

Assessing the Acceptance and Utilization of ChatGPT by Chinese University Students in English Writing Education

Tongyao Ge

School of Foreign Studies, Wenzhou University, Wenzhou, China
Email: getongyao@gmail.com

Abstract—As an advanced large language model, ChatGPT has garnered significant attention from academic researchers and educators due to its capabilities in generating coherent natural-language responses based on user input, facilitating extended dialogues, and contextual comprehension. Numerous scholarly investigations delve into the merits and potential shortcomings of ChatGPT within educational contexts, emphasizing both the model's inherent attributes and the scarcity of end-user feedback. Furthermore, the Technology Acceptance Model and the Information System Success Model serve as prevalent frameworks in assessing user receptivity and satisfaction with novel technologies. This research employed an online questionnaire to probe Chinese university students' perceptions and adoption of ChatGPT in English writing instruction, assessing five distinct dimensions using a Likert scale. The findings suggest a favorable inclination among students towards ChatGPT concerning its utility and effectiveness. However, ChatGPT has yet to supplant the indispensable role of educators entirely, and apprehensions persist about potential privacy infringements and associated technological issues.

Keywords—ChatGPT, English writing teaching, technology acceptance model

I. INTRODUCTION

In the modern digital era, artificial intelligence has witnessed profound advancements. These recent developments have elevated chatbots as a potent tool for language acquisition. Specifically, chatGPT, the latest iteration of a natural-language system, was unveiled on 30 November 2022 [1]. This state-of-the-art language model offers users an authentic, human-like interactive experience, heralding transformative shifts in educational landscapes [2, 3]. Such advancements in natural language processing empower AI to assume a pivotal role in language instruction. Positioned as a dialogue generation system underpinned by vast data and intricate deep learning algorithms, ChatGPT has garnered significant accolades in the realm of natural language generation, offering a revolutionary methodology for English writing pedagogy.

In analyzing the acceptance and utilization of emerging technology for English writing instruction, the majority of scholars lean towards the Technology Acceptance Model (TAM) and the Information Systems Success Model. The TAM, conceived by Davis in 1989 and subsequently refined, aims to elucidate the determinants influencing computer acceptance across diverse end-user computing technologies and user demographics [4]. It is primarily anchored on two pivotal constructs: 'Perceived Usefulness', representing an individual's subjective assessment of the advantages brought by the adoption of new technologies, and 'Perceived Ease of Use', reflecting an individual's subjective estimation of the challenges associated with the utilization of these technologies. The TAM postulates that if end-users perceive a technology as beneficial and user-friendly, they are more inclined to embrace and implement it. Meanwhile, the Information Systems Success Model, introduced by DeLone and McLean in 1992, contends that the efficacy of information systems can be appraised through varied metrics such as information quality, system quality, service quality, usage intent, user contentment, and overall net efficiency [5].

For several decades, English has established itself as the preeminent scientific lingua franca [6]. Proficiency in English writing is instrumental in enhancing communication, fostering collaborations in professional, academic, and social arenas. Traditional methodologies for English writing instruction often necessitate students to hone their skills through extensive imitation, memorization, and task-oriented exercises. However, due to the limited resources and time constraints faced by educators, offering tailored guidance and individualized feedback often proves arduous. Furthermore, students regularly grapple with challenges related to lexical selection, grammatical constructs, and sentence structuring. Addressing these challenges mandates not only instructor-led interventions but also sustained student engagement and iterative interactions.

Numerous academicians have delved into extensive investigations concerning ChatGPT, especially within the realms of language generation and pedagogical applications. Some, such as Baidoo-Anu and Owusu Ansah, postulate that ChatGPT can craft unique scenarios prompting collaborative student problem-solving and

goal attainment [7]. The TESOL International Association posits that ChatGPT can spawn discussion prompts and ingenious writing cues, fostering student creativity [8]. Contrastingly, Bašić *et al.* [9], via a comparative study, deduced that the utility of ChatGPT-3 as a writing adjunct might be limited. Kohnke broached pivotal discussions centered around the ethical employment of ChatGPT in pedagogical contexts, the veracity of chatbot-generated responses, and the cultural biases embedded within foundational datasets and algorithms [10]. Bishop contends that while ChatGPT excels in procedural writing tasks, potentially surpassing human capabilities, it lags in intricate writing endeavors [11]. Additionally, Hong raises apprehensions regarding ChatGPT's potential in inadvertently stifling students' critical thinking and writing proficiencies [8].

