

**Generative AI in Academic Chinese Writing for Native speakers:**

**A Case Study of ChatGPT and Ernie Bot**

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The integration of Generative Artificial Intelligence (GenAI) has significantly transformed language teaching and learning. Since the introduction of ChatGPT in November 2022, academic writing has experienced notable changes, leading to varied institutional responses. While some institutions have restricted the use of GenAI, many students have adopted it as a writing assistant in their coursework. This reality necessitates examining how GenAI can be effectively integrated into education rather than simply restricted.

This study examines GenAI's role in an academic Chinese writing education for native Chinese speakers<sup>1</sup> at a Hong Kong university. Academic Chinese, characterized by its formal tone, precise vocabulary, and intricate sentence constructions, presents distinct challenges for both learners and educators. Through systematic evaluation of GenAI tools across various aspects of academic Chinese writing, this study identifies opportunities and challenges for effective GenAI integration in this educational context.

## **Literature Review**

### **GenAI in Language Education and Academic Writing**

The integration of GenAI into education has expanded rapidly in recent years. Research has shown that GenAI are increasingly used to support teaching and learning because of its capacity to process natural language, personalize responses, and operate interactively (Aktay & Uzunoğlu, 2023; Baidoo-Anu & Owusu Ansah, 2023; Giannakos et al., 2025; Tlili et al., 2023). GenAI have been incorporated into a range of instructional settings, where it is reported to assist with content delivery, provide individualized guidance, and help students engage more actively with course materials (Noroozi et al., 2024; Faisal Rashid et al., 2024).

Within this broader trend, GenAI has gained particular attention in the field of language education. Studies highlight its potential as an adaptive learning aid, as its adaptive and interactive features can foster personalized learning, improve writing skills, and enhance student engagement

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<sup>1</sup> The course involved in this study is designed for native Chinese-speaking students, regardless of whether they speak Mandarin or Cantonese.

(Jeon & Lee, 2023; Jeon, Lee, & Choi, 2024; Law, 2024). Because of its dialogic interface, ChatGPT can simulate conversational interaction, generate alternative expressions, and offer instant feedback on learners' writing. Hong (2023) further points out that ChatGPT brings together the functions of common tools such as Grammarly, Google Translate, and Wikipedia, giving learners faster access to feedback and explanations. Rather than replacing teachers, it expands assisted learning by providing more immediate and interactive support than earlier technologies (Hong, 2023). Building on this wider shift in language education, researchers have increasingly focused on academic writing. In this area, GenAI is commonly discussed as a writing assistant that can support various stages of the writing process. Empirical studies report that tools such as ChatGPT are used for generating preliminary drafts, brainstorming arguments, organizing ideas, and summarizing academic sources (Dönmez et al., 2023; Imran & Almusharraf, 2023; Malik et al., 2023). Overall, the literature suggests that GenAI serves as an effective and accessible tool in language education and academic writing, helping learners engage more interactively, receive personalized feedback, and manage key stages of the writing process more effectively.

### **GenAI in Chinese Writing Context**

Research on academic Chinese writing has primarily focused on teaching Chinese as a second language to international students, addressing topics including curriculum design, writing needs, discourse analysis and peer feedback (Li et al., 2020; Lü et al., 2022; Shu, 2025). Studies specifically researching native Chinese speakers' academic writing remain limited, with only sporadic discussions such as Kong and Li (2017), which analyzed vocabulary selection patterns among students from different majors. Recent studies have begun to explore GenAI applications in Chinese writing contexts, though research specifically addressing academic writing remains limited. Existing empirical studies focus primarily on business writing and creative writing, offering indirect insights for academic writing applications.

Du et al. (2025) examined GenAI's application within a Chinese writing course, concluding that its integration had positive effects and received generally positive student evaluations. The

study also found that using GenAI was helpful for document generation but limited in analyzing complex grammatical issues. While this research provides valuable empirical support for the positive potential of GenAI in Chinese writing classroom, as business Chinese and academic Chinese are distinct genres, there remains a persistent gap concerning the effectiveness of GenAI in academic Chinese writing.

Liang (2025) shares methodological commonalities with our research by employing a case study approach to examine GenAI applications in the Chinese writing context. However, the study focuses on the “Erya (爾雅)” system, a CUHK-developed GenAI platform specifically designed for Chinese writing assistance, to analyze its differences from conventional AI, rather than comprehensively evaluating GenAI’s overall utility. Moreover, Liang’s testing framework emphasizes creative writing instead of academic writing. Liang’s findings suggest that the Erya system’s responses remain largely extensions of conventional AI answers, indicating no substantial change in core functionality. This observation reinforces the continued relevance and necessity of our research, which provides a comprehensive examination of GenAI’s role specifically in academic writing.

### **Challenges and Limitations of GenAI in Academic Writing**

The literature reviewed in the preceding sections reveals significant challenges and limitations when implementing GenAI in academic writing contexts. Imran and Almusharraf (2023) contend that ChatGPT lacks access to the most current information and references, whereas human writers can draw upon a broader knowledge base and insights derived from their expertise. Chen and Gong (2025) highlighted that GenAI may generate non-existent or unverified articles in response to writers’ requests. Additionally, implementation in educational settings shows that GenAI fails to analyze complex grammatical issues, which presents significant limitations for academic writing contexts that require sophisticated understanding of grammatical structures and linguistic nuances. The literature emphasizes that GenAI cannot replicate the diverse skill set and knowledge base of a human writer, nor should it replace human creativity and expertise.

Beyond these technical and pedagogical limitations, practical challenges and ethical concerns include issues such as academic dishonesty, educational inequality, data accuracy, and plagiarism-related issues (Law, 2024; Zhao et al., 2025). These multifaceted challenges underscore the complexity of integrating GenAI into the teaching and learning of academic writing.

### **Research Gaps and Research Questions**

Despite extensive discourse on the benefits and limitations of GenAI, there is limited research on integrating GenAI into Chinese-language academic writing instruction. While some qualitative studies have explored GenAI's role in supporting Chinese students' English academic writing (Hongxia & Razali, 2025; Song & Song, 2023), research specifically addressing Chinese-language academic writing for native speakers remains largely absent. Given that numerous studies and discussions have predominantly focused on the English context and non-academic aspects, there is a notable gap in exploring GenAI's application in academic Chinese education.

Beyond the linguistic scope, current studies provide limited practical guidance on GenAI integration, remaining largely theoretical without concrete implementation examples. The few studies with practical applications focus on business or creative writing contexts rather than academic writing. These gaps highlight the need for research that addresses practical GenAI applications in academic Chinese writing for native speakers, with emphasis on implementation examples and pedagogical strategies. Additionally, existing studies typically examine single GenAI platforms, leaving open the question of whether different tools perform consistently in this context.

This study aims to bridge this gap by examining GenAI's application in academic Chinese writing for native speakers, addressing three research questions: (1) How do different GenAI tools compare in assisting with academic Chinese writing tasks? (2) What are the capabilities and limitations of GenAI in assisting with content, structure, and language use in academic Chinese writing? (3) What pedagogical implications emerge from these findings for teaching academic

Chinese? By addressing these questions, this study contributes to understanding GenAI's role in academic Chinese writing education and provides concrete guidance for educators and students.

