

Exploring the Impact of WeChat Multimodality Affordances on Chinese EFL Undergraduates' Writing Development

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Abstract

Social media are increasingly integrated into foreign language education, offering new opportunities for multimodal writing practice. However, most existing studies focus on English-language-dominated platforms that are often inaccessible to learners in non-English-speaking contexts like China. This study explores the impact of WeChat's multimodal affordances on Chinese EFL undergraduates' argumentative writing within the framework of the College English Test. A mixed-methods approach was employed, combining a quasi-experimental design involving two classes (N=80) and semi-structured interviews conducted with nine students. Students in the experimental group significantly outperformed the control group in content (M=24.28 vs. 20.05; $p < .01$), organization (M=17.50 vs. 15.10; $p < .01$), and vocabulary (M=17.13 vs. 14.33; $p < .01$). Semi-structure interviews revealed that WeChat multimodal features enhanced clarity, creativity, and motivation but also led to distractions and revealed students limited multimodal literacy. This is the first known study to examine WeChat's multimodal affordances across specific dimensions of EFL writing in a Chinese context. Results demonstrate that WeChat's combination of text, audio, and visual features yields substantial gains in content development, vocabulary use, and organizational clarity, while gains in grammar and mechanics remain modest, highlighting the importance of guiding students to deploy multimodal resources with intentionality. The study offers practical implications for integrating locally relevant social media tools into EFL writing pedagogy and underscores the need for targeted instructional support to cultivate learners' multimodal competence.

Keywords: WeChat multimodality affordances, digital writing pedagogy, Chinese EFL learners, College English writing performance

1. Introduction

In the digital age, digital multimodal composing (DMC) has significantly reshaped the ways in which English as a Foreign Language (EFL) learners engage with writing. Unlike traditional text-based instruction, multimodal composing integrates various semiotic resources, such as text, image, audio, and video, into language learning and teaching (Cho & Kim, 2024). Moreover, the integration of DMC in EFL curriculum can bridge the gap between traditional literacy and digital literacy, providing students with a comprehensive skill that is necessary for modern communication (Jiang, 2017). The use of digital DMC in EFL settings has been shown to improve students' writing abilities, digital literacy, and overall engagement with the language learning process. In a study conducted in Iran, students who engaged in multimodal writing outperformed those who used traditional monomodal methods (Maghsoudi et al., 2022). Research indicates that DMC not only enhances writing skills but also fosters greater student engagement and participation in collaborative projects, ultimately enriching the EFL learning experience. This shift towards multimodal approaches highlights the necessity for educators to adapt their teaching strategies in order to meet the diverse needs of twenty-first-century learners. Particularly in contexts where access to authentic language input and communication is limited, digital multimodal tools offer promising affordances for fostering creativity, enhancing interaction, and improving overall writing proficiency (Li & Akoto, 2021). This pedagogical shift is underpinned by the theoretical framework of multiliteracies, proposed by the New London Group (1996), which emphasizes the importance of cultivating learners' multimodal competence alongside traditional linguistic skills. Drawing from social semiotics, this perspective views meaning-making as a socially situated process that involves the orchestration of multiple modes (Prihantoro et al., 2022). It provides a valuable lens for exploring how learners use and combine modalities to express their ideas more creatively, effectively, and persuasively.

The integration of social media into EFL writing instruction has been increasingly explored in recent years, with numerous studies highlighting its potential benefits and challenges. The integration of social media into educational practices has provided learners with new opportunities to engage with the language in a more interactive and informal setting, such as Instagram, WhatsApp, and Facebook, have been identified as valuable tools for enhancing EFL learners' writing skills by providing opportunities for authentic communication, fostering creativity, and increasing student engagement (Ariantini et al., 2021; Vanek et al., 2018).

Numerous studies have found that social media is effective in facilitating communication in a more informal context, allowing for real-time interaction and collaboration that traditional classroom settings may lack (Zainuddin et al., 2022), giving surprising opportunities for students to improve their writing skills (Yan, 2019). The potential possibilities of Facebook, Wiki, WhatsApp and Vlog have been announced as useful in improving English writing skills (Ariantini et al., 2021; Dizon, 2016; Pham & Li, 2023; Xie et al., 2021). Despite these promising outcomes, most empirical investigations have focused on global, English-dominant networks, which are frequently inaccessible or culturally incongruent for EFL learners in countries such as China. In the Chinese context, where WeChat reigns as the principal social media platform, its suite of multimodal tools like text messaging, voice notes, image and video sharing, and group discussions, which presents a uniquely situated opportunity to enhance L2 writing instruction. However, no study to date has empirically tested WeChat's multimodal features for EFL writing in China (Huang, 2018; Lei & Liu, 2020; Sun & Asmawi, 2023; W. Wang & Jiang, 2023). Therefore, there is a need for empirical research to investigate how WeChat's multimodal affordances can be systematically leveraged to support Chinese EFL learners' writing development.

Chinese college students face several challenges in English writing, particularly in the context of the College English Test (CET) due to a weak language foundation, limited ideas, and inadequate practice (Zeng, 2018). These challenges stem from various linguistic and pedagogical issues, which impact their ability to write effectively in English. The primary problems include lexical errors, discourse organization, and inadequate feedback mechanisms. A significant portion of students' writing issues are lexical errors, including incorrect parts of speech (32.81%), unacceptable word choices (34.38%), wrong spellings (23.43%), and collocation errors (9.37%)(Chen, 2021). College English writing has always been a weak part of Chinese learners (Yan, 2019), students have limited writing skills and strategies (Sang, 2017), low level of EFL writing competence, and lack motivation and confidence in English writing (Woodrow, 2011). The teaching of English writing in Chinese colleges faces challenges such as ineffective feedback and outdated teaching models (Huang, 2018; X. Wang et al., 2020).-

To address these issues, this study mainly aims to investigate the impact of WeChat multimodal affordance on writing performance among Chinese Undergraduates in Aha Teachers College and explores students' perceptions of multimodal elements in enhancing English writing. The findings are expected to inform pedagogical practice by offering evidence-based guidelines for integrating WeChat's multimodal tools into English writing curricula, thereby enhancing teacher training and instructional design. Moreover, insights into learners' attitudes toward multimodal composition will guide the development of learner-centered interventions and contribute to the theoretical understanding of technology-mediated writing in EFL contexts. The study specifically set out to address the following two research questions:

- 1) What is the effectiveness of WeChat multimodality affordance on Chinese undergraduates' writing performance?
- 2) How do the undergraduates perceive the multimodal elements in their writing?