The literature review elucidates that predominant research has concentrated on the outcomes ensuing from ChatGPT's deployment, encompassing both its merits and potential drawbacks. While ChatGPT has achieved significant advancements in language generation, its assimilation and reception within the educational sector remain under-explored. Specifically, there exists a research gap in gauging users' and target audiences' sentiments. In the context of English writing instruction, lingering uncertainties surround ChatGPT's efficacy and its embracement by learners. To address this, our study probes into Chinese university students' perceptions and utilization of ChatGPT in English writing. By incorporating the extended technology acceptance model and the information system success model, this research comprehensively investigates five facets: perceptual, acceptance of use, psychological, actual use effect, and technological dimensions. The aim is to furnish both theoretical insights and empirical substantiation for relevant pedagogical practices.

The remainder of the paper is organized as follows: the second section will present the research design and the methodology of the variables that influence the use and acceptance of ChatGPT in English writing. The third section will present the results of the study. The fourth section will discuss and analyze the results based on the variables. The fifth part will summarize the results of the study and provide directions and suggestions for further research.

II. METHODS

This paper presents a research endeavor examining university students' receptivity and application of ChatGPT in English writing pedagogy. Grounded in frameworks such as the TAM and the Information System Success Model, a questionnaire was constructed to gauge students' proclivity towards deploying ChatGPT within English writing courses and their sentiments following its use. The instrument is tripartite: (i) demographic details of the participants, (ii) exploration of determinants influencing students' adoption of ChatGPT, encompassing the cognitive, usage acceptance, and psychological facets, and (iii) probing factors impacting sentiments of those acquainted with ChatGPT or

analogous expansive language models, focusing on the practical effect and technical realms. As delineated in Table I, five variables with a collective twenty-three items ascertain the dynamics governing ChatGPT's utilization in English writing. Adopting a Likert scale, each item proffers five response alternatives. Structured declaratively, the responses range from "Strongly Agree" to "Strongly Disagree", scaled at 5 to 1, sequentially. A participant's disposition is reflected in the aggregate score across items, with the cumulative score signifying the magnitude of their stance or their respective position on the continuum.

TABLE I. MEASUREMENT SCALE AND DEPENDENT VARIABLE

Dimension	Question
Cognitive Dimension	Q1. You are familiar with ChatGPT or similar large language models.
	Q2. You think ChatGPT is an effective help for your English writing.
	Q3. You think that ChatGPT can effectively assist teachers in English writing teaching.
	Q4. You think that ChatGPT offers a different English writing learning experience compare to traditional teaching methods.
Use Acceptance Dimension	Q5. You are willing to try using ChatGPT to assist your English writing.
	Q6. You think using ChatGPT to write in English will ease the burden a lot.
	Q7. You think using ChatGPT can improve your English writing skills.
	Q8. You are expected to use ChatGPT in future learning.
Psychological Dimension	Q9. You think AI tools like ChatGPT can replace some of the teacher's work.
	Q10. You are not anxious or worried about using an AI tool such as ChatGPT to write in English is detrimental to educational fairness.
	Q11. You are not worried about over-reliance on AI tools like ChatGPT may affect your communication with teachers.
	Q12. You think using AI tools like ChatGPT improves your English writing skills more than interacting with teachers.
Use of the Actual Effect Dimension	Q13. Whether you've used ChatGPT or other language models.
	Q14. ChatGPT or other language models can help you gather and integrate topical information before you write.
	Q15. You think using ChatGPT or other language models is helpful in improving your vocabulary and grammatical accuracy.
	Q16. Using ChatGPT or other language models can help you find new innovations and ideas in English writing.
	Q17. Using ChatGPT or other language models can help you practice English writing more effectively.
Technical Dimension	Q18. You have encountered a lot of technical problems when using ChatGPT or other language models.
	Q19. You think the operating interface of ChatGPT or other language models is easy to understand and use.
	Q20. You don't feel like you need more technical support when using ChatGPT or other language models.
	Q21. You are not concerned about data or privacy breaches in the ChatGPT or other language models.

