ISSN: 2716-9189 E-ISSN: 2676-1750
Journal of Studies in Language, Culture, and Society (JSLCS). (08) 01, 2025 (PP. 79-92)
Received: 27/02/2025 Accepted: 09/04/2025 Published: 30/04/2025

LEARNERS' PERCEPTIONS OF GENERATIVE AI IN CHINESE LANGUAGE LEARNING: A PILOT STUDY IN IRISH HIGHER EDUCATION

Hongfei Wang [1]
[1] **Trinity College Dublin (Ireland)**
wangh11@tcd.ie

Abstract: This pilot study explores the integration of Generative AI, specifically ChatGPT, as a Technology-Enhanced Language Learning (TELL) tool in Chinese as an Additional Language (CAL) education in Irish higher education. The study employs qualitative methods to examine interviews with CAL learners from two consecutive groups of the same master's programme to assess evolving perceptions, feedback, and engagement with Generative AI. The first group engaged with ChatGPT shortly after its release, demonstrating a mix of curiosity and scepticism regarding its role in CAL language education. In contrast, the second group interacted with the tool in a context of broader acceptance, perceiving it as a standard educational aid and exhibiting increased confidence and reliance on its functionalities. Comparative analysis highlights a growing recognition of Generative AI as a valuable resource, particularly for real-time feedback and language support. However, persistent concerns remain regarding linguistic accuracy and control in Chinese, underscoring the need for further refinement. By adopting a qualitative approach, this study offers insights into the shifting attitudes of CAL learners toward Generative AI, contributing to ongoing discussions on its pedagogical implications. The findings inform future research aimed at enhancing AI-driven language learning tools to optimize educational outcomes while addressing existing limitations. This study thus advances the understanding of Generative AI's evolving role in facilitating effective Chinese language instruction.

***Keywords**:* Chinese; Generative AI; Higher education; Language Technology; Technology-Enhanced Language Learning (TELL)

How to cite the article :
Hongfei, W. (2025). Learners' Perceptions of Generative AI in Chinese Language Learning: A Pilot Study in Irish Higher Education. *Journal of Studies in Language, Culture, and Society (JSLCS), 8*(1), 79-92.

[1] **Corresponding author:** Hongfei Wang **ORCID ID :** https://orcid.org/0000-0001-7924-2683

1. Introduction

1.1 Background on Chinese Language Education in the Irish Context

In recent years, Chinese language education has gained increasing prominence within the Irish educational context. At the post-primary level, Mandarin Chinese has been incorporated into the Transition Year curriculum (an optional one-year programme in between the Junior Cycle and Senior Cycle that emphasises experiential learning) for over 12 years. Additionally, Short Courses in Chinese Language and Culture have been available in the Junior Cycle (the first three years of post-primary education) for approximately a decade (Zhang & Wang, 2018). In 2020, Mandarin Chinese was officially introduced as a Leaving Certificate subject in the Senior Cycle (the final two to three years of post-primary education), with the first state examination administered in 2022 (DoE, 2017).

In Irish higher education, Chinese language courses are offered in eight universities, either as standalone courses or as components of undergraduate and postgraduate programmes (Zhang & Wang, 2018). These programmes encompass a range of disciplines, including Chinese linguistics, cultural studies, and teacher training.

Despite growing interest in CAL and the institutional support among both the post-primary and higher education, several challenges persist. The linguistic complexity of Mandarin poses significant difficulties for Irish learners, such as its tonal system and logographic script (Wang & Ní Chiaráin, 2019). Limited exposure to the language outside the classroom further constrains students' opportunities for practice (Wang, 2024). While a shortage of qualified teachers further hinders progress (Zhang & Ruddock, 2024). Additionally, adapting Chinese language courses to meet the needs of Irish learners and developing effective assessment methods remain ongoing challenges (Wang, 2024).

Nevertheless, recent advancements in educational technology bring opportunities to enhance CAL. Government initiatives and institutional support have expanded access to Chinese language education at the post-primary level (PPLI, 2023), while technological innovations, including generative AI tools, provide new possibilities for personalised and adaptive learning for CAL learners.

1.2 Generative AI and Language Teaching and Learning

Artificial Intelligence (AI) has increasingly been recognised as a transformative force in education, particularly in language learning (Celik et al., 2022). Within the domain of Chinese language teaching and learning, generative AI tools such as ChatGPT have emerged as valuable assets, it offers personalised learning experiences, automated feedback, and customised instructional support to language learners (Shan et al., 2024; Moorhouse et al., 2024). AI-powered applications can provide real-time feedback on tonal accuracy to facilitate pronunciation practice, assist with character recognition and writing, and generate tailored reading materials and conversational exercises, etc. (Aysu, 2024).

