Unleashing the power of perceived enjoyment: exploring Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning

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Abstract

Purpose – This study intends to extend the unified theory of acceptance and use of technology (UTAUT) model by integrating perceived enjoyment as an intrinsic motivation so as to investigate factors influencing Chinese undergraduate English as a Foreign Language (EFL) students’ intention to use ChatGPT for English learning.

Design/methodology/approach – A cross-sectional quantitative survey method research design was used in this study. Data were collected from 432 undergraduate students at two Chinese universities. The data analysis was carried out using SmartPLS 4, a computer software that employs the partial least squares structural equation modelling (PLS-SEM) technique. The analysis of the model was performed in two stages, including the assessment of reflective measurement model and structural model. The PLS predict was utilized to assess the model’s predicting power.

Findings – Findings showed that effort expectancy, performance expectancy, social influence and perceived enjoyment were positively related to Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning. Perceived enjoyment mediated the relationships between effort expectancy, performance expectancy, social influence and intention to use ChatGPT for English learning respectively.

Originality/value – Through incorporating the perceived enjoyment as an intrinsic motivation into the UTAUT model to explore factors that impact Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning, this study has extended the applicability of the UTAUT model and provide insights into factors affecting students’ intention to utilize ChatGPT or other AI-based technologies for English learning.

Keywords ChatGPT, EFL learners, Perceived enjoyment, UTAUT model

Paper type Research paper

Introduction

As an advanced artificial intelligence (AI)-powered chatbot, ChatGPT has gained increasing attention in various sectors of contemporary life particularly in education. In the field of English learning, the growing interest of using ChatGPT can be attributed to its potential in nurturing learners’ language skills, acting as a supportive and interactive tool that provides constructive feedback on students’ language use.

Notably, opportunities to use English beyond the classroom are restricted in many English as a Foreign Language (EFL) contexts, including China (Liu et al., 2021). Even at universities, the prevalent emphasis on exam-oriented English learning tends to overwhelm learners’ entire language acquisition process. Thus Chinese EFL learners frequently encounter language activities that fail to align with real-life English use circumstances.

Although ChatGPT is equipped with interactive and potential features for language learning, it remains a fresh application for Chinese undergraduate students. According to Liu (2023), Chinese abroad students are increasingly using ChatGPT for their English learning, especially improving their English writing, reading and cross-cultural
communication skills. However, the extent to which undergraduate students studying within China intend to utilize ChatGPT for their English learning is underexplored. In this regard, the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. (2003) has gained widespread recognition as a model for explaining individuals’ acceptance and adoption of technology. The UTAUT model depicted four fundamental components that impact users’ intentions to utilize or actual use of a certain technology: effort expectancy, performance expectancy, social influence and facilitating conditions. Nonetheless, grounding on self-determination theory (Deci and Ryan, 1985), it is worth noting that these four components are classified as extrinsic motivation. As a result, this paradigm overlooks the importance of intrinsic motivation, such as perceived enjoyment, in affecting individuals’ attitudes and behaviors toward technology use.

Perceived enjoyment is the degree to which people believe they can get pleasure from utilizing a certain technology and expect positive consequences from their interactions (Davis et al., 1992). It impacts the acceptance and adoption of new technologies as an intrinsic drive (Collier and Barnes, 2015; Davis et al., 1992). Given that ChatGPT is a new AI-based tool in the sphere of education, EFL learners’ intention to utilize it may also be connected to their Perceived enjoyment.

While many studies have been conducted to investigate technology acceptance and usage in English learning, most of them have focused on the UTAUT model without incorporating intrinsic motivation as a contributing factor (e.g. Agyei and Razi, 2022). To fill the research gap and get a more comprehensive understanding of Chinese EFL learners’ intention of using ChatGPT for their English learning, this current study aims to address the following questions.

1. Are there any direct relationships between effort expectancy, performance expectancy, social influence, perceived enjoyment and Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning, respectively?

2. Does Perceived enjoyment mediate the relationship between Chinese undergraduate EFL learners’ effort expectancy and their intention to use ChatGPT for English learning?

3. Does Perceived enjoyment mediate the relationship between Chinese undergraduate EFL learners’ performance expectancy and their intention to use ChatGPT for English learning?

4. Does Perceived enjoyment mediate the relationship between Chinese undergraduate EFL learners’ social influence and their intention to use ChatGPT for English learning?