For this investigation, an online survey was administered over a span of five days, from July 9, 2023, to July 13, 2023. Within this timeframe, a total of 338 questionnaires were disseminated and subsequently retrieved. Before data analysis, questionnaires deemed invalid were excluded, yielding a dataset comprising 300 respondents, selected to ensure uniformity in response time and consistency in response quality.

III. RESULTS

Fig. 1 presents the demographic breakdown of respondents. Females constituted a slightly larger segment, with 178 participants (59.1%), compared to 122 males (40.7%). The academic classifications of respondents were fairly distributed: 63 freshmen (21%), 88 sophomores (29.3%), 87 juniors (29%), 35 seniors (11.7%), and 27 at the postgraduate level or higher (9%). This balanced representation aligns with the study's criteria, ensuring its representativeness.

Data analysis uses SPSS version 26 for statistical analysis. Table II provides descriptive results for five dimensions, including mean value, standard deviation, variance, bias, and peak. Since the bias and peak are both in the +2.0 and -2.0 range, the normality is inferred [12].

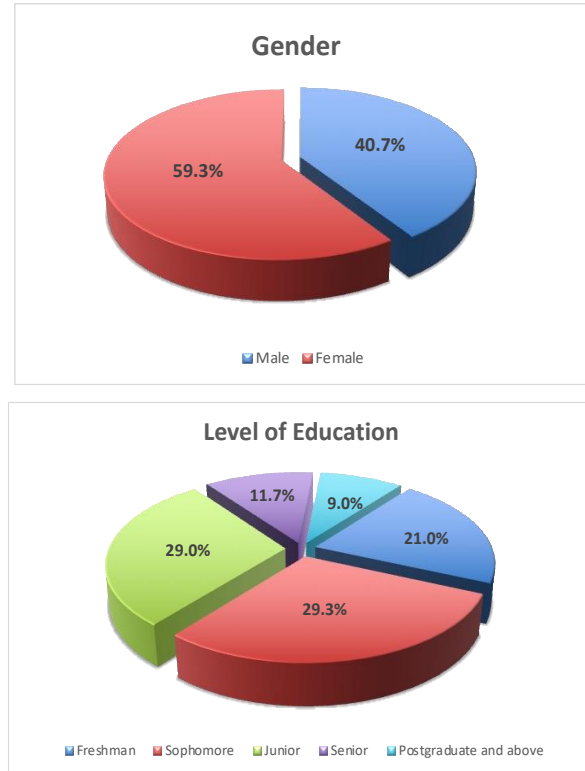


Fig. 1. Basic information on samples

TABLE II. DESCRIPTIVE STUDY OF FIVE DIMENSIONS

Dimension	Question	Mean(M)	Standard deviation (SD)	Variance	Peak	Bias
Cognitive Dimension	Q1	3.163	1.164	1.355	-0.593	-0.284
	Q2	3.750	0.896	0.804	-0.073	-0.356
	Q3	3.717	0.931	0.866	0.157	-0.560
	Q4	3.790	0.884	0.782	0.611	-0.628
Use Acceptance Dimension	Q5	3.867	0.867	0.751	0.302	-0.607
	Q6	3.897	0.880	0.775	0.184	-0.596
	Q7	3.553	1.015	1.031	-0.421	-0.329
	Q8	3.923	0.841	0.706	-0.157	-0.467
Psychological Dimension	Q9	3.403	1.076	1.158	-0.324	-0.372
	Q10	2.543	1.045	1.092	-0.411	0.309
	Q11	2.400	0.978	0.957	0.193	0.574
	Q12	2.370	0.900	0.809	-0.360	0.145
Use of the Actual Effect Dimension	Q14	3.947	0.833	0.694	0.987	-0.775
	Q15	3.834	0.877	0.770	-0.126	-0.472
	Q16	3.935	0.920	0.847	0.300	-0.751
	Q17	3.888	0.922	0.850	0.358	-0.788
Technical Dimension	Q18	2.645	1.043	1.087	-0.150	0.500
	Q19	3.822	0.819	0.671	0.174	-0.450
	Q20	2.130	0.821	0.673	-0.387	0.343
	Q21	2.148	0.911	0.829	-0.018	0.516

From Fig. 2, the average value for use acceptable dimension (M = 3.810, SD = 0.901) and use of actual effect dimensions (M = 3.901, SD = 0.888) have the highest mean values. Contrastingly, the psychological dimension (M = 2.679, SD = 1.000) and the technical dimension (M = 2.686, SD = 0.898) exhibit the least disparity. Notably, the minimum standard differences for use of actual effect dimension (M = 3.901 and SD = 0.888).