## **Methodology**

### **Background**

The initial material of the research largely originated from the development of course materials for a course titled “Chinese Communication Skills for Humanities & Social Science Studies”. The course is offered to undergraduate students majoring in Global China Studies by the Center for Language Education at the Hong Kong University of Science and Technology. All students are native Chinese (Mandarin or Cantonese or both) speakers. In the process of developing new teaching materials, the focus has been on integrating GenAI tools into the learning process. This integration aims to empower students to effectively use technology to improve their academic Chinese writing skills, with a specific emphasis on title formulation, introduction, and literature review sections of academic papers.

To provide context for our evaluation criteria, it is important to note how student writing is assessed in the course. In this assignment, students' writing is evaluated across three aspects: content, structure, and language. Specifically, the evaluation of content focuses on the clarity of the writing topic with a well-defined background introduction, the appropriateness and richness of cited literature, and the adequacy of summarization, analysis, and evaluation of the literature to establish relevant connections between past literature and the student's research. For structure, the assessment considers the clarity and suitability of the overall writing organization, the logical coherence of sentences and paragraphs, and the accurate and consistent provision of source citations. In terms of language, the assessment examines writing fluency, the conciseness and accuracy of word and sentence usage, and adherence to academic conventions in language. Throughout the development of new course materials integrating GenAI, our focus has been on how GenAI tools can assist students in improving their writing performance in these three aspects.

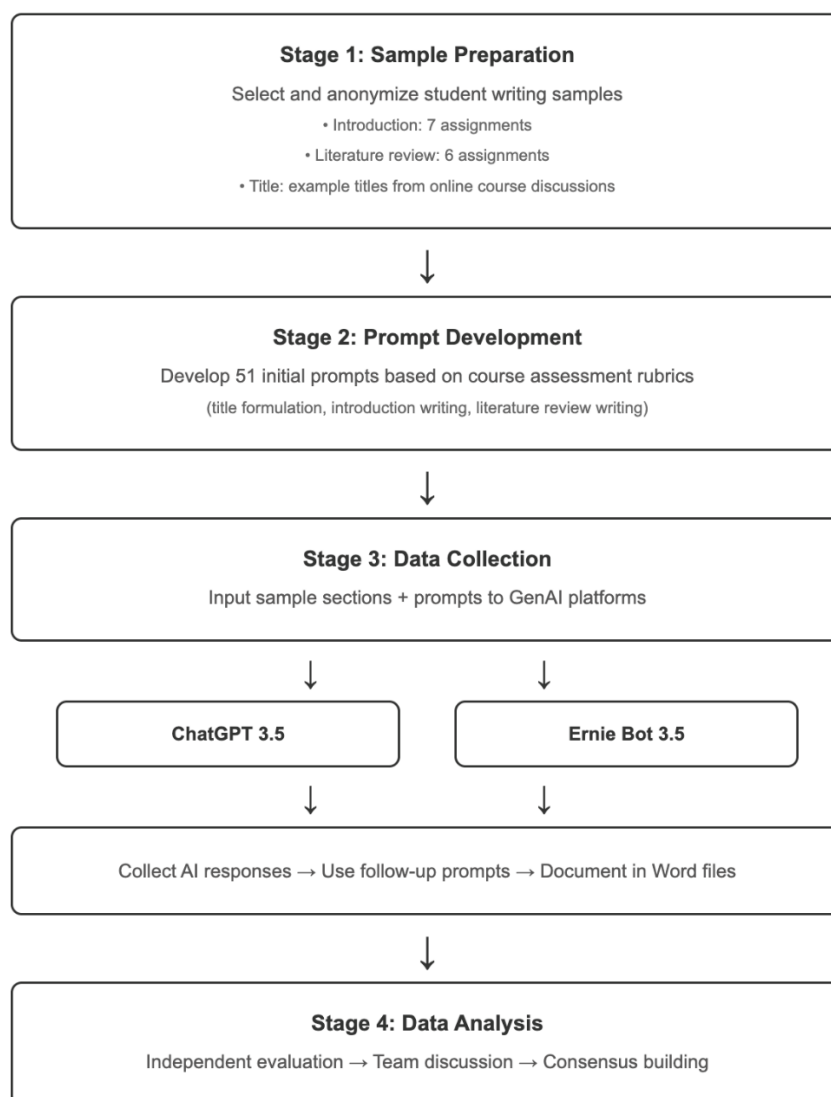
## Research Design

This study employs a qualitative exploratory case study approach to examine GenAI tool performance across different academic Chinese writing tasks. The case is defined as the integration of GenAI tools in an undergraduate academic Chinese writing course. Following Yin's (2018) emphasis on bounding the case, this study establishes boundaries across several dimensions: temporally, student writing samples were drawn from Fall 2022 and 2023; institutionally, the case is situated within the Center for Language Education at the Hong Kong University of Science and Technology; technologically, the study examines ChatGPT 3.5 and Ernie Bot 3.5; and in terms of task scope, the focus is limited to title formulation, introduction, and literature review sections of academic papers. Within this bounded case, the unit of analysis is GenAI tool performance across different prompts and writing tasks. Performance is evaluated using three criteria derived from course objectives: content, structure, and language use.

## Research Tools

ChatGPT, developed by OpenAI, is proficient in producing human-like text responses, while Ernie Bot, known as “Wenxin yiyan (文心一言)” in the Chinese community, and created by Baidu, offers similar capabilities but is particularly focused on generating text in Chinese. At the time of our investigation, version 3.5 was the most advanced freely available version for both ChatGPT and Ernie Bot. The intentional decision to use the free versions of these tools was made to enhance accessibility, as we aimed to provide broad access for educators and learners, thereby promoting their effective engagement with these technologies.

## Sampling and Data Sources



**Figure 1.** Overview of sampling, data collection, and data analysis process

This study involves two types of materials: student writing samples as input materials and AI-generated responses as the primary data for analysis. An overview of the research design is presented in Figure 1. Student writing samples were drawn from 13 assignments submitted during Fall 2022 and 2023 in the academic Chinese writing course, representing diverse humanities and social science disciplines including education, communication, politics, economics, psychology, and sociology. All samples came from undergraduate students in the Global China Studies program, primarily second-year students taking this required course. The first author, who had taught this course for several years and provided written feedback on student assignments, selected samples

through purposive sampling based on their representation of typical weaknesses that students commonly exhibit in academic Chinese writing. Drawing on recurring patterns observed in written feedback over the years, the first author identified these weaknesses across three dimensions: content (e.g., insufficient evidence and lack of critical engagement with sources), structure (e.g., unclear thesis statements and weak logical transitions), and language (e.g., inappropriate register and grammatical errors). Prior to use, all identifying information was removed from the samples to ensure anonymity.

The primary data for analysis consisted of AI-generated responses. For introduction and literature review tasks, the first author selected relevant sections from the student samples — 7 assignments for introduction writing and 6 for literature review writing — rather than providing complete essays. For title formulation tasks, the authors selected from a pool of example titles collected from online course discussions. These titles were drawn from a pre-instruction activity in which students proposed potential research topics and titles before receiving formal guidance on title formulation. As such, they reflected students' initial attempts and common issues in academic title writing, making them more suitable for examining AI's pedagogical potential than the refined titles appearing in completed assignments. A total of 51 initial prompts were developed, addressing three academic writing tasks: title formulation, introduction writing, and literature review writing. In addition to these initial prompts, follow-up prompts were used to probe AI responses further; these varied according to the specific sample and output and were not tracked numerically. Valuable findings from AI responses were documented for analysis.