The remainder of this paper is organized as follows: Section 2 synthesizes the extant literature on social media in language learning, the pedagogical potential of WeChat, and the role of multimodality in EFL writing. Next, Section 3 details the research design, including participant characteristics, data collection instruments, and analytical procedures. Section 4 then reports the empirical findings, and Section 5 interprets these results in relation to previous studies. Finally, Section 6 addresses the study's limitations, and Section 7 discusses pedagogical implications and directions for future research.

2. Literature Review

2.1 Social Media in EFL Writing

Social media has been greatly used to enhance foreign language teaching and learning. It has emerged as a significant tool in enhancing English writing skills. Research has examined the impact of social media's function on EFL writing and has shown that it presents encouraging opportunities to improve EFL writing skills. Social media facilitates real-world communication, enabling students to practice writing in a context that mirrors authentic language use, which can lead to improved language proficiency and a better understanding of informal and formal language structures (Alkamel, 2024; Pandey, 2024). Social media supports collaborative learning by allowing students to share their work, receive feedback, and engage in discussions with peers. This collaborative aspect can enhance writing skills by exposing students to diverse perspectives and writing styles (Dewi & Rizal, 2023; Kassim et al., 2024). The integration of social media into EFL writing instruction has been increasingly explored in recent years, with numerous studies highlighting its potential benefits and challenges. However, the effectiveness of these platforms can vary based on factors such as the specific social media tool used, the educational context, and the pedagogical strategies employed. A thorough literature review is necessary for a concentrated scholarship evaluation, and a methodical strategy was employed for that purpose. The keywords "social media" along with "English writing" and "multimodality" were used to search the Web of Science and Scopus databases. In Web of Science, the first search with "social media" AND "English writing" returned 7,909 results. After applying the filter for English articles only, the final sample was 5,590 sources between January 2018 and July 2025. Using Scopus, the same keywords yielded 378 records, which were then narrowed down to 319 after applying the same inclusion criteria. Non-article publications as well as articles written in languages other than English were also excluded, resulting in a more defined scope. As a result, between January 2018 and July 2025, 49 peer-reviewed papers were published. Research has examined the impact of social media's function on EFL writing and has shown that it presents encouraging opportunities to improve EFL writing skills. However, the majority of research concentrate on social media platforms that are dominated by English, most of which are inaccessible to EFL learners in non-English-dominant countries like China. Platforms like Instagram and

WhatsApp allow students to engage in creative writing and peer communication, which can boost their confidence and interest in learning English (Abdyrakhimova, 2024; Khurram et al., 2024). Besides, social media platforms such as Instagram, WhatsApp, and Facebook have been identified as valuable tools for enhancing EFL learners' writing skills by providing opportunities for authentic communication, fostering creativity, and increasing student engagement (Ariantini et al., 2021; Vanek et al., 2018). In China, due to differences in network environment and regulatory policies, social media like WeChat, QQ, and Microblog are frequently used to enhance collaborative learning and facilitate peer interactions among EFL learners, enabling them to practice their writing skills in authentic contexts while receiving immediate feedback from peers and instructors. These platforms promote a feeling of community as well as increasing interaction, allowing learners to share resources and experiences that enrich their understanding of the language and its practical applications (Dewi & Rizal, 2023).

Although social media has been widely used in language education globally, there has been relatively little research focusing on how Chinese English learners use social media to improve English writing within the Chinese context (Huang, 2018). Whereas Facebook-based studies frequently report gains in discrete writing mechanics, such as grammar accuracy and vocabulary use (Ariantini et al., 2021; Dizon, 2016). Current evidence on WeChat's impact on higher-order writing skills, such as coherence and rhetorical organization, is still limited and not yet conclusive. Much of the existing research relies on small-scale qualitative studies or self-reported data (Lei & Liu, 2020; Sun & Asmawi, 2023; W. Wang & Jiang, 2023). In addition, it remains unclear which specific features of the platform, such as text messaging, voice notes, or multimedia sharing, are most effective in supporting different aspects of writing development. Furthermore, educators may encounter difficulties in creating instructional activities that effectively use the features of social media to support learning (Alkamel, 2024). These unresolved issues emphasize the need for a systematic, empirical investigation of Chinese social media in the Chinese context. Specifically, it remains unclear how Chinese social media like WeChat influences students' writing performance.

2.2 WeChat in EFL Writing

WeChat is a free app that provides instant messaging for the smart terminal and was introduced by Tencent Company in May 2011. As one of the most widely used social media platforms in China, WeChat has become an integral tool in various aspects of education, including English language learning and writing practices. The literature base for this review was established through a search of the Web of Science database using the keywords "WeChat" AND "English writing." The initial 142 results were narrowed down to 127 peer-reviewed English-language articles published between 2018 and 2024, after removing non-article types and non-English sources. A parallel search in Scopus returned 23 records, of which 17 met the same inclusion criteria. From the literature review of WeChat in English writing, WeChat was found that it offers a wide range of functions, including cross-platform support for sending free voice messages, videos, images, and text, which offers unique features that support interactive and real-time communication, making it a valuable tool in educational settings. The integration of WeChat in EFL writing has garnered attention due to its potential to facilitate peer feedback and enhance writing skills among learners. It has been shown to significantly enhance students' mastery of the English language, as evidenced by various studies (Shi et al., 2024). Its ability to provide instant communication without time or location constraints has made it the preferred messaging tool among modern college students. English educators are increasingly exploring teaching models that integrate popular communication platforms with language instruction. In particular, the "Moments" feature of WeChat transcends the limitations of traditional college English teaching by serving as a bridge between teachers and students, as well as among classmates and friends, thereby extending in-class learning through real-time sharing and discussion of opinions and achievements (W. Wang & Jiang, 2023). Research shows that the availability of WeChat enhances educational opportunities outside of traditional educational environments (Wang & Jiang, 2023). WeChat facilitates peer feedback, which is crucial for improving writing skills. It allows students to exchange ideas and critiques in real time, enhancing their ability to develop content and ideas, maintain coherence, and improve grammar and vocabulary (Shi et al., 2024). Following this trend, Sun and Asmawi (2023) found that students possessed positive perceptions of using WeChat for peer feedback in English writing. Moreover, the platform's user-friendly interface and widespread use in China make it an accessible tool for students, encouraging more frequent and meaningful interactions (Shi et al., 2024). WeChat supports mobile-assisted language learning (MALL) by providing a platform for students to engage in language learning activities outside the traditional classroom setting, promoting continuous learning and engagement (Guo & Wang, 2018).