Identifying perceived enjoyment as a determinant of intention to use ChatGPT highlights the importance of designing user-friendly and engaging interfaces. Practically, this insight can guide developers in creating AI-based language learning tools that prioritize user satisfaction and enjoyment, thereby enhancing the overall learning experience. Moreover, this study contributes to the theoretical advancement of the UTAUT model by extending it to incorporate perceived enjoyment. This extension enhances the model's applicability in diverse contexts, providing a more nuanced understanding of technology adoption behavior. Besides, this study sheds light on the role of intrinsic motivation in technology adoption. This insight contributes to the broader literature on motivation theory by demonstrating its relevance in the context of adopting AI-based educational technologies.
Conceptual grounding and hypothesis development
The UTAUT model has been demonstrated to be an effective model to investigate factors influencing EFL students’ behavioral intention to using technological tools for their English learning (Tan, 2013). Therefore, the UTAUT model was used to investigate EFL learners’ intention to use ChatGPT for their English learning in this study.

ChatGPT for English learning
ChatGPT has emerged as a tool for English learning with huge potentials, such as improving the English ability of EFL learners through interactive and genuine learning settings (Vera, 2023) and promoting learner autonomy (Agustini, 2023). As a result, incorporating ChatGPT into English learning environments offers new opportunities for effective and personalized language learning experiences.

Concept of EFL learners’ intention to use ChatGPT for English learning
EFL learners’ intention to use ChatGPT for English learning refers to the understanding of factors that influence EFL learners’ willingness or desire to utilize the AI-powered chatbot as a tool to assist them in their English language learning journey. Since the intention to use a new technology influences the actual usage (Davis, 1989), EFL learners’ intention to use ChatGPT for English learning is critical in assessing whether learners would embrace and actively use the chatbot for their English learning. However, existing studies in education are largely concerned with the opportunities and challenges of employing ChatGPT. There is a scarcity of studies on students’ intentions to use it for English learning, particularly in the Chinese context.

Concept of effort expectancy, performance expectancy, social influence and perceived enjoyment
The UTAUT model was established by Venkatesh et al. (2003), which has increased in popularity for examining the acceptance and utilisation of various technologies. To thoroughly investigate factors influencing Chinese undergraduate EFL students’ intention to use ChatGPT for English learning, this study extends the UTAUT model, integrating Perceived enjoyment as an intrinsic motivation.

Effort expectancy is concerned with users’ perceptions of the ease of use and the perceived degree of effort necessary to utilize technology (Venkatesh et al., 2003). In this study, Effort expectancy refers to students’ judgment of how simple it is to utilize ChatGPT. Performance expectancy is the degree to which individuals believe that using a certain technology would improve their performance and assist them in achieving desired objectives (Venkatesh et al., 2003). It is defined in this study as EFL students’ judgment of the utility and efficacy of utilizing ChatGPT for English learning in educational activities. The impact of social variables on individuals’ technology adoption and usage is referred to as Social influence (Venkatesh et al., 2003). For this study, social influence is defined as students’ reported belief about how much support they receive from important individuals for using ChatGPT for English learning.

Perceived enjoyment refers to the degree to which individuals believe they will experience pleasure when interacting with a certain technology and expect favorable consequences (Davis et al., 1992). In this study, Perceived enjoyment refers to the expected pleasure and enjoyment that participants expect to get from their interactions with ChatGPT in their English learning, as well as their positive result expectations from utilizing the technology.
In higher education contexts, although there has been little research on EFL learners’ intentions to use ChatGPT for English learning, there are many recent studies reporting that effort expectancy, performance expectancy and social influence had significant influence on students’ intention to use ChatGPT for learning (Strzelecki, 2023; Habibi et al., 2023).

The studies conducted by Menon and Shilpa (2023) using the UTAUT framework sheds light on the influential role of effort expectancy in shaping individuals’ intention to use ChatGPT. Their qualitative findings underscore how factors such as ease of use, time-saving benefits, efficient user interface and personalized responses contribute to a positive effort expectancy, thereby impacting users’ intentions across various activities. However, it’s crucial to recognize the study’s broad scope, as its applicability to educational contexts remains uncertain, given the unique dynamics and challenges present in such environments.

