Technology, Motivation, ChatGPT for learning, Vietnamese students

Paper type Research paper

Introduction

Artificial intelligence (AI) has become a significant and potentially useful field in many facets of life in the era of digitization. Numerous new possibilities have arisen because of AI's capacity to analyse complicated data, impart knowledge, and communicate with people. With the increasing demand for flexibility and self-learning, students frequently employ artificial intelligence technologies like ChatGPT, which have become an essential component of university students' learning processes (Rudolph *et al.*, 2023).

Created by OpenAI, as of January 2023, the ChatGPT artificial intelligence model had over 100 million active users, making it one of the consumer apps with the quickest rate of growth (Duong *et al.*, 2023). ChatGPT serves as an essential learning tool for university students, granting them the flexibility to tailor their learning to personal preferences in terms of timing and location, thus accelerating the creation of a personalized and efficient learning experience (Rudolph *et al.*, 2023). Still, it's crucial to recognize that excessively relying on ChatGPT may hinder students' ability to generate creative ideas, emphasizing the significance of ongoing research (Saif *et al.*, 2024). As ChatGPT technology is still in development, numerous facets warrant further exploration. Coupled with the proliferation of information and rapid AI advancements, understanding students' motivations for utilising ChatGPT remains pivotal.

This comprehension can aid in devising effective strategies to harness the tool, ensuring it enhances students' creativity and knowledge growth in a balanced manner.

Previous research has shown that there are numerous educational benefits to deploying AI-based chatbots (Foroughi *et al.*, 2023). These chatbots may provide students with information at different times and places, provide individualized assistance by remembering previous exchanges, and provide timely feedback in a way that resembles human communication (Chan *et al.*, 2023). Additionally, students can utilise chatbots to manage their expertise and finish projects because they possess special abilities (Chan *et al.*, 2023). The elements that affect a person's propensity to use (IU) chatbots for education have been the subject of an increasing amount of research (Foroughi *et al.*, 2023).

Created by OpenAI, as of January 2023, the ChatGPT artificial intelligence model had over 100 million active users, making it one of the consumer apps with the quickest rate of growth (Ma *et al.*, 2024). Interestingly, right after being launched, ChatGPT serves as an essential learning tool for university students, granting them the flexibility to tailor their learning to personal preferences in terms of timing and location, thus accelerating the creation of a personalized and efficient learning experience (Rudolph *et al.*, 2023). Several sections of academic articles have been written using ChatGPT (Duong *et al.*, 2023). Scholars advise using ChatGPT as an add-on to write more effectively, examine material (Saif *et al.*, 2024), and reword content (Almeida *et al.*, 2023). As this advancement in AI appears to alter current educational methods, educators have expressed a variety of reactions to this tool's remarkable capacity to carry out challenging tasks in the field of education. Additionally, there is a chance that a student's capacity to come up with original ideas could be hampered by an excessive reliance on Chat GPT.

Some scholars are eager to understand why people want to try new technology for their learning. Jishnu *et al.* (2023) investigate the utilisation of ChatGPT in education by deploying the UGT. The analysis reveals that students predominantly employ ChatGPT for tasks related to academic content creation, information retrieval, novelty, and convenience. The research solely examines students' motivations, making it less broadly applicable. Yilmaz *et al.* (2023) conduct a study on students' views regarding chatGPT using the Technology Acceptance Model (TAM), a well-established theoretical framework designed to grasp individual acceptance and utilisation of emerging technology, as outlined by Davis in 1989. The study demonstrates that individuals' attitudes toward adopting information technology are shaped by two primary factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). The findings indicated an overall favourable perception of GPT Chat among the participants. Interestingly, the sole noteworthy difference in perceptions between male and female students emerged in the "Perceived ease of use" aspect. While numerous studies have investigated the role and challenges of ChatGPT in education, empirical evidence regarding the factors influencing students' information-seeking behaviour in ChatGPT remains limited. With the increasing adoption of ChatGPT in programming courses, there is a need to understand how students interact with ChatGPT and its impact on their learning and assessment activities.

In Vietnam, despite ChatGPT's popularity among learners, very little research has been done on why they use it. Nguyen and Dieu (2024) examined the opinions of Vietnamese students regarding ChatGPT as an AI writing aid for English language learning.