The findings indicate that using WeChat generally benefits overall English language learning. It can serve as a valuable tool for language educators by creating a blended learning environment that integrates multiple communication modalities. In particular, the diverse functionalities of the WeChat Public Platform, such as sharing text, images, video, and audio, have been effectively used for teaching English writing (Sun & Asmawi, 2023). However, its effectiveness in enhancing specific analytical aspects of English writing remains uncertain (Shi et al., 2024). For instance, while improvements were observed in task response and grammatical range and accuracy, the WeChat Moments feature did not produce statistically significant gains in lexical resource or in the coherence and cohesion of students' writing (W. Wang & Jiang, 2023). These mixed results highlight the need to further investigate the specific effects of WeChat-based instruction and how its multimodal features can be effectively used to support different components of EFL writing development.

2.3 Multimodality in EFL Writing

The integration of multimodality in EFL writing instruction has gained significant attention in recent years. The term Multimodality describes the use of several means of communication, including text, pictures, voice, and video, to convey meaning (Lim & Kessler, 2023). It is rooted in the social semiotic approach, which views communication as a process of making meaning through various semiotic

resources (Thanh Hoa, 2023). This approach has been recognized for its potential to enhance language learning, particularly in writing, by providing students with diverse ways to express themselves and engage with content. The integration of multimodality in EFL writing instruction is supported by various theoretical frameworks, including the New London Group's work on multiliteracies, which emphasizes the importance of understanding and using multiple forms of communication in a globalized world (Li & Akoto, 2021). In the context of EFL writing, multimodality offers a framework for understanding how different modes can be combined to create richer and more engaging texts. The shift towards multimodal instruction encourages learners to develop critical thinking and creativity, as they navigate different forms of expression and audience engagement while constructing their written work. This approach is particularly relevant in today's digital age, where learners are increasingly exposed to and expected to produce multimodal texts (Paradita, 2023).

Multimodal writing tasks have been shown to increase student engagement and motivation in EFL classrooms. By incorporating digital tools and multimedia elements, such as videos, images, and audio, into writing tasks, students are provided with more dynamic and interactive ways to express themselves (Paradita, 2023). Studies have demonstrated that multimodal writing can lead to improvements in certain aspects of writing, including content, organization, and language use. For example, digital storytelling projects have been found to enhance students' ability to structure their writing and use rhetorical devices effectively (Maamuujav et al., 2024). Additionally, the use of multimodal texts, such as flashcards with audio and visual elements, has been shown to improve narrative writing skills in EFL learners (Anggun Triya Novita et al., 2024). Multimodal writing tasks also contribute to the development of digital literacy skills, which are essential for effective communication in the 21st century. Students' perspectives on multimodal writing tasks are largely positive, with many appreciating the opportunity to express themselves in creative and interactive ways. For example, students have reported that digital storytelling and video projects make writing more enjoyable and allow them to showcase their skills and interests (Khalid & Janjua, 2024). However, some students may feel anxious about the technical aspects of multimodal writing tasks or may prefer the simplicity of traditional writing methods (Alfathira, 2024). Students tended to produce more text in the Digital Multimodal Composing (DMC) projects than in traditional monomodal writing. However, both groups show no difference in complexity and accuracy, and the DMC group showed more improvement in all areas (content, organization, language) when compared to the traditional group (Kim et al., 2023). The results of the study showed that as compared with the control group, the experimental group displayed significant improvements in five aspects of L2 writing (i.e., text length, mean length per T-unit, task requirement, content, and comprehensibility) but no improvement in accuracy, coherence and cohesion (Xu, 2023). These findings highlight the potential of digital multimodal composing to enhance specific dimensions of L2 writing, underscoring the need for continued exploration of its pedagogical value.

Despite promising evidence that WeChat's multimodal affordances and multimodal writing tasks can boost learner engagement, content generation, and certain writing outcomes, critical gaps remain. First, the differential effects of specific WeChat features such as text messaging, voice notes, multimedia sharing and Moments on different writing dimensions such as lexical resource, coherence and rhetorical organization have not been systematically compared or rigorously measured. Second, much of the existing work relies on small-scale qualitative designs or self-reported data, limiting our ability to isolate the causal impact of individual multimodal tools. Third, although multimodal tasks appear to strengthen content, structure and fluency, their influence on analytical aspects of writing accuracy and cohesion remains equivocal. Finally, the majority of studies have focused on English-dominant platforms or contexts outside China, leaving unanswered questions about how China's ubiquitous WeChat platform can be harnessed to improve EFL writing in ways that are both pedagogically effective and culturally relevant. To address these unresolved issues, the present study examines whether and to what extent WeChat's multimodal functions enhance Chinese undergraduates' English writing performance and explores learners' perceptions of how those multimodal elements shape their composing processes.