Similarly, Strzelecki’s (2023) study emphasizes the significance of performance expectancy in predicting Polish university students’ intention to use ChatGPT. While this underscores the importance of belief in the technology’s effectiveness, the study lacks specific insights into various student groups, such as undergraduates, who constitute a significant demographic in countries like China. On the other hand, Habibi et al. (2023) highlight the role of Social influence in Indonesian higher education settings, suggesting its potential impact on students’ intention to utilize ChatGPT. Given the Asian cultural similarities in valuing others’ perspectives between Indonesia and China, it’s plausible to assume a similar influence on Chinese undergraduate students.

Moreover, while direct research on the relationship between Perceived motivation and ChatGPT usage among EFL students is limited, studies by Huang et al. (2024) and Ahn (2021) suggest the importance of Perceived enjoyment in shaping individuals’ willingness to adopt AI-based technologies, particularly for English learning. Considering the increasing integration of ChatGPT in education, perceived enjoyment emerges as a critical factor in forecasting students’ intention to incorporate this technology into their language learning endeavors.

Overall, these studies underscore the multifaceted nature of factors influencing individuals’ intention to use ChatGPT, while also highlighting the need for further research, especially in diverse educational contexts, to better understand its adoption dynamics. Therefore, based on the existing studies and connections, this study postulates the following four hypotheses.

**H1.** Effort expectancy is positively related to Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning.

**H2.** Performance expectancy is positively related to Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning.

**H3.** Social influence is positively related to Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning.

**H4.** Perceived enjoyment is positively related to Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning.

**Perceived enjoyment as a mediator**

Previous research has provided limited investigation into the mediating role of perceived enjoyment concerning effort expectancy and performance expectancy on students’ intention to use ChatGPT for English learning. However, existing studies hint at the potential for these relationships. For instance, Nur and Panggabean (2021) identified a significant positive effect.
of Perceived enjoyment on behavioral intention, suggesting that students are more inclined to use a technology when they find it enjoyable.

Effort expectancy, a concept derived from perceived ease of use in the technology acceptance model (TAM), refers to the degree to which users perceive utilizing an information system as effortless (Davis, 1989). According to Van der Heijden (2003), perceived ease of use significantly influences Perceived enjoyment, indicating that users are more likely to enjoy using a technology if they perceive it as easy to use.

Similarly, performance expectancy, analogous to perceived usefulness (Davis, 1989), concerns how individuals perceive the usefulness of a technology in enhancing their work performance. Zhou and Feng (2017) found that perceived usefulness strongly influences Perceived enjoyment, suggesting that the more useful a technology is perceived to be, the more enjoyment users derive from its use.

Furthermore, Joe et al. (2022) discovered that perceived enjoyment mediated the relationship between social influence and behavioral intention. While not directly related to education, this study offers valuable insights into the mediating role of Perceived enjoyment in technology use contexts.

Drawing from these studies, it is speculated that perceived enjoyment may act as a mediator between effort expectancy, performance expectancy, social influence and students’ intention to use ChatGPT. Thus, the current study seeks to investigate on these potential mediating relationships in the specific context of ChatGPT adoption for English learning. Hypotheses 5 to 7 are postulated as follows.

**H5.** Perceived enjoyment mediates the relationship between effort expectancy and Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning.

**H6.** Perceived enjoyment mediates the relationship between performance expectancy and Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning.

**H7.** Perceived enjoyment mediates the relationship between social influence and Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning.

The hypothesized research model is illustrated in Figure 1.

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**Figure 1.** The hypothesized research model

_Source(s):_ Authors’ own work
Method

Sample

A cross-sectional quantitative survey method research design was used in this study. The study focused on first- and second-year Chinese undergraduate students as the targeted population because undergraduate students are generally familiar with digital tools, and English courses are mandatory for undergraduates in their first two academic years in China (Chen et al., 2020). Their interests and needs made them as a suitable population for investigating the use of emerging technologies like ChatGPT in English language learning.

To ensure representativeness, the participants were university undergraduate students from two universities in both Northern and Southern China. A sample size of at 400 to 500 are considered sufficient (Boomsma, 1985; Comrey and Lee, 2013). This study has distributed 250 online questionnaires to each selected university. The convenience technique was used because of its accessibility and proximity. According to the calculation through G*Power, a powerful statistical tool frequently preferred by social science researchers for determining sample size (Hair et al., 2021), the minimum sample size was 110 for this study to get the power of 0.95 and effect size of 0.10. Thus, the sample size of 432 of this study significantly surpassed the minimum sample size, demonstrating its sufficiency for data analysis.