Moreover, this study examines the motives of students who are studying with constructivist learning approaches in Vietnam. Constructivist learning approaches, which draw inspiration from Piaget and Dewey, emphasize the value of giving students the chance to build their understanding of important concepts and information (Rauniar *et al.*, 2014). They also call for active student engagement in the learning process (Jonassen, 1994). In recent years, constructivist teaching approaches have increased scholarly interest in higher education in Vietnam. In line with the constructivist perspective, co-creation is

typically used as a learning strategy. Through co-creation, educators and students collaborate to create learning environments in which meeting learning objectives is a joint effort. According to Bovill *et al.* (2016), students participate more actively in the learning process by working with academic professionals to develop resources and understanding through the co-creation approach. Co-creation can be accomplished in a variety of methods. Examples include giving students the chance to conduct disciplinary research, incorporating them in the development of curricula, and involving them in the processes of teaching, learning, and assessment. In such cases, students are required to create their content, whatever form that may take. The vast range of audio-visual tools and cloud-based services that enable individuals to create high-quality content means that few logistical impediments to content creation remain. With the development of ChatGPT, many students also deployed it to create their academic content.

The current study aims to understand which motivations force Vietnamese youth, especially university students, to use ChatGPT for their study. Using an online survey to collect data and SmartPLS to analyse data, the authors mobilize the theoretical framework of TAM and UGT to explain Vietnamese students' motivation for the usage of ChatGPT. The choice of theoretical framework is based on a literature review.

To expand the findings in previous studies with current data from Vietnam regarding the Vietnamese youth's motivation to accept and use AI technologies for learning purposes in particular, and for self-development in general, the current study aims to examine university students' motivation for using ChatGPT. The current study took into account three pertinent variables based on the UGT (academic content creation, perceived informativeness, and perceived novelty) in addition to the variables of TAM (such as perceived usefulness and perceived ease of use).

Theoretical frameworks and hypothesis development

Through an examination of prior research, it is argued that TAM theory (Davis, 1989a, b) and Uses and Gratifications theory (Katz *et al.*, 1973) are widely used to elucidate university students' motivations for utilising an AI tool like ChatGPT for studying. Well-respected theories to investigate users' intention and behaviour related to technology adoption include the Technology Acceptance Model (TAM) (Davis, 1989a) and the Theory of Acceptance and Use of Technology (Venkatesh *et al.*, 2003). Indeed, these models are widely applied in many academic fields to investigate how people engage with different types of technology. Furthermore, the theory of uses and gratification has undergone four stages of development before being acknowledged by scientists in the field of communication (Mehrad and Tajer, 2016).

The TAM is the model that is most frequently used to analyse the acceptability of communication technology. Han *et al.* (2023) used the Technology Adoption Model (TAM model), which can be used to predict and detect the adoption of news, to investigate the motivation of university students in China to utilise social networks for news reading. Li *et al.* (2010) emphasized that TAM makes an effort to elucidate the factors influencing a user's choice to use a technique or not. According to Rauniar *et al.* (2014), perceived easiness and usefulness for individuals are important factors that either directly or indirectly affect their behavioural intentions. Han *et al.* (2023) used the TAM model to investigate the motivation of university students in China to utilise social networks for news reading. The findings indicate that college students recognize the convenience and utility of media technology, along with the contentment they experience (cognitively, socially, and emotionally) from its usage. Their primary motivation for using social media to access news is the influence of social media itself. A constraint of this study is that it was conducted amidst the COVID-19 pandemic, which resulted in a sample that lacks representation and diversity.

Therefore, it is well-established that TAM can be used to explain how users accept technology (Yang *et al.*, 2023). This model shows the relationship among perceived ease of use (PEU), perceived usefulness (PU), and intention to use technology (BI).

Intention to use

IU is the extent to which certain technology users have developed a plan of intent to continue utilising or not utilising a particular technology with their future behaviour.

Perceived ease of use (PEOU)

The perceived ease of use of a technology refers to the degree to which an individual believes that using it will require no mental effort (Davis, 1989a, b). According to Davis, a technical system's user-friendliness indicates its acceptability. If the necessary technology infrastructure is in place, students are more likely to utilise social networks for searching news Han *et al.* (2023). Such infrastructure includes user-friendly interfaces and messaging programmes that can work with different Internet-enabled phones. To make the infrastructure easy and manageable, organisations reduce the entrance barrier, making it simple for customers to use technology (Svendsen *et al.*, 2013). In other words, potential users of a particular technology will be ready to adopt it if it is simple to comprehend and utilise. Several researchers have shown that people who utilise technologies may have preconceived notions about how simple or complex technology would be to use (Jan and Contreras, 2011).