3. Method

The study aimed to explore the impact of WeChat multimodality affordances on the English writing performance of Chinese undergraduates enrolled in first-year courses at Aba Teachers College. It employed a mixed-methods design, combining a quasi-experimental approach with semi-structured interviews. In this quasi-experimental study, two intact freshman classes were selected based on practical and pedagogical considerations. Both classes were enrolled in the same compulsory College English I course, followed similar timetables, and were taught by the same instructor. The use of intact classes is a common approach in educational settings where random assignment is not feasible, especially in institutional contexts where existing administrative and curricular constraints must be respected (Mackey & Gass, 2015). This design choice also helped to control for potential instructor-related and scheduling confounds, thereby enhancing internal validity. One class (n=40) was designated as the experimental class (EC) and received instruction involving integrated WeChat-based multimodal composing activities, while the other class (n=40) served as the control class (CC) and received traditional writing instruction. Ethical approval for the study was granted by the Research Ethics Committee of Aba Teachers College, and written informed consent was obtained from all participants prior to data collection. Additionally, nine interviewees were selected using a purposive sampling strategy based on their pre-test writing scores in the experimental class. This approach ensured representation across the full spectrum of initial proficiency levels and maximized variation in learner experience. Specifically, students were grouped into three score bands: below 60, between 60 and 70, and between 70 and 80. Three participants were drawn from each band (n=3 per band), reflecting low, medium, and high performers. Although two EC students scored above 80 on the pre-test, this subgroup was too small to warrant separate sampling and thus was not included among the nine interviewees. By stratifying interviews in this way, the study captures diverse perspectives on how WeChat's multimodal features affect writing processes and outcomes across differing levels of initial writing ability. This research was carried out for 16 weeks in the academic year of 2024-2025.

3.1 Participants

The participants in this study were first-year non-English majors from Aba Teachers College in China. A total of 80 students took part in the research, with 40 students in each of the two intact classes selected for the quasi-experiment. One class served as the experimental class and the other as the control class. Among the participants, the control class consisted of 25 female and 15 male students, while the experimental class included 22 female and 18 male students. The students, aged between 18 and 19 on average, were enrolled in a compulsory college English course. All of them had completed senior high school and shared similar educational backgrounds and English proficiency levels. Their familiarity with smartphones and frequent use of social media platforms like WeChat made them well-suited for a study investigating the impact of WeChat multimodal features on undergraduates' EFL writing. The demographic information of the participants was summarized in the table below:

Table 1. Demographic information of the participants

Group	N	Female	Male	Age
Control Class	40	25 (62.5%)	15 (37.5%)	18.45
Experiment Class	40	22 (55%)	18 (45%)	18.58
Total	80	47 (58.75%)	33 (41.25%)	

3.2 Instruments

3.2.1 College English Test-4

The study employed a mixed-methods approach using both quantitative and qualitative instruments. The writing task in the College English Test 4 (CET-4) was utilized to assess potential improvements in students' writing performance in the pre-test and post-test design. The CET was designed to assess Chinese undergraduate students' English competency and make sure they met the language proficiency requirements outlined in the National College English Teaching Syllabuses (NCETS). Administered by the Ministry of Education, the CET-4 is typically taken by non-English major students in their first academic year. The writing section requires students to compose an essay based on the information provided to express ideas coherently and accurately in English (See Appendix A). The time limit is 30 minutes. Since the CET-4 writing test adopts a holistic scoring approach, therefore, the same raters assessed all writing papers in both the pre and post-tests using the rating scales developed by Jacobs (1981). The scales focus on five key components: content, organization, vocabulary, language use, and mechanics. Each component is deemed significant and contributed to the final performance evaluation as follows: content contributed 30 points, organization 20 points, vocabulary 20 points, language use 25 points, and mechanics, though less weighted, still contributed 5 points to the final performance score. For computation and statistical analysis, the scores given by the two raters, who had experience in rating CET-4 writing, for each component were converted into a standardized scale out of 100 points. This allowed for a consistent and comparable measure of the participants' writing performance before and after the intervention. The national standardized CET-4 writing test allowed for objective measurement of students' writing proficiency, with the collected data subsequently analyzed using SPSS 26.0 statistical software to determine significant changes in writing performance.

3.2.2 Semi-structured Interview

A semi-structured interview was conducted to explore students' experiences and perceptions regarding the use of multimodal elements, such as images, videos, voice messages, and emojis, on WeChat to support their English writing. Nine students were purposively selected from the experimental class to participate in the interview. The questions focused on how students used WeChat's multimodal features during the writing process, their perceptions and potential challenges, the influence on their idea generation and motivation, and the effectiveness of receiving feedback in different formats (See Appendix B). This qualitative data complemented the quantitative findings by providing deeper insight into how learners engaged with multimodal tools to enhance their writing. The interviews focused on seven open-ended questions, allowing for follow-up investigations based on participant responses. Questions explored how specific multimedia features influenced drafting, feedback, and peer collaboration, as well as perceived advantages or challenges compared to traditional text-only writing methods. To ensure the reliability and validity of the interview questions, three experts majoring in TESL conducted a content validity review of the interview protocol. The semi-structured interview is going to last about 30 minutes for each interviewee.

3.3 Data Collection and Analysis

Data collection for this study utilized a mixed-method approach to comprehensively investigate the impact of WeChat multimodality affordance on Chinese undergraduates' writing performance and their perceptions of multimodal elements in enhancing their writing. This approach involved gathering measurable data on writing performance and qualitative semi-structured interviews to explore students' personal experiences and insights regarding the use of multimodal elements in their writing processes. The combination of these methods allowed for a robust analysis, enabling researchers to triangulate findings and gain a deeper understanding of how multimodal affordances in WeChat influence not only some aspects of writing but also the cognition and emotion experienced by students.