Some research highlights the potential benefits of AI in language learning. Belda-Medina & Calvo-Ferrer's (2022) study indicates that by offering interactive, autonomous learning experiences through AI, learners' engagement and motivation can be improved. AI-driven feedback mechanisms can provide immediate corrections, supporting independent learning and language retention to learners (Kohnke et al., 2023). Moreover, Celik et al. (2022) suggest that AI can assist teachers by automating content creation and assessment, reducing workload while improving differentiation. However, implementing generative AI into language teaching and learning still faces challenges. Concerns regarding linguistic accuracy, as well as over-reliance on AI-generated content and the pedagogical implications of AI-assisted learning, are the key areas of debate (Wang, 2024; Gou, 2025). The successful

implementation of AI tools requires adequate teacher training and careful alignment with established pedagogical frameworks (Moorhouse et al., 2024).

1.3 Rationale, Objectives, and Research Questions

While research on generative AI in language education is expanding, studies specifically examining the use of generative AI in Chinese as an Additional Language (CAL) within the Irish higher education context remain scarce. Existing studies have explored the benefits of AI-driven language learning, yet little is known about how learners in Ireland interact with generative AI tools like ChatGPT in CAL and how learners' perceptions shift over time. This study aims to address this gap by investigating the implications of generative AI in CAL education and learners' perspectives within a master's programme in the Irish higher education context. This pilot study has two key objectives:

1. To examine the current use of Generative AI in a Chinese language programme, focusing on how these tools are integrated into the curriculum.
2. To assess learners' perceptions of generative AI tools, particularly ChatGPT, in their Chinese language learning experiences, focusing on their attitudes, confidence levels, and usage patterns.

Research Questions:

1. To what extent has generative AI been used in the Chinese language programme within the Irish higher education context?
2. How have learners' attitudes towards generative AI tools, particularly ChatGPT, evolved in Chinese language learning two years after its launch?

This pilot study is the initial stage of a series of research projects, providing baseline data, refining research methodologies, and identifying key trends before expanding to additional institutions in Ireland. The findings will contribute to a broader understanding of generative AI's role in CAL education, informing future research and pedagogical strategies.

2. Literature Review

Technology-Enhanced Language Learning (TELL) has transformed language education by integrating digital tools to enhance learner engagement and outcomes. Hasumi and Chiu (2024) systematically reviewed 1,816 publications and found a growing interest in this area. Their study highlights the importance of integrating technology with pedagogical strategies for educational stakeholders, a need that became even more critical during the COVID-19 pandemic.

Generative AI, such as ChatGPT, has become a powerful tool in the language teaching and learning domain. It can offer learners personalised feedback, interactive learning experiences, and real-time language assistance (Kohnke et al., 2023). Its role in second language acquisition continues to evolve, for instance, in the CAL. Understanding learners' perceptions is crucial for assessing Generative AI's effectiveness, identifying challenges, and improving AI-driven pedagogical strategies. Investigating these perceptions provides valuable insights into how students adapt to and benefit from Generative AI, shaping future advancements in language learning technologies.

2.1 Generative AI in Language Teaching and Learning

Generative AI is a transformative tool in language learning, offering innovative ways to enhance linguistic proficiency and engagement. Generative AI tools like ChatGPT provide interactive and personalised learning experiences, enabling learners to practise language skills through real-time conversations, instant feedback, and context-based assistance (Belda-

Medina & Calvo-Ferrer, 2022; Li et al., 2022). Song and Song (2023) highlight the potential of using generative AI in improving learners' writing and pronunciation, providing grammar correction, and fostering independent learning. However, researchers' concerns persist regarding linguistic accuracy, cultural nuances, and excessive dependence on AI-generated content.

Abunaseer (2023) examines the implications of AI technologies, particularly the chatbots utilising large language models in education. The study explores the application of such technologies in AI-based review and assessment of complex student work while also addressing the intrinsic limitations of generative AI. The discussion includes both emerging and potential applications of generative AI in educational settings.

Creely (2024) examines the transformative potential of AI-driven tools in language education. The study highlights how generative AI can create personalised learning experiences through customised content and individualised feedback, thereby facilitating improved language acquisition. However, the research also addresses significant concerns, such as the accuracy and authenticity of AI-generated language, the risk of homogenising linguistic expression, and the propagation of limited cultural narratives. Ethical issues, including the originality of AI-produced work and questions surrounding intellectual property rights, are critically analysed. The study advocates for a balanced approach that harnesses the benefits of generative AI while mitigating its drawbacks, emphasising the need for ethical and transparent practices in integrating generative AI into language learning environments.