### **Data Collection and Implementation Process**

Data collection followed an iterative, collaborative process involving all three authors. First, the research team identified common tasks and evaluation focuses based on course assessment rubrics, covering three dimensions: content, structure, and language use (see Appendix A). Second, using the samples, the authors conducted testing on the two GenAI platforms. One author tested

Ernie Bot, another author tested ChatGPT, and the first author tested both. While working from shared tasks and evaluation focuses, each author developed and refined their own prompts during the testing process. Prompts were iteratively adjusted based on AI responses to explore what types of questions yielded useful outputs. Third, AI responses and valuable findings were documented in Word Files and each team member wrote detailed performance reports recording observations about the utility, accuracy, and actionability of the responses.

### **Data Analysis**

The study employed comparative qualitative analysis to examine AI-generated responses. Each team member first independently evaluated AI responses against three course-derived criteria: content, structure, and language use. For general prompts, responses were examined across all three aspects; for aspect-specific prompts, only the relevant criterion was evaluated. Evaluations focused on the practical utility of the responses, the accuracy of suggested modifications, and the actionability of feedback for student learning.

The team then engaged in collaborative analysis, comparing observations and discussing patterns across different prompts and writing tasks. This process also involved comparing responses between ChatGPT and Ernie Bot for identical prompts to identify similarities and differences in tool performance. When divergent interpretations emerged, the team conducted additional tests and discussions until consensus was reached. Through this iterative collaborative process, common patterns were synthesized to draw overall conclusions about GenAI performance in academic Chinese writing contexts.

### **Ethical Considerations**

This study analyzed AI-generated outputs rather than human participant data. The student writing samples served solely as input materials for testing GenAI tools and were not themselves subjects of analysis. All samples were anonymized by the first author prior to use, with names and

identifying information removed. Only selected sentences or paragraphs were used as part of the prompts, rather than complete essays.

### Findings

This section presents the key findings from our investigation into GenAI tools' role in academic Chinese writing. We begin by comparing the two GenAI tools used in this study (4.1), followed by an analysis of how these tools perform in three critical aspects of academic Chinese writing, including content, structure, and language use (4.2–4.4).

#### Comparison of Two Models

Through comparative testing of ChatGPT and Ernie Bot, we observed that while there are differences in the specific content generated by each tool, their overall performance on the academic Chinese writing tasks tested in this study was generally comparable.

First, by posing identical questions to both platforms simultaneously, we found that both GenAI tools produced similar responses. For example, when requesting revisions to a draft, although the specific modifications suggested by each platform differed, the general direction of the revisions and the outcomes were consistent.

#### Original texts:

從全球視角來看，博物館在第二次世界大戰之後迎來了歷史性的轉變（陳中慧，2021）。在此階段，博物館的功能從..... (English translation: From a global perspective, museums ushered in historic shift after the Second World War (Chen, 2021). At this stage, the function of museums changed from.....)

#### (1) Revision by Ernie Bot :

自全球第二次世界大戰後，博物館發生了巨大的變革（陳中慧，2021）。這一階段，博物館從..... (English translation: Since the Second World War globally, museums happened

to have tremendous transformation/underwent tremendous transformation (Chen, 2021).

This stage, museums changed from.....)

(2) Revision by ChatGPT :

從全球視角來看，博物館在第二次世界大戰之後經歷了歷史性的變革（陳中慧，2021）。在這一時期，博物館的功能從..... (English translation: From a global perspective, museums experienced historic transformation after the Second World War (Chen, 2021). During this period, the function of museums changed from.....)

A comparative analysis reveals three key patterns. First, despite different wording, both modifications maintain similar meanings and structural functions. Although the tools made different changes to the first sentence, including varying placement of the temporal adverbial, the sentence functionality remains intact. Both platforms replaced “迎來” (usher) with more objective alternatives - Ernie Bot used “發生” (happen) and ChatGPT used “經歷” (experienced). This substitution eliminates the positive, proactive connotations of “迎來” in favor of neutral, objective terms better suited for academic discourse. Second, both platforms identically modified “轉變” (shift) to “變革” (transformation). While these synonyms both signify transition, “變革” is more formal and grandiose, reflecting GenAI’s tendency to favor elevated terminology in academic contexts. Third, regarding “在此階段” (at this stage), both platforms demonstrated consistent preferences despite slight variations: Ernie Bot used “這一階段” (this stage) while ChatGPT chose “這一時期” (this period). Though “在此” is more formal than “這一”<sup>2</sup>, both being acceptable in academic discourse, both platforms favored “這一”, revealing a systematic preference for less formal alternatives and potentially higher frequency in training data. This pattern underscores broader agreement between platforms regarding both modification location and editorial direction.

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<sup>2</sup> “此” is a more formal morpheme derived from Classical Chinese, while “這” is a more modern colloquial morpheme in contemporary Chinese.

Secondly, both GenAI platforms demonstrate similar capabilities and limitations in handling academic writing tasks. Both platforms can modify students' writing by employing standardized academic Chinese, providing systematic suggestions for academic writing standards (see Appendix B, Example 1), and ensure grammaticality, such as verb-object phrase collocations, shown as in example 3 and 4.

Original text:

.....實現教育現代化是我國當下重要的目標，藉增加受教育人口及受教育年限.....

(English Version: ...achieving the modernization of education is an important goal of our country at present, by increasing the population receiving education and the years of education...)

(3) Revision by Ernie Bot:

.....明確了教育現代化作為當前國家發展的重要目標，旨在通過增加受教育人口和延長受教育年限.....

(English translation: ...clarified that the modernization of education is an important goal for current national development, aimed at increasing the educated population and extending the years of education...)

(4) Revision by ChatGPT:

.....實現教育現代化是我國當前的重要的目標，通過增加受教育人口和延長受教育年限.....

(English translation: ... achieving the modernization of education is an important goal for our country at present, through increasing the population receiving education and extending the years of education...)

In the original sentence, the author used “增加” (increase) as the verb of both “人口” (population) and “年限” (years). Compared with “增加年限” (increase years), which is not wrong, “延长年限”(extend years) is a more accurate and common expression in standard Chinese. This example shows that both GenAI platforms can enhance the grammatical level to a more precise and native standard in a similar, if not identical way.

However, both tools share common limitations: they tend to offer general rather than targeted corrections (see Appendix B, Example 2), cannot separately identify modified sections within revised text, and occasionally fail to generate responses, requiring multiple inputs to achieve optimal results. These specific advantages and disadvantages are described in detail in the analysis in the following subsections. Here, we aim to demonstrate that the convergence of functional characteristics and performance reflects the similarity between the two GenAI platforms, thereby validating the feasibility of using them for research in this study.

Occasionally, the two GenAI tools perform differently in fulfilling specific tasks. One tool may provide valuable assistance while the other may not, though this occurs sporadically without consistent patterns. At times ChatGPT provides satisfactory responses while Ernie Bot does not, and vice versa. Moreover, the quality of responses varies considerably on both platforms; differing results between tests do not indicate fundamental differences in GenAI capabilities, as variation may stem from multiple factors. Therefore, throughout this study, we utilize both GenAI tools without specifying which is being referenced, based on our observation that their overall performance is generally comparable. In conclusion, both tools demonstrate similar capabilities and comparable limitations in assisting with academic Chinese writing.