Instruments

This study adapted Venkatesh and Zhang’s (2010) scale to measure students’ intention to use ChatGPT for English learning with its three dimensions: effort expectancy (5 items), performance expectancy (5 items) and social influence (4 items). The scale for perceived enjoyment (4 items) was adapted from Lisana (2023). Participants were asked to score the items on a seven-point Likert scale ranging from 1 being strongly disagree and 7 being strongly agree. A forward translation technique (Brislin, 1970) was used for the questionnaire translation.

Data collection

At the preliminary stage, a pilot study was undertaken in June 2023, comprising 224 participants who were first- and second-year undergraduate students. These individuals were not involved in the subsequent main study. The Cronbach’s alpha values of effort expectancy, performance expectancy, social influence, perceived enjoyment and Chinese undergraduate EFL Learners’ intention to use ChatGPT for English learning were 0.906, 0.875, 0.848, 0.811 and 0.830 respectively, indicating a strong internal consistency within the measurement scales, thereby lending credibility to the instrument used.

In the subsequent main study, upon consent from the two selected universities authorities, the sample responded to the online questionnaires through Wenjuanxing (www.wjx.cn), a widely utilized online survey platform in China for data collection. The purpose of the study was stated on the cover page of the online questionnaire. All the participants were assured that their responses were confidential and their personal information was strictly protected.

Data analysis

The total completed questionnaire was 432, with a response rate of 86.4%. The number of male and female participants are almost equal with male 217 (50.2%) and female 215 (49.8%). The Cronbach’s alpha values of effort expectancy, performance expectancy, social influence, perceived enjoyment and Chinese undergraduate EFL Learners’ intention to use ChatGPT for English learning were 0.910, 0.872, 0.845, 0.804 and 0.844 respectively, indicating strong internal consistency within each variable.
The data analysis was carried out using SmartPLS 4, a computer software that employs the partial least squares structural equation modelling (PLS-SEM) technique (Ringle et al., 2015). PLS-SEM was chosen as it is suitable for examining the proposed relationships between latent variables, especially well-suited for smaller sample sizes, and does not rely on assumptions about the distribution of the data (Hair et al., 2021). The analysis of the model was performed in two stages, including the assessment of reflective measurement model and structural model (Ringle et al., 2015).

The assessment of measurement model investigates convergent and discriminant validity. Convergent validity was established if the parameter estimates: (1) indicator reliability (loading value) of 0.70 or higher, (2) composite reliability (CR) of 0.70 or higher and (3) average variance extracted (AVE) of 0.50 (Hair et al., 2021). Meanwhile, discriminant validity was established if the heterotrait-monotrait ratio of correlation (HTMT), the average item correlations among variables compared to the average correlations of the items assessing the same variable, lower than the cutoff value of 0.90 (Henseler et al., 2015).

Next, the structural model was assessed using the bootstrapping procedure. This study used 10,000 subsamples with replacement from the original sample to obtain estimated $t$ values for structural path significance testing (Hair et al., 2021). The analysis focused on path coefficients ($\beta$), variance explained ($R^2$), and effect size ($f^2$) (Thien and Chan, 2022). This study employed Preacher and Hayes’s (2008) guideline to examine the mediating effects. Bootstrap resampling was used to estimate the distribution of the indirect effect for both simple and multiple mediator models (Hair et al., 2013). Besides, model fit testing is important to reveal the accuracy of a model in predicting the connections between variables, as well as its potential for effective application or generalization to the full research population (Kline and Tamer, 2016). Following this, the PLS Predict was utilized to assess the model’s predicting power (Shmueli et al., 2019).

Results
This study has collected the data from a single source which could potentially lead to the presence of common method bias (Podsakoff et al., 2003). Thus, common method bias was assessed through a full collinearity test, incorporating both vertical and lateral collinearity assessments as suggested by Kock and Lynn (2012). Vertical collinearity was measured using outer VIF values, while lateral collinearity was determined through inner VIF values. As shown in Tables 1 and 3, all obtained outer and inner VIF values were under 3, indicating no common method bias in this study (Thien and Jamil, 2020).