Law (2024) conducted a scoping literature review to explore the current state of generative AI applications in language education. Using a qualitative approach, the study focused on four domains: learning, teaching, assessment, and administration. The findings highlight that while generative AI tools such as ChatGPT have become increasingly accessible and have the potential to enhance student motivation and engagement, most discussions and implementations are concentrated in higher education settings. The research emphasises the importance of incorporating generative AI into educational systems to improve student learning outcomes. However, it also underscores the necessity of continuous professional development for educators to ensure informed decision-making and effective AI integration. This review provides valuable insights into the transformative potential of generative AI in language education. By categorising its impact across learning, teaching, assessment, and administration, the study offers a comprehensive overview of its multifaceted applications. The emphasis on professional development is particularly pertinent, as educators must be equipped with the necessary skills and knowledge to effectively integrate these advanced tools into their pedagogy. Moreover, the call for policymakers to promote the incorporation of generative AI reflects a forward-thinking approach to modernising education. As generative AI continues to evolve, ongoing research and dialogue will be essential to navigate its challenges and harness its opportunities in language teaching and learning.

2.2 Learners' Perceptions of Generative AI in Education

Learners' perceptions of AI in education play a crucial role in determining the effectiveness and acceptance of AI-driven tools in learning environments. Al-Badi and Khan (2022) investigate how both learners and instructors view the integration of AI in personalised learning environments. By analysing primary data, the research uncovers variations in sentiments regarding AI's role in tailoring educational experiences to individual needs.

Chan and Hu (2023) explore university students' perceptions of generative AI technologies, such as ChatGPT, in higher education. Their study focuses on students' familiarity, willingness to engage, perceived benefits, challenges, and thoughts on effective AI integration into their learning processes. The research indicates that students' attitudes towards generative AI in education are influenced by factors such as familiarity, perceived

usefulness, and trust in technology. A survey of 399 undergraduate and postgraduate students in Hong Kong found that increased exposure to generative AI tools like ChatGPT led to a generally positive attitude, with students recognising benefits such as personalised learning support and instant feedback.

Initially, many learners approach generative AI with scepticism due to concerns about accuracy, ethical considerations, and potential excessive dependence on AI-generated content. For instance, students have expressed apprehension regarding the reliability of AI-generated content and its impact on academic integrity (Katsantonis & Katsantonis, 2024). However, as AI tools become more integrated into educational settings, students increasingly acknowledge their value in providing personalised learning experiences, instant feedback, and language assistance. This finding echoes another study from Hong Kong which reported that students appreciated generative AI's role in enhancing their learning processes despite initial reservations (Chan & Hu, 2023).

2.3 Generative AI in CAL in the Irish Higher Education

In recent years, practitioners and researchers have shown increasing interest in applying Computer-Assisted Language Learning (CALL) in Chinese language education within the Irish higher education context. Li et al. (2018) examine how digital tools enhance international Chinese education in Ireland. Their study highlights the benefits of multimedia resources, online platforms, and virtual classrooms in increasing student engagement. However, challenges such as insufficient technical support and varying digital literacy levels among teachers and students persist. The authors recommend strengthening teacher training, improving technological infrastructure, and adapting teaching methods for diverse learners. Their research underscores the growing importance of digital education and the need for effective integration to enhance teaching quality and support the global expansion of Chinese language learning.

Wang and Devitt (2022) systematically reviewed Computer-Mediated Communication (CMC) in Chinese as a Foreign Language (CFL) education from 2008 to 2022. Analysing 68 empirical studies, they explored research contexts, theoretical foundations, methodologies, and CMC's impact on language learning. Their findings highlight CMC's role in enhancing engagement, authentic communication, and intercultural competence, particularly among adult beginners in formal settings. While CMC offers learner-centred benefits, challenges include technological barriers and limited research on advanced or younger learners. The study calls for broader participant diversity and expanded research to fully assess CMC's role in CFL acquisition.

Wang (2024) focuses on the design and evaluation of Intelligent Computer-Assisted Language Learning (ICALL) tools tailored for beginner learners of Mandarin Chinese. Her research addresses the integration of AI technologies, such as Natural Language Processing (NLP), Intelligent Tutoring Systems (ITSs), and Automated Speech recognition (ASR), etc. to create interactive and personalised learning experiences for CAL learners. These AI-driven tools aim to enhance learner engagement, provide real-time feedback, and facilitate authentic language use, thereby improving proficiency for beginner learners.

However, although generative AI has been implemented in some aspects of Chinese language teaching, research on its effectiveness remains at an early stage, with limited studies and publications available. Thus, this is a prominent area requiring further research, especially for empirical studies.

2.4 Research Gaps and Future Directions

Existing literature underscores the potential of generative AI in language learning, highlighting both its benefits and challenges. However, research on its application in CAL, particularly within the Irish higher education context, remains limited. While some studies

emphasise the advantages of AI-driven feedback, independent learning, and engagement, concerns regarding excessive dependence, accuracy, and integration into pedagogical strategies persist (Chan & Hu, 2023).