Subsections 4.2–4.4 examine three aspects of the assignment rubrics: content, structure, and language in academic Chinese writing. While these dimensions are analyzed separately, their interdependence is acknowledged throughout the analysis. Unless otherwise noted, the findings

reported in Sections 4.2–4.4 apply to both ChatGPT and Ernie Bot, consistent with the overall similarity established in Section 4.1.

### **GenAI and The Content of Academic Chinese Writing**

Regarding content, our study reveals that GenAI is proficient in generating ideas and validating arguments in academic Chinese writing. However, it falls short in areas such as citation and logical coherence checking.

We found that GenAI can effectively generate outlines for introductions and literature reviews based on specific titles and research questions. Presented in bullet-point format, the generated outlines adhere to conventional academic structure: introduction, thematic body sections, methodology and discussion. For instance, Appendix B, Example 3 demonstrates clear logical progression from background introduction (rural left-behind children’s health issues) to specific problems (physical and psychological health concerns), then to a discussion of existing policies and potential solutions, and finally to an identification of limitations in previous studies. This functionality benefits students during the ideation stage, particularly beginners unfamiliar with academic writing structure

In addition to brainstorming ideas at the drafting stage, GenAI can also evaluate whether writing meets the standards of academic writing, although its feedback remains limited. For example, when we input a paragraph and request comments on the content and logical structure, it evaluates the content in terms of references and logic. We observed that GenAI can effectively validate arguments when they are supported by sufficient data and research evidence. For weaker arguments, GenAI consistently offers guidance on incorporating appropriate citations from relevant literature to strengthen the credibility of the argument and ensure the literature review remains current (see Appendix B, Example 2). This feedback is helpful for students who are at the beginner level of academic writing to double-check whether their arguments are supported by adequate

research. However, GenAI lacks reliability in citing and validating literature sources, so students should verify the accuracy of their references independently.

Apart from reference checking, the test results suggest that GenAI cannot effectively identify the logical coherence of the content, even when we ask follow-up questions or ask it to double-check. For example, the following is a paragraph from a student assignment:

(5) 故宮通過開設官方網站、研發手機應用程式、運用微博話題標籤等方式傳播故宮文化，說明現時博物館應該結合融媒體技術和傳統文化，以多元創新的手法令傳統文化融入大眾生活。

(English translation: The Palace Museum has been promoting its cultural heritage through various means, such as launching an official website, developing mobile applications, and utilizing Weibo hashtags. This demonstrates that museums today should integrate multimedia technology with traditional culture, employing diverse and innovative approaches to integrate traditional culture into everyday life.)

The logical flaw in the original text is that while the Palace Museum has conducted these promotions, this does not necessarily mean that other museums should follow. The correct logic should be that the Palace Museum has achieved certain results through these promotions, which demonstrates that this approach is effective and can serve as a reference for other museums, rather than suggesting that all other museums should adopt the same approach. However, during our testing, GenAI responded that “There are no obvious logical errors; the overall reasoning holds”, which reveals that it is unable to detect this logic error. Since it cannot provide learners with appropriate responses for academic writing in this context, students are encouraged to cultivate their own logical reasoning and writing skills.

In summary, GenAI serves as a valuable supplementary tool for formulating preliminary drafts and validating arguments in academic Chinese writing. However, it faces challenges in recognizing logical coherence and evaluating source credibility, which means that learners need appropriate guidelines when using these tools.

### GenAI and the structure of academic Chinese writing

To explore how GenAI can assist with the structure of academic Chinese writing, we conducted targeted inquiries using the collected student writing samples. Our findings indicate that GenAI can provide valuable responses regarding organization within paragraphs, such as suggesting transitional sentences and identifying topic sentences for specific paragraphs. For instance, GenAI can recognize relationships between statements and use appropriate conjunctions to enhance the coherence of the text. An example of this is the following sentence<sup>3</sup>:

- (6) 中國政府積極實施各項政策，如包括普及基礎教育、擴大高等教育~~和職業教育普及化規模等~~，旨在提升全社會的受教育人口水平，進而提高民衆的收入能力，增加和消費支出，從而以期逐步改善縮小貧富不均差距和城鄉差距的問題。

(English translation: The Chinese government actively implements various policies, including popularizing basic education, expanding higher education, and increasing the scale of vocational education, with the aim of raising the education level of the entire society. This, in turn, is intended to enhance people's income capacity, increase consumption expenditure, and gradually narrow the wealth gap and the urban-rural divide.)

The original sentences were simply coordinated. By adding conjunctions such as “旨在” (aims to) and “進而” (furthermore), GenAI clarified the relationships between the sentences,

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<sup>3</sup> Underlined text denotes GenAI's additions; strikethrough indicates GenAI's deletions. Unmarked text is original.

making the text more cohesive. Another example involves the integration of cultural phenomena into everyday communication:

- (7) 將這種喪文化融入到表情包中，使其迅速在九零後的青年群體中瘋傳，成為他們日常交流中的一部分。而隨著“喪文化”的盛行，然而，喪文化並不只是一種簡單的流行文化現象。在諸多商家眼中，它還是一座金礦。

(English translation: Integrating this “Sang culture<sup>4</sup>” into memes has allowed it to spread rapidly among the post-90s youth, becoming a part of their daily communication. However, Sang culture is not merely a simple phenomenon of popular culture. In the eyes of businesses, it is also a gold mine.)

After introducing transitional phrases such as “不只是……還是(not merely... is also...)”, the connection between “culture” and “business” becomes more natural, enhancing the flow of ideas.

Despite their proficiency in assisting with micro-level structural elements within academic Chinese writing, both ChatGPT and Ernie Bot showed limited capacity for broader structural coherence. Our inquiries revealed that when dealing with texts spanning multiple paragraphs, GenAI struggled to detect whether subsequent paragraphs maintained logical connections with the preceding ones, offering limited insights into overall coherence. This indicates that while GenAI can assist with certain structural elements, particularly within short text segments, there are still challenges in ensuring comprehensive coherence across larger texts.

### **GenAI and the language use of academic Chinese writing**

In terms of language use, our primary focus was on enhancing students’ proficiency in grammar, punctuation, and vocabulary choices in academic Chinese writing. Through various

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<sup>4</sup> The term “Sang culture” can be translated as “defeatist culture” in English. It refers to a trend among young people that promotes a negative or pessimistic attitude toward various aspects of life.

question types and topics, we aimed to determine whether GenAI could facilitate deeper understanding and improved practice of language use in academic writing among students. Our preliminary findings suggest some initial conclusions regarding the formulation of questions and the effectiveness of the responses.

Initially, we observed that how questions were posed significantly impacted the results. For instance, when we directly asked GenAI for comments on language use, the responses were often overly general, simply repeating the course evaluation criteria, instead of giving further suggestions, (see Appendix B, Example 1). Even when we asked GenAI to evaluate specific written content such as students' literature reviews, across approximately 20 attempts, the majority of GenAI's responses exhibited significant similarity, offering only superficial, detail-lacking suggestions regarding grammar and vocabulary and couldn't facilitate substantive modifications (see Appendix B, Example 4).