Researchers need to look into how easy consumers think a system is to use in order to determine what expectations users have. When building a technical product, it is important to consider how easy it is to use as it has a substantial impact on users' acceptance (Zhu *et al.*, 2023). Users are more inclined to use social media platforms such as Facebook if they can easily add a contact to their favourite messaging apps, such as Instagram and WhatsApp. ChatGPT may be readily accessed through the browser on any web-responsive device, even if it has an app version for computers, tablets, and smartphones. Additionally, ChatGPT's higher levels of usability are highlighted by the natural interaction feature, which may encourage users to have more intention to use ChatGPT. It is hypothesized:

H1. The students' perceived ease of use of ChatGPT will have a positive effect on their intentions to use them.

Perceived usefulness (PU)

The extent to which people think utilising new technology would enhance their capacity to complete their tasks is known as perceived usefulness. Any information technology's usefulness is thought to be a prerequisite for its acceptance and popularity. For example, usability has a significant behavioural impact on the intention to utilise social networks for news reading (Han *et al.*, 2023).

Users are more likely to embrace new technology if they think there is a value to it. Perceived utility and perceived ease of use, however, do not have an equal impact on a user's behavioural intention in TAM (Ryan and Worthington, 2021). Even while students might not consider internet treatment to be user-friendly, their perception of its benefits could influence their decision to use it (Ryan and Worthington, 2021).

In a similar vein, students might find a new piece of technology simple to use but not very helpful. Perceived utility has been found in multiple studies to be a significant factor in encouraging the usage of a particular technology (Wu and Wang, 2005). Users will typically accept technologies like virtual assistants if they think it's beneficial (Hussain *et al.*, 2019). Accordingly, it would be intriguing to investigate how perceived utility affects views on the usage of ChatGPT for learning. We proposed the following theory:

H2. The students' perceived usefulness of ChatGPT will have a positive effect on their intentions to use them.

H3. The students' perceived ease of use of ChatGPT will have a positive effect on their perceived usefulness.

Uses and gratifications theory (UGT)

One of the reasons the UGT is deployed in this study is that the theory perceives users as active factors rather than passive. In the field of education, the UGT focuses on the motives for using a particular tool and the factors that influence the motives. According to this theory, different learners use tools to fulfil different motives in learning (Papacharissi, 2014).

Some research used the UGT to understand why people use artificial intelligence applications. For instance, McLean and Osei-Frimpong (2019) examined the motivations behind employing artificial intelligence-powered virtual in-home voice assistants Alexa and Siri. Jo and Park (2023) examined the variables that led to the acceptance of ChatGPT in the workplace, such as the requirement for a thorough grasp of their effects on employee learning, productivity, and usage determinants. For the education sector, Foroughi *et al.* (2023) verified that ChatGPT's ability to improve student engagement and personalize instruction may transform education. The results showed that the intention to utilise ChatGPT is highly influenced by performance expectancy, effort expectancy, hedonic incentive, and learning value.

Even though ChatGPT is popular among the learner community, very scant literature deals with their motivations. The current study examines the different uses and gratifications behind using ChatGPT from the student's perspective. The study applies the uses and gratifications theory to ChatGPT to find specific gratifications in constructivist classes: demand for academic content creation; information seeking; and perceived novelty.

Demand for academic content creation

The co-creation pedagogy approach creates a strong learning community that can maximize undergraduate students' learning capacity and shape their higher-order thinking. Students were required to select a health education-related topic, search for relevant evidence-based information, and create posts, visuals, stories, videos, and hashtags that make it easier for the public to understand (Chan *et al.*, 2023). ChatGPT has applications in various sectors, including business and education. Particularly in the educational context, ChatGPT has been explored to assist students with writing essays, problem-solving, and programming tasks. Despite potential challenges and concerns, students increasingly rely on ChatGPT as a supplemental resource to enhance their understanding and problem-solving capabilities in constructivist classes. Therefore, it is hypothesised that:

H4. The students' demand for academic content creation by ChatGPT will have a positive effect on their intentions to use them.