The data cleaning was then performed to ensure the quality of the dataset (Tabachnick et al., 2013). Results showed that no outliers were discovered in the dataset. Although multivariate normality is not a major concern in partial least square structural equation modelling (PLS-SEM) because of its non-parametric nature (Hair et al., 2013), Peng and Lai (2012) advise against making broad generalizations regarding PLS’s ability to estimate a model as the possibility of violation of the multivariate normality criteria. Thus, the WebPower (https://webpower.psychstat.org/models/kurtosis/) was utilized in this study to assess multivariate skewness and kurtosis (Cain et al., 2017). The results showed that the data was not multivariate normal with Mardia’s multivariate skewness ($\beta_5 = 2.588, p < 0.01$) and Mardia’s multivariate kurtosis ($\beta_5 = 48.163, p < 0.01$). The findings suggested that path coefficients, the standard errors, $t$ values and $p$ values for the structural model using a 10,000-sample re-sample bootstrapping procedure need to be reported (Becker et al., 2023).

The mean values of each variable are above the average based on the 7-point Likert scale (EE: $M = 4.572, SD = 1.424$; PE: $M = 4.363, SD = 1.291$; SI: $M = 4.372, SD = 1.325$; PEJ: $M = 4.477, SD = 1.279$; IUC: $M = 4.411, SD = 1.242$). The descriptive statistics revealed
significant variability in students’ responses, as evidenced by the high standard deviations of the items of each variable.

Assessment of measurement model
Table 1 shows that all the items with each respective variable are above the threshold value of 0.70, indicating satisfactory indicator reliability. The AVE of the five variables exceeds the threshold of 0.50. The value of CR of each variable was above the threshold of 0.70. Hence, convergent validity was established.

Table 2 shows that the HTMT values for the variables are less than 0.90 (HTMT.90). Therefore, discriminant validity of the variables was established.

Table 1. Assessment of the measurement model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Alpha</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE1</td>
<td>0.910</td>
<td>0.933</td>
<td>0.734</td>
</tr>
<tr>
<td>EE2</td>
<td>0.933</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE3</td>
<td>0.865</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE4</td>
<td>0.799</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE5</td>
<td>0.834</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived enjoyment (PEJ)</td>
<td>0.816</td>
<td>0.891</td>
<td>0.731</td>
</tr>
<tr>
<td>PEJ2</td>
<td>0.853</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEJ3</td>
<td>0.858</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEJ4</td>
<td>0.854</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance expectancy (PE)</td>
<td>0.872</td>
<td>0.907</td>
<td>0.662</td>
</tr>
<tr>
<td>PE1</td>
<td>0.810</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE2</td>
<td>0.809</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE3</td>
<td>0.799</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE4</td>
<td>0.834</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE5</td>
<td>0.815</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social influence (SI)</td>
<td>0.845</td>
<td>0.896</td>
<td>0.682</td>
</tr>
<tr>
<td>SI1</td>
<td>0.847</td>
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<td></td>
</tr>
<tr>
<td>SI2</td>
<td>0.837</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI3</td>
<td>0.800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI4</td>
<td>0.820</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to use ChatGPT for English learning (IUC)</td>
<td>0.841</td>
<td>0.893</td>
<td>0.677</td>
</tr>
<tr>
<td>IUC2</td>
<td>0.819</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IUC3</td>
<td>0.822</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IUC4</td>
<td>0.835</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IUC5</td>
<td>0.814</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source(s): Authors’ own work

Table 2. Results of discriminant validity (HTMT.90)

<table>
<thead>
<tr>
<th>Variable</th>
<th>EE</th>
<th>IUC</th>
<th>PE</th>
<th>PEJ</th>
<th>SI</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE</td>
<td></td>
<td></td>
<td>0.705</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IUC</td>
<td>0.705</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE</td>
<td>0.688</td>
<td>0.688</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEJ</td>
<td>0.683</td>
<td>0.791</td>
<td>0.682</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI</td>
<td>0.662</td>
<td>0.708</td>
<td>0.699</td>
<td>0.703</td>
<td></td>
</tr>
</tbody>
</table>

Source(s): Authors’ own work
Assessment of structural model

Table 3 shows a significant positive relationship between effort expectancy and intention to use ChatGPT for English learning ($\beta = 0.218, t = 3.923, p = <0.001$), performance expectancy and intention to use ChatGPT for English learning ($\beta = 0.122, t = 2.390, p = 0.017$), social influence and intention to use ChatGPT for English learning ($\beta = 0.180, t = 3.414, p < 0.001$), perceived enjoyment and intention to use ChatGPT for English learning ($\beta = 0.319, t = 5.880, p < 0.001$), respectively. Additionally, the confidence interval corrected bias contains no zero values, indicating the significant relationship between the variables. Thus, H1–H4 were supported.