In contrast, we found that adjusting our questioning strategy to include specific elements, such as the appropriateness of paragraph structure and the suitability of word choice, led to significantly more accurate and insightful GenAI responses. Another effective method involves inputting existing introductions or literature review paragraphs into GenAI for editing. In these cases, GenAI often transformed the original text into a grammatically correct, academic, and fluent version (see Appendix B, Example 5). While these modifications are highly beneficial, students must still play an active role by independently identifying which sections GenAI altered and critically evaluating its suggestions. Therefore, effective prompt types are those that require students to engage in critical thinking, rather than allowing GenAI to replace their original thought processes.

To further analyze the modifications made by GenAI, we examined its efficiency in revising academic Chinese writing. Our study focused on introductions and literature reviews across various disciplines, such as economics and cultural studies. We found that GenAI effectively enhances

academic writing by improving fluency, correcting typographical errors, using more sophisticated vocabulary, and enhancing the logical coherence of arguments. However, when tasked with editing drafts, GenAI produced revised texts without automatically identifying modifications, requiring students to manually compare original and revised versions to identify what changed. While GenAI can highlight changes when specifically prompted, by default it does not annotate revisions. This lack of automatic transparency presents a notable limitation, as it may reduce students' motivation to improve their writing skills. Additionally, our attempts revealed that providing complete paragraphs rather than just 2-3 sentences can help improve the accuracy of GenAI's modifications. This improvement is likely due to the additional context provided by longer paragraphs, enabling more precise adjustments.

Our research indicates that GenAI can be a valuable tool for enhancing language use in Chinese academic writing. Its ability to produce grammatically correct and logically coherent sentences suggests it can effectively support students. However, this requires understanding how to use GenAI and employing appropriate questioning methods, rather than relying on random results.

### **Discussion**

This section discusses the broader implications of our findings for academic writing pedagogy and research. Drawing on the concept of explicit and implicit knowledge acquisition, we explore how GenAI tools can be used to enhance different dimensions of language learning in academic contexts.

#### **Explicit and Implicit Knowledge in Academic Chinese Writing**

Our findings on GenAI's assistance with content, structure, and language in academic Chinese writing lead us to consider the pedagogical implications of these observations. Specifically, our results highlight the interplay between explicit and implicit knowledge in mastering academic writing conventions. How to write academically in Chinese represents implicit knowledge for native

Chinese speakers, whether they speak Cantonese or Mandarin. The characteristics of academic writing mean that the acquisition of relevant norms is, from a broader perspective, implicit knowledge that is difficult to acquire directly through daily communication and is “intrinsically more difficult than other language registers” (Snow & Uccelli, 2009, p. 114) even for native speakers. Mastering these academic writing norms requires “additional resources of consciousness and explicit learning” (Ellis, 2011, p. 35). Classroom teaching that addresses academic language provides such explicit learning. However, the language knowledge and awareness gained through classroom instruction are often limited due to the restricted timeframe, especially when compared to the complexities and subtleties found in academic registers. In this context, GenAI tools serve as an additional resource that can support both explicit and implicit knowledge acquisition.

This is especially relevant for Hong Kong students who navigate between Cantonese (their spoken language) and standard written Chinese (the medium of academic writing). For these students, the gap between spoken and written language is wider than for Mandarin speakers, as Cantonese differs significantly from standard written Chinese in vocabulary, grammar, and expression. Academic Chinese represents a specialized register that differs significantly from everyday language, therefore requiring conscious acquisition of conventions and rules that cannot be naturally developed.

The discussion on implicit and explicit knowledge primarily focuses on second language acquisition (SLA). According to Ellis (2011), the distinction between SLA and first language acquisition lies in the limited amount of language information acquired implicitly in communicative contexts. Rebuschat (2013) differentiates explicit and implicit knowledge based on their conscious or unconscious status and summarizes various measures in psychological research to assess this status. Isbell and Rogers (2020) define explicit knowledge as knowledge that is consciously acquired through formal instruction, while implicit knowledge is acquired unintentionally through language use without direct teaching. This framework sets the stage for examining how GenAI can be effectively

used to facilitate both explicit and implicit knowledge acquisition in the context of academic Chinese writing.

Upon further examination of the feedback provided by GenAI, it becomes evident that GenAI is more effective at conveying explicit knowledge about academic Chinese writing than implicit knowledge. The explicit knowledge gained from GenAI includes information such as the use of more formal or objective vocabulary and phrases (e.g., replacing “增加年限” with “延長年限”), grammatical corrections such as verb-object collocations, the addition of appropriate conjunctions to clarify relationships between ideas, and the essential components of a well-structured introduction — all of which can be directly acquired from GenAI’s feedback. In contrast, implicit knowledge encompasses more complex and less immediately accessible knowledge that often involves aspects like discourse structure, multi-paragraph coherence, logical reasoning in arguments, and the linguistic reasons why certain forms are considered more “academic” than others. Our findings show that GenAI struggles with these implicit dimensions, highlighting the importance of both types of knowledge in enhancing students’ academic writing skills and their ability to navigate the complexities of academic discourse, while also revealing that GenAI’s current strengths lie primarily in supporting explicit knowledge acquisition.

### **Pedagogical implications and practical recommendations**

As noted above, GenAI demonstrates strengths in explicit knowledge areas: generating well-structured outlines for introductions and literature reviews, enhancing paragraph-level organization through appropriate transitional elements, and producing grammatically correct, academically fluent text with sophisticated vocabulary. It also excels in providing personalized modifications that address students’ immediate challenges, particularly benefiting beginner-level writers in ideation, argument validation and language refinement. GenAI enables students to quickly obtain intermediate-level responses that provide valuable support, though they do not match the depth of instructor evaluation.

Despite these capabilities, GenAI presents significant limitations that affect its effectiveness. To maximize the effectiveness of GenAI tools, students must possess strong reasoning skills, critical thinking abilities, and solid knowledge of academic writing. Our study demonstrates that GenAI presents several challenges, including its inability to detect logical coherence across longer texts and unreliability in citation validation. Students must develop the ability to independently verify the accuracy and reliability of AI-generated information.

Additionally, since GenAI yields better results when students engage in preliminary cognitive processing, acquiring foundational knowledge beforehand remains essential for effective use. Less advanced students who struggle to formulate specific inquiries may find GenAI's effectiveness diminished, increasing the risk of accumulating inaccurate information due to difficulties in identifying errors in AI feedback.

Given these limitations, students should adopt strategic approaches to optimize their interactions with GenAI: providing complete contexts rather than fragmented requests; formulating specific, targeted questions instead of requesting general comments; using GenAI for preliminary brainstorming and outline generation while independently verifying sources and citations; actively comparing original and revised texts to understand modifications; and developing systematic verification processes to cross-check factual claims and assess logical coherence independently.