This study seeks to address these gaps by exploring how learners perceive and interact with generative AI in CAL education in the Irish Higher Education context. Future research should focus on empirical investigations into generative AI's effectiveness, learner adaptation strategies, and best practices for integration. Additionally, further studies should examine educators' roles in facilitating AI-based learning and the long-term impact of generative AI on language proficiency. Advancing this research area will help shape effective AI-driven pedagogical models for Chinese language education, ensuring a balanced and informed approach to technology-enhanced language learning.

3. Methodology

3.1 Research Design and Participants

This pilot study employs a qualitative research design, using semi-structured interviews to examine how Chinese as an Additional Language (CAL) learners perceive, engage with, and respond to generative AI, particularly ChatGPT, over time. The study focuses on two academic cohorts (2022/23 and 2023/24) enrolled in a master's programme, enabling a comparative analysis of shifting attitudes and interactions with AI-driven language tools.

By comparing these cohorts, the research aims to track changes in learners' perceptions, strategies, and the perceived effectiveness of generative AI in CAL learning.

The study is conducted within the MPhil in Chinese Studies programme, with participants drawn from two consecutive cohorts:

- Group 1 (n=3): This group encountered ChatGPT soon after its release, engaging with it as an experimental tool.
- Group 2 (n=2): This group used ChatGPT at a time when it had become more widely accepted.

Participants exhibit proficiency levels ranging from CEFR B1 to C1, ensuring a diverse sample representing varying levels of linguistic competence and engagement with generative AI. This range enables an analysis of how intermediate learners may rely more on generative AI for structural and lexical support in contrast advanced learners may utilise it for nuanced linguistic and cultural exploration.

While the participant sample is small (n=5), this pilot study serves as an initial exploration of CAL learners' interactions with generative AI, laying the groundwork for future large-scale research. Despite the limited sample, key themes emerged, suggesting a degree of data saturation (Guest et al., 2006). However, further studies with larger and more diverse cohorts are needed to confirm these findings.

3.2 Data Collection Methods

This study implements a multi-method qualitative approach to examine how CAL learners engage with generative AI in their Chinese writing. The data collection process includes task-based assessments, text comparisons, and semi-structured interviews, facilitating a comprehensive analysis of learner experiences, attitudes, and outcomes.

Writing Tasks: Using ChatGPT to Facilitate Chinese Writing

Participants complete writing tasks throughout their coursework, using ChatGPT for assistance, feedback, and revision. The study compares different text versions to analyse generative AI's influence on writing development:

- Students' Original Versions (SOV): Initial drafts produced by students without Generative AI assistance.

- Teacher's Correction Versions (TCV): Instructor-provided feedback and corrections on student drafts.
- ChatGPT's Correction Versions (GCV): AI-generated feedback and corrections based on students' original draft.
- ChatGPT-Generated Versions (GGV): Entirely AI-generated writing samples, used for comparison with student-authored texts.

When analyzing these versions, the study identifies patterns of improvement, alignment between generative AI and teacher feedback, and students' trust in AI-generated corrections.

Focus Group and Semi-Structured Interviews

Following the writing tasks, participants take part in focus group discussions, adopting Morgan's (1996) focus group methodology. This approach encourages interactive discussions, allowing participants to reflect on their experiences with Generative AI in a collaborative setting. The focus group is complemented by semi-structured interviews, which provide deeper insights into students' perceptions, challenges, and evolving attitudes toward Generative AI assisted language learning. The interviews cover key themes:

(a) General experience with Generative AI
(b) Evaluating AI-generated feedback and its integration into learning
(c) Challenges and comparisons between Generative AI and human feedback
(d) Linguistic and sociocultural awareness, including concerns of over-reliance on Generative AI

3.3 Methods for Data Analysis

A thematic analysis approach is used to examine patterns and trends within the collected data. The analysis includes:

- Comparative text analysis: A systematic examination of differences and similarities among SOV, TCV, GCV, and GGV to identify trends in writing development, the effectiveness of Generative AI, and error correction strategies.
- Qualitative coding of interview transcripts: A structured coding process is applied to interview transcripts to identify recurring themes, participant attitudes, and behavioural shifts in student interactions with Generative AI.
- Cross-cohort analysis: A comparative analysis between Group 1 and Group 2 to assess changes in perceptions and engagement over time.

Thematic analysis was conducted following Dörnyei's (2007) framework, involving transcribing the data, pre-coding & coding, growing ideas, and drawing conclusions. Coding was performed manually using *MindMaster* to track themes and patterns in interview transcripts. The analysis follows the structured qualitative framework, enabling a comprehensive exploration of how Generative AI shapes CAL learners' writing processes, confidence, and perceptions. Findings will contribute to broader discussions on the pedagogical implications of AI-driven CAL language learning.