The demand of seeking information

To successfully complete assignments in a constructivist classroom, including conducting disciplinary research, working with instructors to develop curricula, and participating in teaching, learning, and assessment processes, students must possess the abilities, resources, and tools necessary for information retrieval. The way that students gain knowledge and access information is being revolutionized by the development of AI technologies in the education industry (Rudolph *et al.*, 2023). Because ChapGPT facilitates student access to knowledge and information and supports their learning process, it can

be of significant advantage to students. Tutors' time can be saved, and students' learning can be enhanced by receiving feedback on their work via ChatGPT. Students can get homework help via ChatGPT. Through ChatGPT, students can get feedback on their tasks, improving their learning and sparing tutors' time. ChatGPT assists students with their schoolwork and provides timely responses to their inquiries (Yang *et al.*, 2023).

H5. The students' demand for information seeking by ChatGPT will have a positive effect on their intentions to use them.

Novelty

It has been shown that novelty (N) influences the uptake of technology (Alzyoud *et al.*, 2024). This metric evaluates the degree to which a product's novelty and originality add to its perceived uniqueness. Once consumers grasp that the technology is new, they typically find the task completion process to be considerably more fun (Alzyoud *et al.*, 2024). This enhances both the practical utility and enjoyment of utilising it (Karjaluoto *et al.*, 2019). It is stated that artificial intelligence (AI) is new and that using it in education is an innovative application of its capabilities in a fresh, important, and rapidly expanding field. It makes it possible for the students to complete their assignments engagingly (Baharun and Haslinda, 2022). This is important owing to enjoyment can reduce psychological resistance to new technologies (Ma and Huo, 2023).

AI is "a museum of great novelties" for academics (Irigaray and Stocker 2023). Furthermore, ChatGPT differs from earlier AI chatbots due to its distinct features, which demonstrates significant novelty (Ma and Huo, 2023). The novelty value of ChatGPT enhances the technological innovation it represents. Consequently, we added novelty value—an additional new variable—which has been shown to affect how well technology is received. Our results show that, whereas hedonic motivation, novelty value, and humanness negatively correlate with effort expectations, social influence, novelty value, and humanness positively correlate with performance expectations (Ma and Huo, 2023). Therefore, it is hypothesized that:

H6. The students' perception of novelty value of ChatGPT will have a positive effect on their intentions to use it.

Figure 1 summarizes the theoretical framework used in this study.

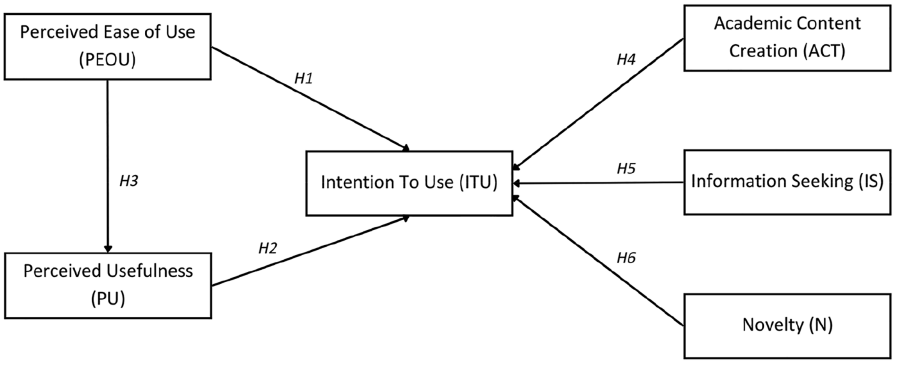

Figure 1.
Theoretical framework

Source(s): By the authors

Methodology

Research design

This study was conducted at a private University in Vietnam with an estimating population of 15.000 students. Students at one of the leading private information technology universities in Vietnam are required to use several information communication technologies (ICTs) daily to make their studies convenient and enjoyable. The university deploys constructivist learning approaches (Ngo, 2024). The selected students are those who know ChatGPT and have access to it for learning. The reason for selecting university students is that they are expected to have a deep awareness and knowledge of e-learning. Also, as members of the digital age, they are more accustomed to using the Internet and accessing online learning materials.