Beyond these student-focused strategies, educators can use GenAI to strengthen the teaching of implicit knowledge in academic Chinese classrooms. Ellis (2017) points out that "consciousness" in SLA can manifest through discovering negative evidence, focusing on language forms, making analogical reasoning, and engaging in guided practice. Similarly, in academic Chinese teaching, we can apply GenAI as an assistant to enhance the following aspects of instruction:

1. **Negative Evidence:** Use GenAI to generate academic writing excerpts, guiding students to identify good and bad practices. This approach helps students consciously recognize negative evidence in academic Chinese writing.
2. **Focus on Language Forms:** GenAI often provides valuable insights into language forms, particularly in vocabulary and syntactic choices, assisting students in acquiring relatively explicit knowledge about academic Chinese writing.
3. **Analogical Reasoning:** Based on the information provided by GenAI, students can be guided to expand their practice according to specific language knowledge points, facilitating the transfer of implicit writing knowledge. Teachers can also design similar materials (potentially with GenAI assistance) for students to reinforce their practice.
4. **Guided Practice:** Teachers can play a critical role in the learning process by effectively supporting and directing students throughout their academic Chinese learning journey. By providing structured guidance and feedback, they can help students identify the strengths and weaknesses of GenAI tools, deepen their understanding of academic genres, and apply their knowledge more effectively in academic writing.

From an educational perspective, academic Chinese writing courses should prioritize developing students' critical thinking and writing skills while recognizing GenAI's capabilities and limitations. Course design should incorporate training on prompt formulation, source verification, and critical evaluation of AI-generated content. Educators should focus on improving students' ability to construct logical relationships across longer texts and design assignments that encourage students' reasoning skills and critical awareness when using GenAI, such as explaining why they accepted or rejected AI suggestions. These strategies position GenAI as a good complement to classroom instruction, empowering students to effectively integrate it into their writing process while maintaining control over the nuanced, multifaceted dimensions of academic writing.

#### **Insight for Academic Chinese Writing Research**

Beyond GenAI's assistive role in strengthening the teaching of academic Chinese writing, its strengths and weaknesses also present considerable opportunities for academic Chinese writing research. GenAI's performance serves as a valuable tool for capturing the statistically patterned knowledge embedded in large language models for academic writing. Its proficiency in micro-level elements, such as grammaticality, vocabulary selection, and the coherence of neighboring sentences, suggests that these features are governed by more readily identifiable linguistic rules (which could correspond to the explicit knowledge in language learning). Therefore, computational approaches leveraging GenAI could potentially validate the known characteristics of academic writing and further illuminate the discovery of linguistic patterns in academic Chinese discourse.

However, despite GenAI's ability to capture certain linguistic patterns, our findings confirmed that it possesses significant limitations, particularly regarding structural and nuanced language use. Specifically, GenAI's limitations become pronounced when dealing with macro-level organization, such as multi-paragraph coherence and subtle logical flow across longer texts. This deficiency highlights the need for further linguistic research into academic Chinese. By systematically identifying and analyzing these often implicit conventions, our understanding of academic Chinese discourse will be deepened, and the learning and teaching of academic Chinese writing will also benefit significantly.

### **Conclusion**

In this study, we explored the opportunities and challenges that GenAI presents for teaching and learning academic Chinese writing for native speakers. By integrating GenAI into the instructional materials for academic Chinese, we assessed the effectiveness of these tools in enhancing students' writing skills, with a particular focus on content, structure, and language use.

Based on our findings, it is evident that GenAI serves as a valuable tool in the realm of academic Chinese writing, facilitating both teaching and learning. Specifically, GenAI demonstrates

proficiency in generating well-structured outlines, enhancing paragraph-level organization through transitional elements, and producing grammatically correct, academically fluent text. However, challenges remain, particularly in detecting logical coherence across longer texts, validating citations, and requiring students to possess foundational knowledge of academic writing conventions for effective use.

Given these mixed capabilities, educators play a crucial role in this process, as they must strategically consider how to effectively incorporate GenAI into their teaching methodologies and serve as navigators in the language education journey. Our findings suggest that GenAI should be regarded as an assistive tool that complements classroom instruction rather than a comprehensive solution, requiring students to develop critical thinking skills and systematic verification processes to maximize its effectiveness. Moving forward, further research is needed to refine the application of GenAI in academic Chinese writing and to develop strategies that enhance its effectiveness, particularly in addressing the complex demands of language education. This ongoing exploration will be crucial for fully leveraging the potential of GenAI within academic contexts.

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## Appendix A

### Prompt Categories and Examples

#### Title Writing Prompts

**Broad feedback requests** 我在寫作一篇關於中國研究的學術論文。我計劃將文章標題擬為：[標題]。請給我提供一些意見。

*(I am writing an academic paper on China studies. I plan to title my article: [title]. Please provide some feedback.)*

#### Keyword identification and refinement

[標題]。這個論文標題裡有哪些關鍵詞？

*([Title]. What are the keywords in this paper title?)*

[關鍵詞] 這個關鍵詞太寬泛了，我想縮小，有什麼建議？

*([Keyword] This keyword is too broad, I want to narrow it down, any suggestions?)*

#### Clarity and grammar checks

[標題]，作為學術論文標題，是否清晰、簡明、準確、學術？

*([Title], as an academic paper title, is it clear, concise, accurate, and scholarly?)*

[標題]，作為學術論文標題，有沒有語法問題？

*([Title], as an academic paper title, are there any grammatical issues?)*

#### Follow-up questions

為什麼要改為冒號，不用問號。請解釋。

*(Why change to a colon instead of a question mark? Please explain.)*

作為本科生的寫作，這個標題是否太寬泛了？

*(For undergraduate writing, is this title too broad?)*

## Introduction Writing Prompts

### Generation requests

如果我想寫一篇學術文章，標題是：[標題]。我的前言該如何組織？請涵蓋研究背景、研究動機、關鍵概念界定、研究目的和意義、研究方法、文章結構。

*(If I want to write an academic article with the title: [title]. How should I organize my introduction? Please cover research background, research motivation, key concept definitions, research purpose and significance, research methods, and article structure.)*

### Analytical requests

請幫我分析這段學術論文前言的寫作思路：[輸入前言]

*(Please help me analyze the writing approach of this academic paper introduction: [input introduction])*

### Revision requests

我在進行本科生學術寫作，題目為[標題]，篇幅為兩千五百字。這是我的前言，請你修改。

*(I am writing an undergraduate academic paper, the title is [title], with a length of 2,500 words. This is my introduction, please revise it.)*

我寫的前言可以怎麼改進？請你 proofread:

*(How can I improve my introduction? Please proofread:)*

### Language improvement

如何改進，使得這篇前言的語句更精煉/準確/正式？

*(How to improve this introduction to make the language more concise/accurate/formal?)*

[具體詞彙選擇問題，如：用提高支出更好還是增加支出更好]

*([Specific word choice question, e.g., Is "increase expenditure" or "raise expenditure" better?])*

### **Structure and coherence**

這篇前言的前後語句是否連貫？

*(Are the sentences in this introduction coherent?)*

第一段和第二段的轉折之間是否有些突然？

*(Is the transition between the first and second paragraphs too abrupt?)*

### **Literature Review Writing Prompts**

#### **Generation requests**

我在進行本科生的學術寫作，希望探討[主題]。請你幫我寫一篇文獻析評。

*(I am doing undergraduate academic writing and want to explore [topic]. Please help me write a literature review.)*

我在進行本科生的學術寫作，請你幫我尋找關於[主題]方面的文獻。

*(I am doing undergraduate academic writing, please help me find literature on [topic].)*