3.4 Ethical Considerations

This study follows ethical guidelines to ensure participant confidentiality, informed consent, and responsible data handling. Before participation, all participants received detailed informed consent forms, outlining the study's objectives, voluntary participation, and their right to withdraw at any time. Data confidentiality is maintained by anonymizing all responses and textual data, ensuring that student identities remain protected. Ethical approval was sought from the institutional Research Ethics Committee, ensuring compliance with research ethics standards.

4. Results

The researcher utilised the mind-mapping software MindMaster to store and analyse the interview transcripts. Following a thematic analysis, key themes were identified and categorized. *Table 1* presents the findings, with the first column listing key aspects and the subsequent columns summarizing responses from the two participant groups.

Table 1

Key Findings of the Interviews

Aspect	Group 1 (2022/23)	Group 1 (2023/24)
Initial Purpose of Generative AI Use	Proofreading emails, checking grammar, and planning essays.	Writing speeches, preparing interview questions, and general language improvement.
Experience Level with Generative AI	Initially struggled to understand how to use it effectively but learned quickly.	More experienced, using generative AI for various tasks, demonstrating confidence in the tool.
Language Usage	Used primarily for English emails and academic writing.	Utilized for writing in both Chinese (for speeches) and English (for interview questions).
Feedback on Generative AI Understanding	Felt that ChatGPT did not fully understand the context at times; required detailed input.	Also noted the need for detailed instructions but found overall understanding improved with practice.
Perception of Output Quality	Surprised by the quality of AI-generated text; found it helpful overall.	Generally found the output useful, especially for enhancing language proficiency.
Concerns About Over-reliance	Expressed cautious use; felt they used it wisely.	Acknowledged frequent use but emphasized using it as an assistant rather than a crutch.
Integration of Generative AI Feedback	Used Generative AI outputs as references to improve their own writing.	Also used AI-generated content as a reference, but actively reconstructed sentences to fit personal style.
Language Proficiency Impact	Believed that their language skills improved with Generative AI assistance.	Also felt that their proficiency improved, with a focus on matching Generative AI output to their own levels.
Challenges with Generative AI Output	Struggled with AI-generated sentences being too advanced for their level.	Faced similar challenges but had developed strategies for adapting output to match their proficiency.
Perceived Drawbacks of Generative AI	Recognised limitations in Generative AI's ability to assess individual language levels accurately.	Identified potential errors in AI-generated content as a significant drawback.
Future Plans with Generative AI	Planned to continue using Generative AI as a supportive tool.	Expressed intention to keep using it, especially with new features like voice mode for learning.

A comparative analysis of the two cohorts reveals a notable shift in attitudes toward Generative AI in CAL learning (See *Table 2*):

Table 2

Shifts in Learner Attitudes Towards AI

Aspect	Group 1 (2022/23)	Group 2 (2023/24)
Initial Attitudes	Cautious, sceptical about Generative AI's ability	More accepting, and confident in Generative AI's role
Usage	Mainly proofreading and grammar check	Writing, vocabulary, more advanced tasks
Concerns	Over-reliance, formal language	Matching complexity to proficiency
Outcome	Hesitant use, still preferred human feedback	More integration into the learning process

The interview results show that learners' attitudes toward generative AI have shifted significantly over time (see Table 2). Group 1 was initially cautious about AI and expressed doubts about its ability to effectively support Chinese language learning. Their use of generative AI was mainly limited to proofreading and grammar checking, and they remained concerned about over-reliance on AI-generated content and its overly formal nature. As a result, they showed a preference for human feedback and were hesitant to adopt generative AI tools.

In contrast, Group 2 shows greater confidence in the role of generative AI, using it for more advanced tasks such as writing assistance and vocabulary expansion. This group also shows greater adaptability, improving AI-generated content to better match their proficiency level. While concerns remained - particularly regarding the need to calibrate the complexity of generative AI output - learners in this group were more willing to incorporate generative AI into their language learning strategies.

These trends suggest that learners develop more strategic and effective AI usage habits with increased exposure, which emphasizes the importance of AI literacy in maximizing the benefits of AI-assisted learning.

5. Discussion

The emergence of generative AI tools has significantly impacted Chinese language teaching and learning over the past two years, with learners demonstrating predominantly positive attitudes towards these innovations while maintaining nuanced perspectives on their implementation. Analysing the data from both groups reveals several interconnected themes regarding generative AI integration in CAL learning, including perceived benefits, learner adaptation strategies, implementation challenges, the complementary role of human instruction, and future adoption patterns.

5.1 Perceived Benefits and Usefulness

The study found that learners across both groups leveraged Generative AI for a range of Chinese language learning activities, aligning with Research Question 1.