This study adopted a quasi-experimental design involving an experimental class (EC) and a control class (CC). The experimental class received writing instruction integrated with WeChat's multimodal affordances, while the control class followed traditional writing instruction methods. In the first week of the study, all participants completed a pre-test in the form of a CET-4 argumentative writing task. This was followed by a 14-week instructional intervention. In the sixteenth week, students completed a post-test, which was another CET-4 argumentative writing task with a topic which is similar to that of the pre-test (See Appendix A). The results were evaluated using the ESL Composition Profile rubric (Jacobs, 1981). The data including overall scores and five aspects: content, organization, vocabulary,

language use, and mechanics, were analyzed using SPSS 26.0 to assess differences to examine the effectiveness of WeChat's multimodal features in enhancing students' writing performance. Prior to hypothesis testing, normality of score distributions were assessed using Shapiro–Wilk tests (pre-test, $p = .81$; post-test, $p = .20$; both $p > .05$), and homogeneity of variances across groups was confirmed via Levene's tests (pre-test = 0.54; post-test = 0.91). As all p values exceeded .05, the data met assumptions for parametric analysis. An independent samples t-test was conducted to compare the post-test writing performance between the two classes and to determine whether the WeChat multimodal affordances had a statistically significant effect on students' writing outcomes. In addition, a paired samples t-test was employed to analyze the differences in writing performance within the experimental class before and after the intervention to assess the effectiveness of the instructional approach over time.

After the intervention, nine students chosen from the experimental class were invited to join a semi-structured interview to find out their perceptions of using multimodal elements during the writing process. The whole interview process will be recorded with the permission of the respondents. Although the interview sessions are guided by seven pre-planned questions, the structure is flexible enough to allow participants to share their subjective viewpoints, elaborate on their responses, and provide rich, detailed insights into their learning experience. To ensure that students felt comfortable and could express themselves clearly, the interviews were conducted in Chinese. The responses were subsequently translated into English and returned to the respondents for verification, ensuring the accuracy and reliability of the translated content and keeping the integrity of the original meanings during data analysis. The interviews were conducted after the intervention period, and the collected data were analyzed thematically using NVivo to identify related themes, patterns, and insights. To enhance the trustworthiness of the qualitative data, researcher performed all coding and afterward implemented member checking by sharing translated responses and emerging themes with participants. This process helped guarantee that the meanings and interpretations purported aligned with what students intended. Moreover, methodological triangulation was used where students' interview responses were compared with their actual performance outcomes on writing tasks within particular parameters (e.g. content, organization, language use, vocabulary, mechanics) to understand how WeChat's multimodal features shaped students' writing skills and perceptions more holistically.

3.4 Ethical Consideration

Ethical approval for the study was granted by the Academic Committee of Foreign Language School at Aba Teachers College. The approval was obtained before the implementation of the research in the first semester of the 2024–2025 academic year. Participation in the study was entirely voluntary. Students were informed of the study's objectives and procedures before completing the pre-test questionnaire, and informed consent was obtained from all participants before the study. They were assured of their anonymity and confidentiality. The study followed ethical requirements by guaranteeing that participants could withdraw from the study at any time without punishment, thereby prioritizing their autonomy and well-being throughout the process.

4. Results

4.1 RQ1: What Is the Effectiveness of WeChat Multimodality Affordance on Chinese Undergraduates' Writing Performance?

Comparison of Pre-test between Experimental and Control Classes

The experimental and control classes were compared using an independent sample t-test to determine whether there was a significant difference in the pre-test. Table 2 exhibits the results.

Table 2. Independent sample t-test between EC and CC in the pre-test

	Groups	N	Mean	SD	t	df	p
Content	EC	40	18.33	2.595	.516	78	.607
	CC	40	18.60	2.146			
Organization	EC	40	14.78	3.025	-.786	78	.434
	CC	40	14.35	1.594			
Vocabulary	EC	40	14.08	1.789	-.331	78	.742
	CC	40	13.95	1.584			
Language use	EC	40	17.10	2.426	-.045	78	.964
	CC	40	17.08	2.495			
Mechanics	EC	40	2.38	.807	-.574	78	.568
	CC	40	2.28	.751			
Overall Score	EC	40	66.65	9.236	-.212	78	.832
	CC	40	66.25	7.537			

Notes: Control Class: CC, Experimental Class: EC

The purpose of the independent sample t-test was to check whether the control and experimental classes had any significant pre-existing differences. Table 2 shows that, in the pre-test phase, the CC had an overall mean score of 66.25 ($SD=7.537$) and EC had an overall mean score of 66.65 ($SD=9.236$), the sig value of the overall scores in the two classes in the pre-test was .832, which was greater than 0.05. Consequently, the pre-test results for the two classes did not differ significantly. From the content, organization, vocabulary, language use, and mechanics aspects, the sig value shows that there was no significant difference between the EC and CC, which indicates that both classes entered the experimental phase with comparable baseline writing knowledge and skills, providing a solid foundation for

evaluating the impact of the WeChat multimodal affordance implemented in this study.

Comparison of Post-test between Experimental and Control Classes

To ascertain whether there was a significant difference between the experimental and control classes in the post-test, an independent sample t-test was employed again. Table 3 illustrates the results of the experiments.

Table 3. Independent sample t-test between EC and CC in the post-test

	Groups	N	Mean	SD	t	df	p	95% Confidence Interval of the Difference		Cohen's d
								Lower	Upper	
Content	EC	40	24.28	1.710	-11.745	78	<0.01	-4.941	-3.509	-2.626
	CC	40	20.05	1.501						
Organization	EC	40	17.50	.847	-10.902	78	<0.01	-2.839	-1.961	-2.438
	CC	40	15.10	1.105						
Vocabulary	EC	40	17.13	.791	-12.757	78	<0.01	-3.238	-2.362	-2.853
	CC	40	14.33	1.141						
Language use	EC	40	18.95	1.600	-1.398	78	.083	-1.334	.234	-0.313
	CC	40	18.40	1.905						
Mechanics	EC	40	2.58	.594	-.375	78	.354	-0.316	.216	-0.084
	CC	40	2.53	.599						
Overall Score	EC	40	83.83	4.506	.909	78	<0.01	-15.764	-11.836	-3.127
	CC	40	70.03	4.317						