#### **Instructional requests**

請教我如何寫文獻析評。

*(Please teach me how to write a literature review.)*

兩千五百字的文獻析評需要引用多少篇文獻？

*(How many sources should be cited in a 2,500-word literature review?)*

#### **Revision requests**

我在進行本科生學術寫作，題目為[標題]，以下是我的文獻析評，請你修改。

*(I am doing undergraduate academic writing, the title is [title], below is my literature review, please revise it.)*

以下是我的文獻析評。給我的文獻析評提出一些建議。

*(Below is my literature review. Please provide some suggestions for my literature review.)*

## Appendix B

### Examples of Prompts and GenAI Responses

#### Example 1

##### Prompt

請告訴我在學術寫作中語言方面需要注意什麼

##### GenAI's Response

在學術寫作中，語言方面的注意事項至關重要，它們直接關係到論文的質量、準確性和可讀性，以下是一些關鍵的語言方面注意事項：

##### 1. 準確性

用詞貼切：選擇具有明確含義的詞彙，避免使用模糊或含糊不清的表達方式

專業術語：使用本領域內的專業術語，並確保其準確無誤，以體現論文的專業性

計量單位與公式：確保計量單位、公式等語言符號的準確、客觀、真實

避免主觀臆斷：在描述觀點或結論時，應基於客觀事實和證據，避免主觀斷。

##### 2. 簡潔性

言簡意賅：儘可能用最少的語言符號，表達出最豐富的內容。避免冗長、複雜的句子和不必要的修飾詞。

##### Translation

**Prompt.** Please tell me what I need to pay attention to in terms of language in academic writing.

**GenAI's Response.** In academic writing, language considerations are crucial, and they are directly related to the quality, accuracy, and readability of the paper. The following are some of the key linguistic considerations:

##### 1. Accuracy

Use relevant words: Choose words with clear meanings and avoid vague or ambiguous expressions.

**Terminology:** Use terminology that is specialized in your field and make sure it is accurate to reflect the professionalism of the paper.

**Units of Measurement and Formulas:** Ensure that linguistic symbols such as units of measurement and formulas are accurate, objective, and truthful.

**Avoid subjective assertions:** When describing ideas or conclusions, they should be based on objective facts and evidence and avoid subjective assumptions.

## 2. Simplicity

**Simplicity:** Use the fewest possible language symbols to express the richest content. Avoid long, complex sentences and unnecessary modifiers.

### Example 2

#### Prompt

以下是我已經寫好的文獻析評的第一段，請你幫我評價以及提供改善方向：

此文亦發現另一個問題是在於中國的政策本身。任驛佳、吳布衣與袁芳（2018）的研究開首指出中國在 2019 年進口額最大的產品晶元，向外購入芯片一年就要花費 2400 億美元外匯儲備。全球手機有 77%是中國製造的，但是當中用到的芯片不足 3% 是國產的。可見中國的芯片業仍然對外依賴。

#### GenAI's Response

您的文獻分析的第一段已經涵蓋了中文文獻的要點，並提出了中國芯片業依賴進口的問題。以下是對該段的評價和改善方向：

評價：

- 您的文獻分析提出了中國芯片業依賴進口的問題，這是一個重要的觀點，並且有數據支援。

- 您使用了適當的引用和引用格式，準確地引述了任驛佳、吳布衣與袁芳（2018）的研究結果。

改善方向：

- 在學術化方面，可以進一步提高語言的正式性和準確性。例如，使用專業術語和準確的翻譯，以及更加正式的表達方式。

- 另外，可以考慮提供更多相關的背景資訊，例如解釋為什麼晶元業對於一個國家的重要性，以及為什麼晶元的進口依賴對中國的經濟和技術發展產生了影響。

- 最後，建議在文獻分析的結尾部分提供一些觀點或結論，以進一步加強整體的邏輯和連貫性。

### Translation

**Prompt.** The following is the first paragraph of a literature analysis review I have already written, and I would appreciate your help in evaluating it as well as providing directions for improvement: This article also finds that another problem lies in China's policies themselves. A study by Ren Yijia, Wu Buyi, and Yuan Fang (2018) begins by pointing out that China's largest import in 2019 will be chips, which cost \$240 billion a year in foreign exchange reserves to purchase. 77% of the world's cell phones are made in China, but less than 3% of the chips used in them are domestically produced. This shows that China's chip industry is still dependent on foreign countries.

**GenAI's Response.** The first paragraph of your literature analysis has covered the main points of the Chinese literature and raised the issue of China's chip industry's dependence on imports. Below is an evaluation of the paragraph and directions for improvement:

#### Evaluation:

- Your literature analysis has raised the issue of China's chip industry's dependence on imports, which is an important point and is supported by data.

- You used proper citation and quotation format and accurately cited (not correctly cited) the findings of Ren Yijia, Wu Buyi & Yuan Fang (2018).

#### Directions for Improvement:

- The formality and accuracy of the language could be further improved in the area of academicization. For example, the use of specialized terminology and accurate translations, as well as more formal expressions.

- Also, more relevant background information could be considered, such as explaining why the chip industry is important to a country, and why the import dependence of chips has had an impact on China's economic and technological development.

- Finally, it is recommended to provide some points or conclusions at the end of the literature analysis to further enhance the overall logic and coherence.

### Example 3

#### Prompt

我正在寫一篇學術論文，標題是“農村留守兒童的困境：以身體及心理健康問題為例”，研究方向是“從身體健康及心理健康角度探討留守兒童面對的問題，以及有何改善方法。”請幫我撰寫一篇文獻析評的大綱。

#### GenAI's Response

以下是一份關於你提供的學術論文題目的文獻綜述大綱：

#### I. 引言

- A. 研究背景和目的
- B. 論文結構概述

#### II. 農村留守兒童的身體健康問題

- A. 描述農村留守兒童的特點和困境
- B. 分析農村留守兒童面臨的身體健康問題
- C. 探討這些問題對留守兒童的影響和後果

#### III. 心理健康問題

- A. 分析農村留守兒童的心理健康問題
- B. 探討留守兒童因長期分離和缺乏家庭支持所引起的心理壓力和困擾

- C. 探討這些問題對留守兒童的發展和生活品質的影響
- IV. 留守兒童問題的改善方法
  - A. 國家政策和社會倡議對留守兒童問題的關注和改善
  - B. 提出改善農村留守兒童身體和心理健康的具體方法和措施
  - C. 探討這些方法的可行性和效果
- V. 研究方法和數據分析
  - A. 研究設計和樣本選擇
  - B. 資料收集和分析方法
  - C. 資料結果和討論
- VI. 討論和結論
  - A. 對研究問題的回答和發現
  - B. 對現有研究的貢獻和局限性
  - C. 對未來研究的建議和展望
- VII. 結束語

這個大綱可以說明你在撰寫文獻綜述時有一個清晰的結構和指導。根據你的具體研究內容和材料，你可能需要進一步細化每個部分，並添加適當的子標題和段落。請確保對相關研究進行全面的回顧，並提供批判性的分析和綜合。另外，請記得在引用文獻時遵循相關的引用規範。

### Translation

**Prompt.** I am writing an academic paper named “The Dilemma of Left-behind Children in Rural Areas: A Case Study of Physical and Mental Health Problems”, and the direction of the research is “exploring the problems faced by left-behind children from the perspectives of physical health and mental health, and what can be done to improve them.” Please help me write an outline for a literature analysis review.