The effect size ($f^2$) provides an indication of the strength of the impact of independent variable on the dependent variable (Intention to use ChatGPT for English learning). The threshold of 0.02, 0.15 and 0.35 denoting small, moderate and substantial impacts, respectively (Cohen, 1988). Table 3 depicts that perceived enjoyment has a relatively moderate impact on Intention to use ChatGPT for English learning ($f^2 = 0.138$). In contrast, effort expectancy, performance expectancy and social influence have small impact on intention to use ChatGPT for English learning.

Table 3 shows that there is a significant indirect effect of effort expectancy on intention to use ChatGPT for English learning ($\beta = 0.090, t = 3.449, p = 0.001$). The Bootstrapping CI Bias Corrected [0.044, 0.148] for H5 does not contain a zero, indicating there is a significant mediation effect of perceived enjoyment in the relationship between effort expectancy and intention to use ChatGPT for English learning (Preacher and Hayes, 2008). Therefore, H5 was supported. There is a significant indirect effect of Perceived enjoyment in the relationship between performance expectancy and intention to use ChatGPT for English learning ($\beta = 0.074, t = 2.739, p = 0.006$). The Bootstrapping CI Bias Corrected for H6 do not contain a zero, further indicating there is a significant mediation effect of perceived enjoyment in the relationship between performance expectancy and intention to use ChatGPT for English learning (Preacher and Hayes, 2008). Thus, H6 was supported. Similarly, there is a significant indirect effect of Perceived enjoyment in the relationship between social influence and intention to use ChatGPT for English learning ($\beta = 0.089, t = 3.613, p < 0.001$). Hence, H7 was supported. Figure 2 illustrated effort expectancy, performance expectancy, social influence and perceived enjoyment contributed about 55% of variance explained on intention to use ChatGPT for English learning.

Table 4 presents the outcomes of the PLS-predict analysis, which evaluates the model’s predictive capabilities. The $Q^2$ predict values exceed 0. The PLS-SEM_RMSE and LM_RMSE to be compared to assess the model’s predictive power (Shmueli et al., 2019). The results indicate that all indicators in PLS-SEM_RMSE are lower than those in LM_RMSE, implying that the model exhibits a high predictive power (Shmueli et al., 2019). The high

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\beta$</th>
<th>SD</th>
<th>$t$ value</th>
<th>$p$ value</th>
<th>2.5% CI</th>
<th>97.5% CI</th>
<th>$f^2$</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: EE $\rightarrow$ IUC</td>
<td>0.218</td>
<td>0.056</td>
<td>3.923</td>
<td>$&lt;0.001$</td>
<td>0.107</td>
<td>0.325</td>
<td>0.061</td>
<td>Supported</td>
</tr>
<tr>
<td>H2: PE $\rightarrow$ IUC</td>
<td>0.122</td>
<td>0.051</td>
<td>2.390</td>
<td>0.017</td>
<td>0.024</td>
<td>0.224</td>
<td>0.019</td>
<td>Supported</td>
</tr>
<tr>
<td>H3: SI $\rightarrow$ IUC</td>
<td>0.180</td>
<td>0.053</td>
<td>3.414</td>
<td>0.001</td>
<td>0.080</td>
<td>0.286</td>
<td>0.043</td>
<td>Supported</td>
</tr>
<tr>
<td>H4: PEJ $\rightarrow$ IUC</td>
<td>0.319</td>
<td>0.054</td>
<td>5.880</td>
<td>$&lt;0.001$</td>
<td>0.212</td>
<td>0.426</td>
<td>0.138</td>
<td>Supported</td>
</tr>
<tr>
<td>H5: EE $\rightarrow$ PEJ $\rightarrow$ IUC</td>
<td>0.090</td>
<td>0.026</td>
<td>3.449</td>
<td>0.001</td>
<td>0.044</td>
<td>0.148</td>
<td>0.138</td>
<td>Supported</td>
</tr>
<tr>
<td>H6: PE $\rightarrow$ PEJ $\rightarrow$ IUC</td>
<td>0.074</td>
<td>0.027</td>
<td>2.739</td>
<td>0.006</td>
<td>0.027</td>
<td>0.134</td>
<td>0.138</td>
<td>Supported</td>
</tr>
<tr>
<td>H7: SI $\rightarrow$ PEJ $\rightarrow$ IUC</td>
<td>0.089</td>
<td>0.025</td>
<td>3.613</td>
<td>$&lt;0.001$</td>
<td>0.045</td>
<td>0.141</td>
<td>0.138</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Table 3. Results of the hypotheses

Source(s): Authors’ own work
predictive power is desirable as it indicates that the model is effective in capturing and explaining the relationships between variables, making it valuable for making accurate prediction or generalization in the study.