As reported in Table 3, the results revealed that the EC significantly outperformed the CC in three key aspects of writing: content, organization, and vocabulary. Specifically, the mean score for content in the EC was 24.28 (SD=1.71), whereas the CC obtained a lower mean score of 20.05 (SD=1.50). In terms of organization, the EC achieved a mean score of 17.50 (SD=0.85), compared to 15.10 (SD=1.11) in the CC. For vocabulary, the mean score of EC was 17.13 (SD=0.79), while the CC scored 14.33 (SD=1.14). All differences were statistically significant at the $p < 0.01$ level, these results suggest that the intervention implemented in the EC had a substantial positive impact on students' ability to generate ideas, structure their writing, and use a wider range of lexical resources. Although the EC achieved a slightly higher mean score in language use ($M=18.95$, $SD=1.60$) compared to the CC ($M=18.40$, $SD=1.91$), the difference was not statistically significant ($p=.083$), which was greater than 0.05. Similarly, no significant difference was found in mechanics between the two classes ($p = .354$). Notably, the EC demonstrated a significantly higher overall writing score ($M=83.83$, $SD=4.51$) than the CC ($M=70.03$, $SD=4.32$), with $p < 0.01$, highlighting the overall effectiveness of the treatment. These findings indicate that while both classes performed similarly in language use and mechanics, the EC benefited more in content, organization and vocabulary as a result of the WeChat multimodality affordance.

Comparison of Pre-test and Post-test in Experimental Class

To assess the experimental class's pre-test and post-test results and ascertain whether there has been a relative improvement, the paired sample t-test was employed. Tables 4 and 5 illustrate the results of the experiments.

Table 4. Paired sample statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre-content	18.33	40	2.596	.410
	post-content	24.25	40	1.721	.272
Pair 2	pre-organization	14.78	40	3.025	.478
	post-organization	17.55	40	.815	.129
Pair 3	pre-vocabulary	14.08	40	1.789	.283
	post-vocabulary	17.15	40	.802	.127
Pair 4	pre-language use	17.10	40	2.426	.384
	post-language use	18.93	40	1.575	.249
Pair 5	pre-mechanics	2.38	40	.807	.128
	post-mechanics	2.58	40	.594	.094
Pair 6	pre-test	66.65	40	9.236	1.460
	post-test	83.95	40	4.607	.728

Table 4 displays the descriptive statistics for the experimental class's pre- and post-test outcomes. As can be seen, the experimental class's average pre-test and post-test scores are 66.65 and 83.95, respectively. And it is obvious to see there was an increase in the other five aspects of writing.

Table 5. Paired sample t-test

		Paired Differences					t	df	Sig.
		Mean	SD	Std Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pre-content - post-content	-5.925	2.596	.410	-6.755	-5.095	-14.436	39	<.001
Pair 2	pre-organization - post-organization	-2.775	2.878	.455	-3.695	-1.855	-6.099	39	<.001
Pair 3	pre-vocabulary - post-vocabulary	-3.075	1.542	.244	-3.568	-2.582	-12.609	39	<.001
Pair 4	pre-language use - post-language use	-1.825	2.427	.384	-2.601	-1.049	-4.755	39	<.001
Pair 5	pre-mechanics - post-mechanics	-.200	1.043	.165	-.533	.133	-1.213	39	.232
Pair 6	pre-test - post-test	-17.300	7.949	1.257	-19.842	-14.758	-13.764	39	<.001

The results of the paired samples t-test for the experimental class in Table 5 indicated statistically significant improvements across most writing components. Specifically, the differences between pre-test and post-test scores in content ($M=-5.93$, $t=-14.44$, $p<.001$), organization ($M=-2.78$, $t=-6.10$, $p<.001$), and vocabulary ($M=-3.08$, $t=-12.61$, $p<.001$) were all significant at the .001 level, demonstrating substantial gains in these areas. Furthermore, a significant improvement was also observed in language use ($M=-1.83$, $t=-4.76$, $p<.001$), suggesting that the participants made meaningful progress in their ability to use language more effectively. However, no significant difference was found in mechanics ($M=-0.20$, $t=-1.21$, $p=.232$), indicating that students' control of mechanics remained relatively stable. Overall, the total writing score of EC showed a significant increase from the pre-test to the post-test ($M=-17.30$, $t=-13.76$, $p<.001$), confirming the positive impact of the intervention on the students' writing performance in EC.

The findings of this study provide evidence for the effectiveness of WeChat multimodality affordance in enhancing Chinese undergraduates' writing performance. Quantitative analysis revealed that students in the experimental class, who were exposed to WeChat-based multimodal writing activities, significantly outperformed those in the control class in content development, organization, and vocabulary use. While there was no statistically significant difference between the two classes in language use and mechanics on the post-test. Paired samples t-test results indicated that the experimental class made considerable progress in language use from pre-test to post-test. Moreover, the overall writing score of the experimental class increased markedly, further confirming the positive impact of the intervention. These results suggest that the integration of WeChat multimodal features, such as text, image, video, and voice messaging, can effectively support learners in developing their writing skills, fostering idea generation, and enriching lexical resources, thereby promoting overall writing performance.

4.2 RQ2: How Do the Undergraduates Perceive the Multimodal Elements in Helping Their Writing?

A semi-structured interview was adopted to capture detailed insights into students' perceptions of WeChat multimodal elements. The interview protocol explored their use of pictures, voice messages, videos, and infographics in various writing tasks, and the responses were subsequently transcribed and analyzed using NVivo software to identify themes. The thematic analysis procedures and trustworthiness enhancement strategies have identified two primary codes and a total of 6 associated themes (Rosairo, 2023), which explored their perceptions of multimodal elements in English writing. Table 8 presents a comprehensive summary of the NVivo coding results, categorizing the participants' responses into key themes.