Participants answered a questionnaire online through the Google Form platform sharing via social media platforms from October to December 2023. The questionnaire was categorised into two parts: the first comprised demographic variables and screening questions; the second included the measurement items of constructs employed in the study with 5-point Likert-Scale questions. To sort out the target respondents, a couple of screening questions (i.e. "I have heard the name ChatGPT", "I know about ChatGPT") were set to find whether the participants had any knowledge of ChatGPT. Responses were excluded from the study if the participants had no knowledge regarding ChatGPT.

The objective – examining students' intention to use ChatGPT for learning – was clearly indicated in an introductory paragraph at the beginning of the questionnaire. The learning purposes include using ChatGPT for learning about writing my assignments, preparing presentation, writing research papers, essays, summarizing topics, notetaking, searching for a topic, cross-checking information, generating personalised feedback on the quality of their academic papers. Moreover, the research was exempt from the need for ethical clearance since it focused on the investigation of human behaviour rather than any experimentation involving humans and animals.

Measures

The measurement items of the questionnaire (see the Appendix) were chosen from previous studies with direct and modified formats. The items of perceived usefulness and perceived ease of use were adopted from Davis (1989b), three items of the UGT framework including Academic content creation, Information Seeking, and Novelty from Jishnu *et al.* (2023). Furthermore, the "Intention to use" items were adapted from Venkatesh *et al.* (2012). Each item of all variables in the study is measured using a 5-point Likert scale. The questions include: BI1. I intend to continue using mobile Internet in the future. BI2. I will always try to use mobile Internet in my daily life. BI3. I plan to continue to use mobile Internet frequently.

Results

The descriptive statistics

A total of 283 responses were received. More than 200-sample size in this study provides statistical power as there are multiple factors to consider in SEM to evaluate the research hypothesis and the fitting model.

Table 1 presents the demographic details of the participants. 42.9% of the 283 research samples were made up of men, while 57.1% were women. The average ChatGPT usage time of respondents was 56 min in a single use. The study sample's average age is 20,72 years old.

Structural equation modelling analysis

The findings in Table 2 reported that, in the main, the research participants were agreeing with the statements that were presented to them in the survey questionnaire. The mean

No	Demographic variable	Category	Frequency	Percent
1	Gender	male	121	42.9
		female	161	57.1
2	Age	18	5	1.8
		19	89	31.6
		20	59	20.9
		21	46	16.3
		22	29	10.3
		23	25	8.9
		24	26	9.2
		25	1	0.4
		26	1	0.4
		28	1	0.4
3	Major	Information technology	71	25.2
		English language	41	14.5
		Korean languages	23	8.2
		Japanese languages	34	12.1
		Business administration	113	40.1
4	Frequency of usage	Once every two days	53	18.8
		Daily	88	31.2
		Several times a month	48	17
		Several times a week	93	33

Table 1.
Descriptive analysis of demographic variables

Source(s): By authors

values were mostly above 3. Whilst IS1 (M = 3.90) was the highest mean score, ACT6 (M = 3.49) reported the lowest mean. The SD values were relatively low as the highest variance figure was 1.324 (for ACT6) which was deleted. This study did not exhibit any evidence of common technique bias, according to a collinearity assessment. The outcomes of outer loadings, variance inflation factors (VIF), and the constructs' convergent and discriminant validity values are displayed in Tables 2 and 3, together with their reliabilities and convergent validities as measured by the average variance extracted (AVE).

The VIFs were <3.0. The outer loadings ranged between 0.653 and 0.941. As the loadings of ACT6, IS7, and N6 were lower than 0.7, they were deleted. The findings confirmed that the reliability values were higher than 0.7. The AVE figures were above 0.6. The constructs' discriminant validities were tested (Fornell and Larcker, 1981). The former reported that the square roots of AVE were higher than the other correlation values (within the same columns).

The PLS algorithm also provided details about the robustness of the structured model. It clearly indicated the factors' predictive power and shed light on the values of R2 and $f2$. It revealed that PeoU affected 32.6% of their PU and the independent constructs affected 76,4% of their intentions to use ChatGPT for learning.