**GenAI's Response.** Below is an outline of a literature review on the academic paper topic you have provided:

## I. Introduction

A. Background and Purpose of the Study

B. Overview of the Thesis Structure

## II. Physical Health Problems of Rural Left-behind Children

A. Describe the Characteristics and Difficulties of Rural Left-behind Children

B. Analyze the physical health problems faced by left-behind children in rural areas

C. Explore the impact and consequences of these problems on left-behind children.

## III. Mental Health Problems

A. analyzing the mental health problems of left-behind children in rural areas

B. To explore the psychological stress and disturbance of left-behind children caused by prolonged separation and lack of family support.

C. To explore the impact of these problems on the development and quality of life of left-behind children.

## IV. Ways to improve the problems of left-behind children

A. Attention to and improvement of the problem of left-behind children in national policies and social initiatives

B. Proposing specific methods and measures to improve the physical and mental health of left-behind children in rural areas

C. Exploring the feasibility and effectiveness of these methods

## V. Research Methodology and Data Analysis

A. Research design and sample selection

B. Data collection and analysis methods

C. Data results and discussion

## VI. Discussion and Conclusion

- A. Answers to the research questions and findings
- B. Contributions and Limitations to Existing Research
- C. Suggestions and perspectives for future research

#### VII. Conclusion

This outline will help you have a clear structure and guidance when writing your literature review. Depending on your specific research and material, you may need to further refine each section and add appropriate subheadings and paragraphs. Be sure to provide a thorough review of relevant research and provide a critical analysis and synthesis. Also, please remember to follow the relevant citation conventions when citing literature.

#### Example 4

##### Prompt

.....以上是我《xxx》論文的前言，請對我的這段前言進行評價

##### GenAI's Response

.....語言流暢性：這篇文章語言流暢，易於閱讀，沒有語法錯誤或表達不清。

##### Translation:

**Prompt.** ..... The above is the introduction to my “xxx” essay, please rate me on this introduction

**GenAI's Response.** .....The language of the essay is fluent and easy to read. There are no grammatical errors or unclear expressions.

#### Example 5

##### Prompt

我在進行本科生學術寫作，題目為《中國民眾受教育水平提升對城鄉居民消費水平的影響分析》，篇幅為兩千五百字。這是我的前言，請你修改。

##### Original Text (First Paragraph)

教育，是體現國家綜合實力的核心之一，有利於提高國家的話語權、影響力以至國際競爭力。再者，教育可提高人們的知識水平，繼而提升其個人競爭力，從而改善生活環境，更

甚者擺脫貧困。改革開放至今，中共中央政府推出了多項政策以完善我國的教育體系，增加受教育人口。其中，中共中央印發的《中國教育現代化 2035》，亦提及實現教育現代化是我國當下重要的目標，藉增加受教育人口及受教育年限，以推動中國成為國際的人力資源及人才強國（新華社，2019）。

### Revised Text by GenAI

教育，是國家綜合實力的核心體現之一，對於增強國家話語權、擴大國際影響力乃至提升整體競爭力具有深遠意義。此外，教育在提升個體知識水平，塑造個人競爭力，以及改善生活環境等方面也發揮著不可替代的作用，甚至能夠成為擺脫貧困的重要途徑。自改革開放以來，中國政府推始終高度重視教育事業，通過多項政策不斷完善教育體系，努力提高受教育人口比例。特別是《中國教育現代化 2035》的印發，明確了教育現代化作為當前國家發展的重要目標，旨在通過增加受教育人口和延長受教育年限，推動中國成為全球人力資源及人才強國（新華社，2019）。

### Translation

**Prompt.** I am writing an undergraduate academic paper titled “Analysis of the Impact of Rising Educational Attainment Among the Chinese Population on Urban and Rural Residents’ Consumption Levels”, with a length of 2,500 words. This is my introduction. Please revise it.

**Original Text (First Paragraph).** Education is one of the core indicators of a nation’s comprehensive strength, contributing to enhancing the country’s voice, influence, and international competitiveness. Furthermore, education can improve people’s knowledge levels, thereby enhancing their personal competitiveness, improving living conditions, and even enabling them to escape poverty. Since the reform and opening-up, the Central Government of the Communist Party of China has introduced multiple policies to improve our country’s education system and increase the educated population. Among these, the “China Education Modernization 2035” document issued by the Central Committee states that achieving educational modernization is an important current

goal for our country, aiming to increase the educated population and years of schooling to position China as an international powerhouse in human resources and talent (Xinhua News Agency, 2019).

**Revised Text by GenAI.** Education is one of the core manifestations of a nation’s comprehensive strength, holding profound significance for enhancing national voice, expanding international influence, and boosting overall competitiveness. Furthermore, education plays an irreplaceable role in elevating individual knowledge levels, shaping personal competitiveness, and improving living conditions, and can even serve as an important pathway out of poverty. Since the reform and opening-up, the Chinese government has consistently prioritized education, continuously improving the education system through multiple policies and striving to increase the proportion of the educated population. In particular, the issuance of “China Education Modernization 2035” established educational modernization as an important goal for current national development, aiming to increase the educated population and extend years of schooling to position China as a global powerhouse in human resources and talent (Xinhua News Agency, 2019)

Table B1 presents a summary of the revisions made by GenAI in Example 5.

**Table B1**

*Summary of Revisions in Example 5*

Original	Revised	Change
是體現國家綜合實力的核心之一	是國家綜合實力的核心體現之一	Restructured for smoother expression
有利於提高國家的話語權、影響力以至國際競爭力	對於增強國家話語權、擴大國際影響力乃至提升整體競爭力具有深遠意義	More formal academic phrasing; expanded parallel structure
再者	此外	More formal connector
教育可提高人們的知識水平，繼而提升其個人競爭力	教育在提升個體知識水平，塑造個人競爭力，以及改善生活環境等方面也發	More sophisticated structure; 人們 → 個體 (more academic); added “發揮著不可

爭力，從而改善生活環境，更甚者擺脫貧困	揮著不可替代的作用，甚至能夠成為擺脫貧困的重要途徑	替代的作用” (plays an irreplaceable role)
改革開放至今	自改革開放以來	More standard academic phrasing
中共中央政府推出了多項政策以完善我國的教育體系	中國政府始終高度重視教育事業，通過多項政策不斷完善教育體系	中共中央政府 → 中國政府 (simplified); added 始終高度重視 (consistently prioritized)
中共中央印發的《中國教育現代化 2035》，亦提及.....	特別是《中國教育現代化 2035》的印發，明確了.....	Coherent: 特別是 (in particular); More concise; 亦提及 → 明確了 (stronger verb)
藉增加受教育人口及受教育年限	旨在通過增加受教育人口和延長受教育年限	藉 → 旨在通過 (more formal); added 延長 for accurate collocation
國際的人力資源及人才強國	全球人力資源及人才強國	國際的 → 全球 (more precise)

**Note.** Overall, GenAI improved the text by using more formal academic vocabulary, enhancing sentence structure with parallel constructions, and selecting more precise collocations.