Table 6. Thematic analysis results

Code	Theme	Frequency	Example
Writing Enhancement	enhance clarity	9	P3: "Before, my arguments felt jumbled. With images, I could anchor each point to a visual, which made my structure clearer to myself and my peers." P12: "The mind maps and infographics helped me visually organize my essay. I could literally see gaps in my logic, like missing transitions, that I'd overlooked in plain text."
	foster creative expression	9	P7: "Voice notes freed me from over-editing while drafting. I'd record rambling ideas first, then refine them later. It felt more human than staring at a blank document." P9: "Using memes to represent counterarguments was fun! It pushed me to think outside formal academic language without losing rigor."
	boost motivation and active participation	11	P5: "The group's infographic gallery became a competition. We wanted to outdo each other's designs, which accidentally improved our content too." P3: "Hearing my instructor's voice or seeing their facial expressions in the video feedback made it feel like a real conversation. I rewatched it at least three times. I'd never revisit written feedback that much."
Challenges	lead to distraction	5	P1: "I opened WeChat to draft my conclusion, but notifications kept popping up. I ended up scrolling through Moments for 20 minutes instead

		of writing, completely forgetting my original argument.”
		P4: “I was editing my essay in WeChat when a classmate sent a funny sticker in our group chat. I meant to reply quickly, but soon we were all sharing memes and joking around. By the time I refocused, I’d wasted nearly half an hour and lost my train of thought.”
disrupt the narrative flow of the writing	2	P2: “My infographic looked great alone, but it clashed with my essay’s tone. Fixing it took more time than writing.”
lack of multimodal literacy	3	P5: “Sometimes the pictures or voice messages didn’t match well with what I was writing, and it made the writing feel disjointed.” P4: “I pasted a diagram beside my conclusion, but my professor said it didn’t add value. I didn’t know how to integrate it properly.”

As illustrated in Table 6, the thematic analysis revealed three primary themes under Writing Enhancement: enhance clarity (frequency=9), foster creative expression (frequency=9), and boost motivation and active participation (frequency=11). Students emphasized that visual tools like images and infographics helped them “*see the structure of their arguments clearly and logically*”, aligning with interview question 3 on clarity and creativity. This finding aligns with previous statistical results that indicated a significant improvement in content and organization among students exposed to the WeChat-based multimodal affordance. Voice messages and videos were perceived as enabling efficient idea articulation, with one participant noting that such features allowed them to “*express thoughts creatively*” (interview question 4). Multimodal features were also found to increase students’ emotional engagement, as students reported feeling “*more involved*” when using dynamic media (interview question 5), which suggested a positive shift in learners’ writing performance and engagement levels.

Despite these benefits, several challenges also emerged. Some students reported that the multifunctionality of WeChat occasionally led to distraction, drawing attention away from the core task of composing. Others expressed difficulty maintaining coherence when integrating multimodal elements in their writing, as mismatches between visual and textual content disrupted the narrative flow. Moreover, a lack of multimodal literacy was identified as a barrier, with some students unsure how to use these tools meaningfully and strategically within an academic writing context. These findings suggest that while multimodal affordances can enhance both cognitive and affective aspects of writing, their successful application relies heavily on students’ ability to integrate them purposefully. Future studies should focus on effective training and support in multimodal literacy which could empower students to use these tools more effectively, ultimately leading to improved writing outcomes and a deeper engagement with their academic work.

5. Discussion

This section discusses the findings aligned with the two research questions. For the first question, results demonstrated that Chinese EFL undergraduates who utilized WeChat’s multimodal affordances exhibited statistically significant improvements in their argumentative writing performance, particularly in *content*, *vocabulary*, and *organization*, compared to the control class. The sig value of vocabulary scores shows that the multimodal affordance helps students increase their vocabulary, which is also seen in the study that visuals are often used to support language activities, helping students connect new vocabulary with its visual representation (Salbego et al., 2015). These findings align with studies emphasizing the role of multimodal tools in scaffolding cognitive processes and structural clarity and creativity in writing tasks (Allagui, 2022; Pham & Li, 2023; Xujie, 2023). Furthermore, the integration of WeChat multimodal affordance not only facilitated collaborative learning but also created a more engaging and interactive environment, which also aligned with the thematic analysis. This enhancement appears to positively impact students’ motivation and confidence in their writing abilities, as evidenced by the thematic analysis, which aligns with findings from previous research (Yan, 2019). These outcomes suggest that incorporating the multimodal functions in social media platforms like WeChat into language learning could transform traditional educational practices, promoting a more dynamic and effective approach to developing writing skills among EFL learners. However, given that this study was conducted at a single institution over a 16-week period with first-year non-English majors, findings may inform blended-learning design at similar colleges but should not be generalized to all higher-education settings. The implications of these findings extend beyond individual classrooms, highlighting the potential for broader educational reforms that embrace technology as a vital tool in language acquisition and pedagogy. However, the lack of significant differences in *language use* and *mechanics* suggests that multimodal interventions may prioritize macro-level writing skills over grammatical precision, echoing debates about the uneven impact on linguistic accuracy (Kim et al., 2023; Rachawong & Phusawisot, 2025). One potential explanation is that the task design and rubric placed greater emphasis on idea generation and coherence, which may have under-weighted form-focused dimensions such as syntax and mechanics. In addition, varying levels of learner digital literacy could have limited students’ ability to use WeChat’s multimodal features for detailed language editing, resulting in smaller gains in these areas.

As for the results of the second question, the thematic analysis of interview data demonstrated that Chinese EFL undergraduates hold positive perceptions toward multimodal elements in supporting their writing development. Students reported that WeChat multimodality affordances facilitated collaborative learning and created a more engaging and interactive environment. This enhancement appears to positively impact students’ motivation and confidence in their writing abilities, as evidenced by the thematic analysis, which aligns with findings from previous research. For instance, participants noted that visual aids helped them “*see the structure of their arguments clearly*”, while voice messages fostered innovative and quick thinking. These outcomes echo sociocultural theories positing that multimodal resources amplify learner agency and engagement (D’warte, 2021). Despite their benefits, the integration of images and videos into written

texts is not without challenges. Challenges such as *distraction* and *disrupted narrative flow* emerged, reflecting cognitive overload risks in feature-rich environments, which echo Mujiyantos' (2016) warning that poorly aligned visuals can mislead or distract readers (Pekūnas, 2019).