The study's hypotheses were investigated using the bootstrapping technique. The results validated the suggested structural model's robustness. Table 4 reported extremely substantial effects between the exogenous and endogenous constructs. The most significant link was between PEOU and PU (H3), where $\beta = 0.571$, $t = 9.737$ and $p < 0.001$. Highly significant effects were reported in H2, between PU and ITU ($\beta = 0.338$, $t = 6.492$ and $p < 0.001$) and in H1 between PEOU and ITU ($\beta = 0.229$, $t = 4.728$ and $p < 0.001$). Interestingly, while there was no link between ACT and ITU (H4), where $\beta = 0{,}03$, $t = 0.958$ and $p = 0.338$), significant effects were found in H6 between N and ITU ($\beta = 0.247$, $t = 4{,}864$, and $p < 0.001$), and in H5, between IS and ITU ($\beta = 0.236$, $t = 4{,}485$, and $p < 0.001$). The results are supported by previous studies (Yilmaz *et al.*, 2023). For the relations between ACT and ITU, this may need to be further studied to understand.

	Construct	Items	Mean	Std. deviation	Outer loadings	VIF	Alpha	(rho_a)	CR	AVE
1	PEOU	PEOU1	3.80	1.082	0.840	1,764	0.777	0.777	0.870	0.691
		PEOU2	3.76	1.084	0.813	1,437				
		PEOU3	3.80	1.068	0.841	1,752				
2	PU	PU1	3.61	1.115	0.857	1,807	0.819	0.821	0.892	0.734
		PU2	3.80	1.037	0.860	1,804				
		PU3	3.69	1.071	0.854	1,872				
3	ACT	ACT1	3.65	1.019	0.767	1,810	0.855	0.898	0.894	0.628
		ACT2	3.66	0.980	0.745	1,688				
		ACT3	3.66	1.032	0.854	1,979				
		ACT4	3.65	1.097	0.829	1,832				
		ACT5	3.94	1.005	0.762	1,815				
4	IS	IS1	3.90	1.015	0.751	1,763	0.868	0.873	0.900	0.601
		IS2	3.89	0.952	0.749	1,851				
		IS3	3.72	1.072	0.793	1,923				
		IS4	3.75	1.031	0.784	1,834				
		IS5	3.88	0.985	0.768	1,810				
		IS6	3.35	1.211	0.805	1,934				
5	N	N1	3.73	1.093	0.848	2,318	0.883	0.884	0.915	0.682
		N2	3.67	1.023	0.793	1,875				
		N3	3.75	1.102	0.844	2,256				
		N4	3.62	1.030	0.813	1,969				
		N5	3.64	1.082	0.829	2,136				
6	ITU	ITU1	3.70	1.137	0.802	1,769	0.862	0.864	0.906	0.707
		ITU2	3.68	1.162	0.854	2,103				
		ITU3	3.52	1.197	0.857	2,219				
		ITU4	3.58	1.164	0.850	2,085				
		Valid N = 26								

Source(s): By authors

Table 2. The construct reliability and validity values

	ACT	IS	ITU	N	PEOU	PU
ACT	0.793					
IS	0.245	0.775				
ITU	0.271	0.717	0.841			
N	0.227	0.723	0.734	0.826		
PEOU	0.218	0.592	0.718	0.604	0.831	
PU	0.228	0.473	0.712	0.506	0.571	0.857

Source(s): By authors

Table 3. Fornell-Larcker criterion

Figure 2 demonstrates the final research model on evaluating the factors influencing users'motivation to use ChatGPT for learning. The figure shows the summary from Tables 2–4, between inner model (Path Coefficient or Standard Beta), outer model (Cross Loadings) and dependent construct (R2).

Discussion

The results demonstrated that all TAM and UGT factors were significant. Most of the factors influenced students' motivation to use ChatGPT to learning in constructivist classes, excluding ACT factor. PU was the most influencing factor. This is supported by Hussain

Hypothesis	Relation	Original sample (O)	Standard deviation (STDEV)	*T*-statistics (|O/STDEV|)	*p*-values	*R*-square	f-square
H1	PEOU → ITU	0.229	0.048	4,728	0	0.504	0.116
H2	PU → ITU	0.338	0.052	6,492	0		0.287
H3	PEOU → PU	0.571	0.059	9,737	0		0.484
H4	ACT → ITU	0.03	0.032	0.958	0.338		0.004
H5	IS → ITU	0.236	0.053	4,485	0		0.116
H6	N → ITU	0.247	0.051	4,864	0		0.107