To assess the credibility and validity of the questionnaire, this study is evaluated using Cronbach's α

coefficient, Bartlett test, etc. Table III shows that the Cronbach's α coefficient is greater than 0.9, thus indicating a high degree of credibility of the study data [13]. A validity analysis requires Bartlett testing (p must be less than 0.05). From Table IV, the p value of 0.000 (< 0.005) and the KMO value of 0.924 (> 0.8), confirm the research data's appropriateness for factor extraction and underscores the questionnaire's robust reliability and validity.

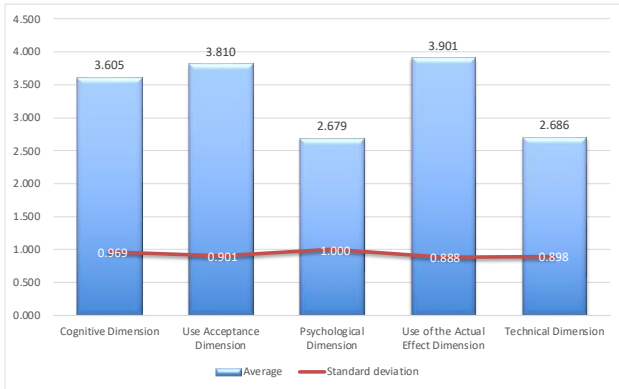


Fig. 2. Average and standard deviation of five dimensions.

TABLE III. RELIABILITY OF THE MODEL

Item number	Cronbach's α coefficient
23	0.928

TABLE IV. KMO TEST AND BARTLETT TEST

KMO value	0.924	
Bartlett spherical degree test	Approximate chi-square	2928.982
	df	153
	p value	0.000

IV. DISCUSSION

The five typical dimensions of this study will then be discussed: cognitive dimension, use acceptance dimension, psychological dimension, use of actual effect dimension, and technical dimension.

A. Cognitive Dimension

According to the results, Chinese university students have a basic cognition ($M = 3.605$, $SD = 0.969$) of the role of ChatGPT in English writing teaching at a moderate level, and are more consistent in Q2, Q3, and Q4. They perceive ChatGPT not as a replacement, but as a supplemental tool to traditional pedagogies. It serves as a virtual writing assistant, providing students with writing feedback and reminders to help students examine errors and irregularities in grammar, vocabulary usage, and sentence structure, and provide proposals for corresponding modifications. At the same time, students can undertake writing training and practice through conversations with the ChatGPT. They can try to ask a variety of questions or writing tasks, and communicate and feedback repeatedly with the ChatGPT. Compared to the traditional cramming method of English writing teaching, ChatGPT brings students an updated experience. This shows that the image of ChatGPT in English writing is new, supportive, useful, diverse but positive.

B. Use Acceptance Dimension

The collected data indicates that university students are keen on using ChatGPT for English writing instruction. Their inclination is supported by a score of $M = 3.810$ with a standard deviation of $SD = 0.901$. These students are eager to adopt this new technology. University students are often at the forefront of societal innovation.

They are open to trying out new methods. English writing is particularly challenging for students, especially those who are not native speakers. This includes many Chinese university students. Mastering the details of English grammar, spelling, and vocabulary is difficult. ChatGPT provides immediate feedback for English writing. Recognizing this, students are very willing to use ChatGPT. They believe it can help reduce the difficulties they face in English writing.