The quantitative and qualitative results together indicate that WeChat multimodality provides valuable scaffolding for specific writing skills, particularly in content development, vocabulary acquisition, and organizational structure. At the same time, the absence of significant improvement in language use and mechanics underscores the need to integrate targeted, form-focused instruction alongside multimodal activities in future implementations. The absence of significant improvement in language use and mechanics suggests that these aspects may require more traditional, focused instruction or different pedagogical approaches. These findings underscore the importance of integrating multimodal tools like WeChat as complementary resources rather than complete replacements for conventional writing instruction. Our research contributes to the growing body of literature on technology-enhanced language learning by specifically examining the affordances of WeChat, a widely used platform in the Chinese context. It provides empirical evidence for the selective benefits of multimodal support in EFL writing development and highlights areas where traditional instruction remains valuable. Given the study's limited scope, both in sample size and duration, the conclusions should be interpreted within this specific context, and caution is advised when extending them to other settings or learner populations. These insights can guide educators in designing blended approaches that leverage the strengths of both multimodal and conventional teaching methods to comprehensively develop students' writing skills. Future research should explore how WeChat multimodality affordances might be optimized to address the areas where limited improvement was observed, particularly language use and mechanics. Additionally, longitudinal studies could investigate the sustained impact of multimodal support on writing development over extended periods. Exploring combinations of digital and traditional pedagogical approaches might also yield valuable insights for comprehensive writing instruction in EFL contexts.

6. Limitations of the Study

Although the research design incorporated both quantitative and qualitative methods to examine the impact of WeChat multimodality affordances on writing development, this study has several limitations that should be acknowledged. On the one hand, the sample size of 80 non-English major undergraduate students is relatively small, which may limit the generalizability of the findings. A larger number of samples would have offered stronger statistical evidence and may have shown other patterns or effects that were not detectable in the data at hand. On another hand, the study was conducted exclusively at Aba Teachers College, which restricts its applicability to other educational contexts in China. Different institutions may have different educational resources, teaching methodologies, technological infrastructure, and student demographics which could influence the effectiveness of WeChat multimodality affordances in writing instruction in the EFL context. Additionally, this research focused only on argumentative writing, which represents only one of many writing types that students need to master. The effectiveness of WeChat multimodality affordances may vary across different genres such as narrative, descriptive, expository, or technical writing. Each genre has unique structural, stylistic, and rhetorical requirements that might respond differently to multimodal support.

These limitations suggest valuable directions for future research, including expanding the sample size, extending the study to multiple institutions across different regions in China, incorporating more diverse writing genres, implementing longitudinal designs to assess the long-term effects of WeChat multimodality affordances on EFL writing development, and investigating how multimodal support might be used to address the specific requirements of different writing types.

7. Conclusion

This study revealed that WeChat multimodality affordances have a positive impact on Chinese EFL undergraduates' writing development, albeit with some limitations. The research demonstrated that students who received WeChat multimodal support exhibited statistically significant improvements in content, vocabulary, and organization in their argumentative writing compared to the control class. However, no significant differences were observed in language use and mechanics, suggesting that multimodal tools may have selective benefits in writing instruction. The qualitative findings from thematic analysis confirmed that Chinese EFL undergraduates hold positive perceptions toward multimodal elements in supporting their writing development. Students reported that WeChat multimodality affordances facilitated clear and creative writing and created a more engaging and interactive environment, which enhanced their motivation and confidence in English writing. It was found that there was a meaningful distinction between the impact of multimodal tools on different aspects of writing skill development, with content, vocabulary, and organization showing greater improvement than language use and mechanics. This indicates that educators should consider complementary approaches to address all aspects of writing proficiency when designing EFL writing instruction.

By demonstrating how WeChat's integration of visual, auditory, and textual modes selectively enhances higher-order writing processes, this study advances our understanding of digital multiliteracies theory in the EFL context, showing that multimodal scaffolding can enrich meaning-making beyond traditional text-only pedagogy. These findings contribute to our understanding of how digital multimodal tools can be effectively integrated into EFL writing instruction and highlight the importance of balanced pedagogical approaches that leverage technology while addressing areas where traditional instruction remains valuable. In sum, this research not only confirms the practical benefits of WeChat's multimodal affordances but also offers a theoretically grounded framework for future explorations of multimodal pedagogy in language learning. Future research should explore these relationships across more diverse contexts, larger samples, and multiple writing genres to develop a more comprehensive understanding of how multimodal affordances can best support writing

development among Chinese EFL learners.

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Authors' contributions

Dr. Zhenfang Liao is responsible for the fieldwork data collection, analysis, and manuscript drafting. Prof. Dr. Supyan and Associate Prof. Dr. Harwati supervised and provided guidance on the research design and assisted with the revision and proofreading of the manuscript.

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Appendix A

CET-4 Writing Test

Name:		Score:	
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Directions: For this part, you are allowed 30 minutes to write a short essay on the following topic. You should write at least 120 words but no more than 180 words.

Pre-test: Some people believe that technology impacts people's life positively. Others feel that technology affects people's life negatively. What is your opinion? Use specific reasons and details to support your answer.

Post-test: Some people believe that social media (WeChat, DouYin, QQ, etc.) impacts people's life positively. Others feel that social media affects people's life negatively. What is your opinion? Use specific reasons and details to support your answer.

Appendix B**Semi-structured Interview**

1. Can you describe how you use various WeChat multimodal features (such as pictures, voice messages, videos and infographics) when working on your English writing assignments?
2. How do you perceive the use of multimodal elements (videos, pictures, audio, infographics) in your writing process?
3. In what ways do these multimodal elements help you express your ideas more clearly or creatively in your writing?
4. When using multimodal elements like voice messages to brainstorm, did you notice yourself thinking differently compared to silent writing? How?
5. Do you feel that these features increase your engagement or motivation in writing tasks? If so, in what ways?
6. Can you share an example of a time when a specific multimodal feature on WeChat improved your understanding or expression of a writing task?
7. What challenges, if any, have you experienced when using WeChat's multimodal functions for your writing, and how did you overcome them?