The key benefits identified in the findings (see *Table 1*) include: (a) Writing Assistance: Learners used Generative AI for proofreading, grammar correction, and structured essay planning. This was particularly emphasized by group 1, who initially used the tool for

basic writing tasks such as writing emails in Chinese. (b) Content Development: Group 2 demonstrated broader use, they are employing Generative AI for speech writing in Chinese, interview preparation, and nuanced content refinement in both Chinese and English. (c) Language Enhancement: Participants across both groups reported improvements in Chinese vocabulary acquisition and linguistic expression, particularly when using Generative AI for sentence restructuring and style refinement to their own drafts.

These findings align with previous research on generative AI's potential to enhance learner autonomy and linguistic competence in second-language acquisition. AI-driven tools can foster self-regulated learning and provide customised learning pathways, thereby promoting learner independence and improving language proficiency (Mohebbi, 2025). However, the data also suggest that the effectiveness of Generative AI in language learning is contingent on how learners interact with and integrate these tools into their study practices (Alm, 2024).

5.2 Learner Adaptation and Control

Findings also revealed how learners actively shaped their generative AI usage strategies, directly addressing Research Question 2.

Group 1 initially encountered challenges with generative AI's overly formal outputs, requiring time to refine their prompts for more suitable responses. In contrast, Group 2 adopted a more sophisticated and proactive approach, modifying AI-generated content to better align with their writing styles and proficiency levels.

These results suggest that increased familiarity with generative AI tools fosters more strategic and effective usage over time. This aligns with existing research, which underscores the importance of generative AI literacy in maximising the effectiveness of AI-assisted learning (Chan & Hu 2023).

5.3 Challenges and Limitations

Despite the benefits of generative AI, learners also identified significant challenges in incorporating generative AI into language learning. A major concern was overreliance, particularly in Group 1, which could hinder independent language development. Additionally, both groups noted inconsistencies in AI-generated output, with ChatGPT responses often vacillating between being too complex and too simple.

Ethical issues also surfaced, particularly around academic integrity. Some learners were unsure of the boundaries of acceptable AI use in writing tasks, raising concerns about originality and plagiarism. These findings align with broader debates about the ethical use of AI in education, with scholars warning of the risks of uncontrolled reliance on AI (Cotton et al., 2024).

To address these challenges, AI should be used as an aid rather than a replacement for human instruction. Developing AI literacy frameworks and institutional guidelines could help learners engage critically with AI while maintaining academic integrity (Rasul et al, 2024).

5.4 Comparisons with Human Feedback

A significant theme emerging from the study was the complementary relationship between AI-generated feedback and human instruction. This finding directly relates to Research Question 2, as it highlights the limitations of AI-only learning approaches from students' perspectives.

Learners across both cohorts valued generative AI's immediate accessibility but consistently preferred human instructors for feedback on cultural nuances, contextual accuracy, and linguistic precision. Group 2 recognised that generative AI tools lacked the

depth of personalised feedback that instructors provided, reinforcing the importance of human-AI collaboration in language education.

These findings support prior research suggesting that generative AI tools should be integrated as supplements rather than replacements for human instruction (Dickey& Bejarano, 2023).

5.5 Attitude Toward Continued Use

Despite the challenges, the study found a clear trajectory towards greater generative AI adoption in language learning. This directly addresses Research Question 2.

Group 1 initially approached generative AI with scepticism and caution, using it primarily for proofreading and minor grammar corrections (see *Table 2*). In contrast, Group 2 demonstrated a greater willingness to integrate generative AI into a broader range of learning activities, reflecting growing confidence and adaptation strategies.

Interest in emerging generative AI features, such as ChatGPT's voice mode, suggests that learners are actively exploring new functionalities to enhance their language skills.

These findings contribute to our understanding of how generative AI tools are reshaping language learning practices while highlighting the importance of maintaining a balanced approach that leverages both technological innovation and traditional pedagogical methods.

5.6 Technical Limitations of Generative AI in Mandarin and Potential Solutions

While generative AI has shown great promise for language learning, applying it to Mandarin Chinese presents unique technical challenges. One major limitation is that AI has difficulty accurately processing and generating tone differences, which are critical for distinguishing meaning in Mandarin Chinese. Unlike alphabet-based languages, Mandarin Chinese relies on four main tones, and misunderstandings can lead to significant misunderstandings. Current AI models, including ChatGPT, often struggle to provide precise tonal feedback, limiting their effectiveness in pronunciation training.

One potential solution is to fine-tune AI models using larger, higher-quality Mandarin Chinese datasets, emphasizing tone accuracy, syntax, and pragmatic usage. Enhanced speech recognition algorithms combined with speech analysis and tone correction could further improve AI's ability to support pronunciation learning. Furthermore, combining AI-driven language models with existing computer-assisted pronunciation training (CAPT) tools could create a more comprehensive and effective learning experience (Amrate & Tsai, 2024).