**Discussion**

This study aims to investigate the influence of the effort expectancy, performance expectancy, social influence and mediating role of perceived enjoyment on Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning. The current findings informed that perceived enjoyment was a significant mediator between effort expectancy, performance expectancy, social influence and intention to use ChatGPT. Effort expectancy, performance expectancy, social influence and perceived enjoyment have direct impacts on Intention to use ChatGPT for English learning.

The significant positive relationship between effort expectancy and intention to use ChatGPT for English learning was in line with Menon and Shilpa’s (2023) result that effort expectancy had direct influence on individuals’ intention to use ChatGPT. This finding further confirms that the effort expectancy is an important predictor for Chinese undergraduate EFL learners’ intention to use ChatGPT for their English learning, suggesting that the students are more likely to engage with the ChatGPT if they find it user-friendly or easy to use. This could provide insights for designing and developing

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Q2 predict</th>
<th>PLS-SEM_RMSE</th>
<th>LM_RMSE</th>
<th>Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>IUC2</td>
<td>0.349</td>
<td>1.297</td>
<td>1.308</td>
<td>−0.011</td>
</tr>
<tr>
<td>IUC3</td>
<td>0.333</td>
<td>1.288</td>
<td>1.317</td>
<td>−0.029</td>
</tr>
<tr>
<td>IUC4</td>
<td>0.356</td>
<td>1.263</td>
<td>1.286</td>
<td>−0.023</td>
</tr>
<tr>
<td>IUC5</td>
<td>0.268</td>
<td>1.370</td>
<td>1.407</td>
<td>−0.037</td>
</tr>
<tr>
<td>PEJ2</td>
<td>0.329</td>
<td>1.382</td>
<td>1.406</td>
<td>−0.024</td>
</tr>
<tr>
<td>PEJ3</td>
<td>0.340</td>
<td>1.283</td>
<td>1.311</td>
<td>−0.028</td>
</tr>
<tr>
<td>PEJ4</td>
<td>0.320</td>
<td>1.313</td>
<td>1.344</td>
<td>−0.031</td>
</tr>
</tbody>
</table>

*Note(s):* RMSE: root-mean-square-error. LM: linear model

*Source(s):* Authors’ own work
technologies with educational purposes, which should emphasize simplicity and ease of use to encourage learners’ intention to use them.

The significant positive relationship between performance expectancy and Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning supported the argument of Strzelecki (2023) that students’ behavioral intention to use ChatGPT for learning is directly influenced by performance expectancy. This finding indicates that the performance expectancy is an effective variable when investigating Chinese EFL learners’ intention to utilize ChatGPT for their English learning, implying that providing obvious learning usefulness may enhance students’ desire to use technological tools like ChatGPT.

It was discovered that social influence is positively associated to Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning, which is consistent with the findings of Habibi et al. (2023), who reported that social influence had a direct impact on students’ intention to utilize ChatGPT in their learning. This finding reveals that Social influence is likely an influential variable for determining Chinese EFL learners’ intention to utilize ChatGPT for English learning. Similar with the previous findings (Huang et al., 2024; Ahn, 2021), the positive relationship between perceived enjoyment and intention to use ChatGPT for English learning revealed that perceived enjoyment is a significant determinant of the behavioral intention. This finding implies that students who experience higher levels of perceived enjoyment are more likely to use ChatGPT for their English learning.

The significant mediating role of perceived enjoyment between effort expectancy and intention to use ChatGPT for English learning indicated that the perceived simplicity with which students can utilize ChatGPT could affect their satisfaction, which in turn influences their propensity to use the technology. Essentially, if an AI tool is regarded to be simple to use, it is more likely to be enjoyed, which improves the likelihood of using it. This chain of impact may imply that developers and educators should prioritize user-friendliness in their design to increase enjoyment and, as a result, adoption.