Table 4.
Hypothesis testing

Note(s): T > 1.95, ***p < 0.001, **p < 0.01
Source(s): By authors

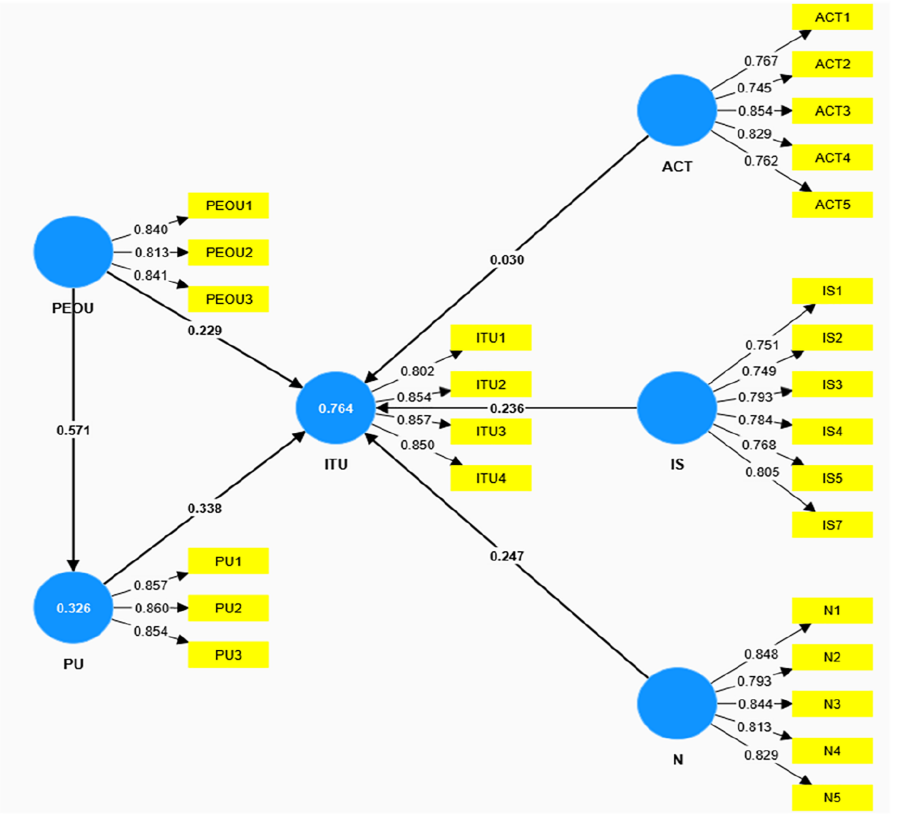

Figure 2.
Measurement and structural model

Source(s): By authors

et al. (2019). It means that students typically accept ChatGPT like virtual assistants if they think ChatGPT is beneficial.

Secondly, ACT factor does not impact ITU. The result is contradictory to the previous study (Chan *et al.*, 2023). It may be conducted further research to bridge the gap in the future. Moreover, the computed R2 value indicated that the model had a high degree of predictive accuracy by combining the impacts of independent variables (TAM and UGT components) on the dependent variable (ITU) (Hair *et al.*, 2017). Therefore, PEOU, PU, N, and IS determined the students' motivation to use ChatGPT for study in constructivist classrooms. Finally, the measured items matched the anticipated scope of the assessment. Because each item's loading value was more than 0.708, each variable could account for at least 50% of the variance for that particular item (Hair *et al.*, 2017). Therefore, there are 21 items that can be used as instruments to study motivation to use ChatGPT to study, while 5 items of ACT could be further examined.

Conclusion

Using the extended model, we investigated factors influencing students' intentions to use ChatGPT. It integrates three motive factors of the UGT (ACT, IS, and N) with the core constructs of TAM (PeoU and PE). The results of the extended framework suggest that PeoU and PE and IS and N have an association with ITU in the context of new technology like ChatGPT in an education setting with constructivist approaches.