Through the overcoming of these limitations via targeted model improvements and multimodal AI integration, generative AI could evolve into a more reliable tool for Mandarin acquisition. Future research should explore the feasibility of custom-trained AI models designed specifically to overcome these linguistic and cultural barriers.

6. Conclusion and Limitations

This study provides insights into the evolving role of Generative AI in Chinese language education within Irish higher education, highlighting key transformative patterns in learner engagement and perception.

First, there has been a marked evolution in learner acceptance of generative AI tools. The progression from initial scepticism to informed adoption suggests a maturing relationship between learners and generative AI technology. This shift reflects not only increased comfort with the tools but also a more sophisticated understanding of their capabilities and limitations within the language learning context.

Second, learners have developed a nuanced, balanced approach to generative AI integration. Rather than viewing AI as a replacement for traditional learning methods, they have positioned it as a complementary tool within their broader learning strategy. This hybrid approach maintains the irreplaceable value of human instruction while leveraging AI's

capabilities for immediate feedback and practice opportunities. The complementary role of generative AI assistance and human guidance has emerged as a crucial factor in successful language acquisition.

Third, emerging generative AI capabilities, particularly in areas such as voice interaction, signal expanding possibilities for Chinese language education. These developments suggest a trajectory towards more immersive and interactive learning experiences that could significantly enhance the acquisition of tonal languages like Chinese. The enthusiasm shown by learners for these new features indicates the potential for deeper generative AI integration in language pedagogy.

However, the success of these developments will depend on maintaining the balanced approach identified in this study - one that leverages generative AI's capabilities while preserving the crucial role of human instruction and interaction in language learning.

Despite these insights, the study has several limitations. First, it relies on self-reported data, which may introduce subjective bias. Future research should adopt a mixed-methods approach, incorporating quantitative proficiency metrics to assess generative AI's impact on language acquisition more objectively. Additionally, the study's small-scale pilot sample limits the generalizability of findings. Expanding the research across diverse educational contexts and conducting longitudinal studies would provide a more comprehensive understanding of generative AI's role in language learning.

Addressing these limitations will contribute to a more nuanced understanding of how generative AI can be effectively integrated into second-language education, ensuring its responsible and pedagogically sound use.

This research contributes to our understanding of how technological innovation intersects with pedagogical practice in language education. As generative AI tools continue to evolve, further research will be valuable in examining how these developments influence learning outcomes and pedagogical approaches in Chinese language education within Irish higher education and beyond.

References

Abunaseer, H. (2023). The use of generative AI in education: Applications, and impact. *Technology and the Curriculum: Summer 2023*.

Al-Badi, A., & Khan, A. (2022). Perceptions of learners and instructors towards artificial intelligence in personalized learning. *Procedia computer science*, *201*, 445-451. https://doi.org/10.1016/j.procs.2022.03.058

Alm, A. (2024). Exploring Autonomy in the AI Wilderness: Learner Challenges and Choices. *Education Sciences*, *14*(12), 1369. https://doi.org/10.3390/educsci14121369

Amrate, M., & Tsai, P. H. (2024). Computer-assisted pronunciation training: A systematic review. ReCALL, 1-21. https://doi.org/10.1017/S0958344024000181

Aysu, S. (2024). The use of AI-Powered Tools in Language Learning. *Dil Eğitimi ve Öğretiminde*, 1. https://doi.org/10.58830/ozgur.pub476

Belda-Medina, J., & Calvo-Ferrer, J. R. (2022). Using chatbots as AI conversational partners in language learning. *Applied Sciences*, *12*(17), 8427. https://doi.org/10.3390/app12178427

Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The promises and challenges of artificial intelligence for teachers: A systematic review of research. *TechTrends*, *66*(4), 616-630. https://doi.org/10.1007/s11528-022-00715-y

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, *20*(1), 43. https://doi.org/10.1186/s41239-023-00411-8

Cotton, D. R., Cotton, P. A., & Shipway, J. R. (2024). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in education and teaching international*, 61(2), 228-239. https://doi.org/10.1080/14703297.2023.2190148

Creely, E. (2024). Exploring the role of generative AI in enhancing language learning: Opportunities and challenges. *International Journal of Changes in Education*, *1*(3), 158-167. https://doi.org/10.47852/bonviewIJCE42022495

Department of Education and Skills. (2017). Languages connect: Ireland's strategy for foreign languages in education, 2017–2026. *Department of Education and Skills*. Retrieved from https://assets.gov.ie/289094/0b705914-81d1-4951-8f96-ae8c57d7bc15.pdf

Dickey, E., & Bejarano, A. (2023). GAIDE: A Framework for Using Generative AI to Assist in Course Content Development. *arXiv preprint arXiv:2308.12276*. https://doi.org/10.48550/arXiv.2308.12276