The mediating role of perceived enjoyment in the relationship between performance expectancy and intention to use ChatGPT for English learning suggests that the perception that utilizing ChatGPT would lead to increased performance increases how pleasurable the tool is seen to be, which then influences the intention to use it. Consistent with the speculation from previous studies (Nur and Panggabean, 2021; Van der Heijden, 2003; Zhou and Feng, 2017), this finding provides empirical evidence to support that perceived enjoyment is a mediator between performance expectancy and behavioral intention which could be expanded into the educational context. The finding informed AI tools like ChatGPT should not only give demonstrable performance gains but also provide an entertaining manner to promote adoption.

The fact that perceived enjoyment mediates the relationship between Social influence and Intention to use ChatGPT for English learning means peers’ or authorities’ opinions or actions influence how fun the technology is, affecting the desire to use it. This reaffirms Joe et al.’s (2022) finding that perceived enjoyment can mediate the relationship between social influence and technological users’ behavioral intention and further broaden the result into education. This finding suggests that social factors influence the intention to utilize the system directly and indirectly through influencing perceived enjoyment. Thus, the utilization of AI tools may benefit from using social networks or authority endorsements to increase both enjoyment and intention to use.

The inclusion of perceived enjoyment has affirmed the current study’s proposition regarding the significance role played by intrinsic motivation. This aligned with the results of Yang et al. (2023), who identified intrinsic motivation as a mediating factor in university students’ intention in blended learning – another form of technology-based learning. The finding has further reinforced the notion that intrinsic motivation should be considered when identifying the factors that influence usage intentions (Davis et al., 1992; Venkatesh, 1999).
The effect size indicates that perceived enjoyment has a stronger impact on Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning compared to effort expectancy, performance expectancy and social influence. The finding suggests that the importance of considering perceived enjoyment when designing educational interventions involving ChatGPT. This is consistent with the argument of Mubuke et al. (2017) where individuals who perceive they are likely to experience enjoyment from using a technology have more likelihood to intend to utilize it extensively than those who have no such perceptions.

The findings above revealed that perceived enjoyment plays a more significant role in influencing intention to use ChatGPT for English learning in the Chinese university context. These findings could be explained by the exam-oriented learning environment in Chinese university. University students in China are often heavily focused on preparing for various examinations and tests. For most of the students, passing the College English Exam (CET) is a prerequisite and necessary requirement for obtaining their diplomas or degrees. This examination-centric environment creates a high-pressure atmosphere for Chinese students (Zhang et al., 2022). Consequently, students may seek activities with more enjoyment and pleasure to counterbalance this pressure. In such a stress-inducing academic environment, the appeal of perceived enjoyment becomes more pronounced, leading to its stronger influence on students’ intention to use ChatGPT for their English learning.

**Conclusion**
As an emerging artificial tool, ChatGPT has gained increasing momentum in educational contexts. By incorporating the perceived enjoyment as an intrinsic motivation into the UTAUT model, the study reaffirms that the UTAUT model is an effective theoretical framework to identify behavioral intentions in terms of technology use and shows that the perceived enjoyment plays a mediating role in Chinese undergraduate EFL learners’ intention to use ChatGPT, providing implications for English teaching and learning both in theory and practice.

**Limitations and future studies**
This study has some limitations. First, the study has only involved undergraduate students from two Chinese universities. This limitation may restrict the findings’ representativeness and generalizability. Hence, future research could include a larger spectrum of participants. Second, the effects of demographic factors, such as gender and university program have not been considered in this study. Future studies could include more demographic factors. Besides, the current findings could be further investigated by employing qualitative interviews or observations method to acquire more in-depth insights. The 45% of unexplained variance on Chinese undergraduate EFL learners’ intention to use ChatGPT for English Learning has suggested that other influencing factors also need to be taken into consideration. These potential factors, including learning habits, curiosity, perceived ease of use and expectation of academic achievement are also playing important roles in shaping students’ usage intention regarding technology-based learning (Arpaci et al., 2023).

In conclusion, the study extends the UTAUT model with perceived enjoyment, and complements prior research on Chinese undergraduate EFL learners’ intention to use ChatGPT for English learning. The results confirm that the effort expectancy, performance expectancy and social influence have major impacts on individuals’ intention to use new technologies. The study also provides empirical support for including perceived enjoyment...
as an intrinsic motivation in technology adoption. The perceived enjoyment underlines the importance of individuals' pleasure and interests in deciding their intention to engage with a technology, adding to previous research and offering a more nuanced picture of the factors affecting technology acceptance.

**References**


Unleashing the power of perceived enjoyment

Further reading


About the authors
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