To the best of our knowledge, this is one of the first study that integrates ACT, N, IS in the context of ChatGPT and education. Moreover, this current study is one of the first research examining the novelty value of Vietnamese students during the time that ChatGPT just was released in this country. The study contributes to the existing AI chatbot literature in the educational industry in several ways. This study addresses a gap in the literature by investigating the factors that influence students' ITU ChatGPT for educational purposes in Vietnam. This study offers policymakers, constructivist education service providers, and chatbot-based service providers in general as well as in Vietnam several noteworthy practical consequences by illuminating the key factors that drive ITU among youth. The findings will assist service providers and legislators in determining critical variables and influencing students' incentives to use ChatGPT in educational settings that use constructivist teaching methods. As a result, the information will assist service providers in creating AI chatbots that are more user-friendly, visually appealing, efficient, safe, and convenient for education. Governments, in conjunction with service providers, have the potential to significantly accelerate the adoption of AI-based chatbots by highlighting their ethical and sustainable use. It is recommended that service providers emphasize the advantages and ease of use of AI chatbots to draw new clients. Additionally, to promote ChatGPT or related technologies, marketers should concentrate on raising the technology's perceived novelty value. This is because people are open to new technologies if they believe they are interesting and innovative.

Although the research provides significant implications for practice, it has multiple limitations that show potential research gaps could be filled by conducting future research. First, only Vietnamese students make up the research sample. To increase the relevance of the findings, it is advised that future research look at the study model in various geographic regions. Second, the present investigation's constraints arise from the lack of clarity about the Chat GPT version utilised by the respondents, specifically whether it was the free or premium edition. Furthermore, the limited duration of the survey presents an obstacle to gathering thorough data. Due to their reliance on the particular features and functionalities of the Chat GPT version used, these restrictions may affect the research's objectivity. Furthermore, the limited survey time may curtail the coverage of the collected answers, particularly considering

that our survey predominantly focuses on business administration students, thus limiting the diversity and richness of the gathered data. We recommend that future studies should conduct comparative research between different versions of GPT Chat, including free and paid variants that can provide valuable insights into potential differences in performance and results. Such analysis can provide a deeper understanding of the strengths and limitations of different GPT Chat versions. Third, the study investigated behavioural intention; thus, the findings may not apply to actual usage and post-usage behaviour. We recommend research on users' usage and post-usage behaviour so as to comprehend their actual behaviour more deeply. The researchers have not yet considered moderator variables such as truth, age, gender and e-word of mouth. In future research, the scope of the survey should be expanded to include a heterogeneous group of participants, thereby ensuring representativeness across various demographic categories. This approach will promote a deeper understanding of how different demographic groups interact with and perceive technology. Finally, the study excluded any mediation analysis. Therefore, future studies could be undertaken by considering relevant mediating effects. Testing moderation and mediation provide insights that help marketers customise their marketing strategies effectively.

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Appendix

Measurement items:

TAM Theory (PEoU – Perceived Ease of Use):

PEoU1: I would find using GPT Chat for learning flexible and easy.

PEoU2: Getting information through text, images, and videos on GPT Chat is easy for me.

PEoU3: I find it easy to read information on GPT Chat on my phone, tablet, etc.

Perceived Usefulness (PU):

PU1: GPT Chat helps me acquire information faster than traditional media.

PU2: GPT Chat technology has enriched my learning experience.

PU3: With a good Wi-Fi or internet connection, I can access information from GPT Chat wherever I want.

Academic Content Creation (ACT):

ACT1: I use ChatGPT to write my assignments.

ACT2: I use ChatGPT to prepare presentations for my seminars.

ACT3: I use ChatGPT to write research papers.

ACT4: I prefer ChatGPT for writing theses/essays/projects.

ACT5: I use ChatGPT to summarize various topics.

ACT6: I use ChatGPT for daily study note-taking.

Information Seeking (IS):

IS1: I use ChatGPT to receive information on a topic.

IS2: I use ChatGPT to gather information for personal development and learning.

IS3: I use ChatGPT to verify or cross-check information.

IS4: I use ChatGPT to obtain additional course-related information.

IS5: I use ChatGPT to understand various topics better.

IS6: I use ChatGPT for exam preparation.

IS7: I use ChatGPT to gather information for planning and decision-making.

Novelty (N):

N1: I use ChatGPT because it offers novelty.

N2: I use ChatGPT because it's new.

N3: I use ChatGPT because it's unique.

N4: I use ChatGPT because of the initial hype on social media.

N5: I use ChatGPT because I want to explore recent trends.

N6: I use ChatGPT because I want to explore new possibilities for AI.

Intention to Use (ITU):

ITU1: I plan to use GPT Chat to read news in the future.

ITU2: I predict that I will use GPT Chat extensively to read news.

ITU3: I will always enjoy using GPT Chat to read news.

ITU4: I will recommend others to use GPT Chat to read news.

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