Dörnyei, Z. (2007). Research Methods in Applied Linguistics: Quantitative, Qualitative and Mixed Methodologies. Oxford: Oxford University Press. https://doi.org/10.4000/asp.294

Gou, D. (2025). The Potential, Challenges, and Pathways of Generative Artificial Intelligence in Empowering the *Studies*, *2*(2), 104-115. https://doi.org/10.71113/JCSIS.2025v2i2.104-115

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field methods, 18*(1), 59-82. https://doi.org/10.1177/1525822X05279903

Hasumi, T., & Chiu, M. S. (2024). Technology-enhanced language learning in English language education: Performance analysis, core publications, and emerging trends. *Cogent Education*, *11*(1), 2346044. https://doi.org/10.1080/2331186X.2024.2346044

Katsantonis, A., & Katsantonis, I. G. (2024). University students' attitudes toward artificial intelligence: An exploratory study of the cognitive, emotional, and behavioural dimensions of AI attitudes. *Education Sciences*, *14*(9), 988. https://doi.org/10.3390/educsci14090988

Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). ChatGPT for language teaching and learning. *Relc Journal*, *54*(2), 537-550. https://doi.org/10.1177/00336882231162868

Law, L. (2024). Application of generative artificial intelligence (GenAI) in language teaching and learning: A scoping literature review. *Computers and Education Open*, 100174. https://doi.org/10.1016/j.caeo.2024.100174

Li, L., Zhang, C., Xie, X., Wang, H., & Wang, J. (2018). *An analysis of the application of digital methods to international Chinese pedagogy.* Foreign Language Teaching & Research Press.

Li, Y., Chen, C. Y., Yu, D., Davidson, S., Hou, R., Yuan, X., ... & Yu, Z. (2022, June). Using chatbots to teach languages. In *Proceedings of the Ninth ACM Conference on Learning@ Scale* (pp. 451-455). https://doi.org/10.1145/3491140.3528329

Mohebbi, A. (2025). Enabling learner independence and self-regulation in language education using AI tools: a systematic review. *Cogent Education*, *12*(1), 2433814. https://doi.org/10.1080/2331186X.2024.2433814

Moorhouse, B. L., Wan, Y., Ho, T. Y., & Lin, A. M. (2024). Generative AI-assisted, evidence-informed use of L1 in L2 classrooms. *ELT Journal*, *78*(4), 453-465. https://doi.org/10.1093/elt/ccae033

Morgan, D. L. (1996). Focus groups. *Annual review of sociology*, *22*(1), 129-152. https://doi.org/10.1146/annurev.soc.22.1.129

Post-Primary Languages Ireland. (2023). Annual Report 2023. Retrieved from https://ppli.ie/publications/

Rasul, T., Nair, S., Kalendra, D., Balaji, M. S., de Oliveira Santini, F., Ladeira, W. J., ... & Hossain, M. U. (2024). Enhancing academic integrity among students in GenAI Era: A holistic framework. *The International Journal of Management Education*, 22(3), 101041. https://doi.org/10.1016/j.ijme.2024.101041

Shan, L., Pan, Z., & Weidman, R. (2024). Integrating Task-Based Language Teaching and Generative AI: Design, Implementation, and Evaluation of the CFLingo Platform for Chinese Learning. *Journal of Technology & Chinese Language Teaching*, *15*(2).

Song, C., & Song, Y. (2023). Enhancing academic writing skills and motivation: assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. *Frontiers in Psychology*, *14*, 1260843. https://doi.org/10.3389/fpsyg.2023.1260843

Wang, H. (2024). *The Design and Evaluation of Intelligent Computer-Assisted Language Learning Tools for Beginner Learners of Mandarin Chinese* (Doctoral dissertation, Trinity College, Dublin).

Wang, H., & Chiaráin, N. N. (2019). Towards the design of iCALL tools for beginner mandarin Chinese learners in Ireland. *CALL and complexity*, 385. https://doi.org/10.14705/rpnet.2019.38.1041

Wang, M., & Devitt, A. (2022). A systematic review of computer-mediated communications in Chinese as a foreign language from 2008 to 2022: Research contexts, theoretical foundations and methodology, affordances and limitations. *Language Teaching Research*, 13621688221132475. https://doi.org/10.1177/13621688221132475

Zhang, C., & Ruddock, K. (2024). Bridging Gaps and Building Futures: Establishing initial teacher education for Asian languages in Ireland. *TEANGA, the Journal of the Irish Association for Applied Linguistics*, *31*, 231–255. https://doi.org/10.35903/teanga.v31i.7643

Zhang, C., & Wang, H. (2018). The development of Chinese language education in Ireland: Issues and prospects. *TEANGA, the Journal of the Irish Association for Applied Linguistics*, *25*, 34-51. https://doi.org/10.35903/teanga.v25i0.48