C. Psychological Dimension

Based on the survey outcomes, the psychological dimension ($M = 2.679$, $SD = 1.000$) exhibits the lowest mean value, suggesting that students have reservations about the primacy of AI tools, such as ChatGPT, in an educational setting. Traditionally, educators play multifaceted roles in the instructional process, ranging from guiding and supporting student learning to organizing teaching content, imparting learning strategies, identifying student needs, and establishing evaluative benchmarks [14]. Historically, the educational paradigm has been predominantly teacher-centered. While ChatGPT excels in a learner-centric approach, due to its nascent stage in pedagogical applications, students harbor skepticism regarding its expansive deployment. Moreover, employing ChatGPT in English writing instruction could raise concerns related to educational equity. The propensity for students to over-rely on ChatGPT might circumvent genuine cognitive engagement and linguistic formulation, positioning ChatGPT as more of a “crutch” than a genuine educational facilitator. Hence, prevailing student perspectives seem to favor the traditional prominence of teachers in educational frameworks. An attempt by platforms like ChatGPT to entirely supplant educators could engender disruptions in both societal and educational structures.

D. Use of Actual Effect Dimension

Through surveys conducted among students familiar with ChatGPT and other linguistic models, it was discerned that the use of actual effect dimension ($M = 3.901$, $SD = 0.888$) yielded the highest average value, underscoring users’ satisfaction with ChatGPT’s efficacy. Both ChatGPT and similar expansive language models facilitate the generation of textual summaries and outlines, empowering students to rapidly grasp central themes and coherently structure their compositions. Furthermore, these models serve as pivotal tools in cultivating research aptitudes, providing students with comprehensive knowledge, primary sources, innovative perspectives, and contemporary issues related to their study domain, thereby enriching their understanding and analytical capabilities [15]. Diverging from conventional classroom instruction, ChatGPT offers a bespoke educational experience. This real-time, individualized interaction accentuates targeted writing guidance, promoting lexical enrichment, grammatical precision, and overall writing proficiency. Moreover, sophisticated models like ChatGPT boast an extensive content repository, instilling confidence in users regarding its potential to foster originality and inventive writing. Consequently, the

tangible benefits derived from ChatGPT are undeniably meritorious from the user's vantage point.

E. Technical Dimension

Large language model, like ChatGPT as a nascent technological tool, merits rigorous assessment concerning its technical performance. Survey data suggests a palpable dissatisfaction with ChatGPT's technological capabilities ($M = 2.686$, $SD = 0.898$). While respondents perceive its user interface as intuitive, as reflected in Q20 ($M = 2.130$) and Q21 ($M = 2.148$) averages, they harbor reservations regarding potential threats to data privacy and security. Inherent limitations of ChatGPT include its confined information access, superficial problem understanding, propensity to disseminate misinformation, and an absence of discernment and ethical reasoning, all demanding incessant refinement. Furthermore, the sensitive and personalized nature of student data accentuates concerns about data breaches, unauthorized data access, and its illicit deployment for non-academic purposes. Consequently, developers must implement comprehensive security measures encompassing advanced data encryption, stringent access protocols, and recurrent security evaluations. Prospective users are also advised to acquaint themselves with the platform's privacy terms and employ judicious precautions, such as refraining from inputting sensitive data and eschewing unsecured networks. As it stands, ChatGPT faces formidable technological challenges demanding enduring attention.

V. CONCLUSION

The incorporation of large language models in educational paradigms, especially within the domain of English writing instruction, presents a multitude of avenues to augment students' learning experiences and enhance pedagogical methodologies for educators. Drawing insights from the users' perspective, this study utilizes a questionnaire to probe the receptiveness and application of ChatGPT in the instruction of English writing among Chinese university students, alongside its consequential impact on this demographic. Results highlight a favorable disposition towards ChatGPT in terms of both its utilization acceptance and its perceived efficacy. However, the characterization of ChatGPT primarily as an instructional adjunct has resulted in a diminished acceptance in both the psychological and technological facets. Consequently, it remains implausible for ChatGPT to supplant the preeminent role of educators in English writing instruction in the foreseeable future. It necessitates further refinement, particularly in real-time evaluation, feedback provision, inventive content delivery, technological advancements, and user privacy safeguards. This research endeavor aims to inform the evolutionary trajectory of ChatGPT within educational frameworks and galvanize groundbreaking studies in harnessing digital innovations for educational advancement. In future studies, it should be explored how ChatGPT can be applied in the teaching process [16–19].

CONFLICT OF INTEREST

The author declares no conflict of interest.

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