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Developing Prompt Engineering as a 21st-Century Skill: The Impact of Structured ChatGPT Instruction in EFL Education

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Abstract

Artificial intelligence (AI)-powered large language models, such as ChatGPT, are increasingly utilized in education, particularly for language learning. However, the effectiveness of AI-assisted learning is highly dependent on the quality of user-generated prompts. This study examines how structured instruction in prompt engineering affects English as a Foreign Language (EFL) students' ability to craft effective ChatGPT prompts, their engagement with AI, and their confidence in AI-assisted learning, culminating in the development of skills that will increasingly be in demand in the workplace. Using a three-phase intervention, students first generated self-created prompts, then used teacher-provided prompts based on the Nazari and Saadi framework, and finally received explicit instruction in structured prompt writing. After receiving instruction in prompt engineering, there were significant improvements in student prompt quality. Additionally, students' confidence in prompt generation significantly increased after instruction. However, teacher-provided prompts alone did not significantly enhance student perceptions of ChatGPT's usefulness for grammar or vocabulary improvement. These findings underscore the importance of explicit instruction in AI

prompt engineering, suggesting that providing structured frameworks enhances student engagement, prompt effectiveness, and confidence in AI-assisted learning. Implications for AI-based language instruction and future research directions are discussed.

Keywords: AI literacy, prompt engineering, English as a Foreign Language (EFL), cognitive apprenticeship

1. Introduction

Across the higher education sector around the world, we are seeing a significant shift in the ways lecturers teach and students learn. Technological innovation in education is no longer a novelty; teaching and learning has adjusted and incorporated digitalisation to varying degrees of effectiveness (Ghilay, 2019). Using learning management systems (LMS) such as Moodle and Blackboard for interaction with students has made course management and development more streamlined (e.g., Kraleva et al., 2019; Vivitsou, 2019). The sudden requirement to move all levels of teaching online from the outset of the Covid-19 pandemic accelerated the uptake of digital learning. For those teachers who had already been actively engaged in using LMSs, this next phase of digitalised learning was less disruptive, and teachers were able to leverage the advantages of multimedia platforms (Ghilay, 2019).

With the release of OpenAI's ChatGPT onto the market in November 2022, technological innovation took another exponential leap with 100 million users trying it out within the first few months (Hu, 2023). While the AI in Education and Technology (AIET) community has been working on integrating AI into educational technology for the past 25 years (Raghuram & Jain, 2024), fully embracing AI has been widely resisted among educators (Kalmus & Nikiforova, 2024). Concerns over academic integrity, transparency, and honesty are uppermost among academics, alongside student misuse and cheating (Rasul et al., 2023). For language competence teachers, students' complete abdication of course exercises and activities – particularly writing tasks – to Gen AI is a major concern. Understandably, teachers feel that providing feedback on AI-generated student work is pointless and wastes their time and energy (Preshern & Born-Lechleitner, 2024).

Despite the many and justifiable concerns around Gen AI in higher education, there are tangible benefits to be reaped from a mindful and ethical implementation of the tool (Kalmus & Nikiforova, 2024; Keerthi & Raghuram, 2024). Not least is the potential for personalised learning, and in particular for autonomous *language* learning (Szabó & Szoke, 2024). With appropriate and informed training, educators and language teachers can teach their students how to leverage the power of Gen AI to improve their learning and development (Crompton et al., 2024). This paper reports on a small-scale study in which EFL students learned to write effective ChatGPT prompts. The goal is to show fellow language teachers that we can guide students to use ChatGPT as a learning tool rather than as a way to circumvent the challenges of language acquisition. This has the additional benefit of developing digital literacy skills that students will likely need in their future work lives.

The first section of the paper reviews literature which provides an insight into the role of Gen AI in education and the EFL classroom in particular. It continues with a discussion of the relevance of prompt engineering and then moves into an exploration of three frameworks that can help in engineering prompts – the Nazari model was chosen as the analytical framework

for the study presented here. Following this, we present the research study: design, methodology, and results. A discussion ensues, followed by a concluding section that reiterates the importance of explicitly teaching language students at university how to effectively prompt Gen AI in order to maximise the learning effect.

2. Literature Review

2.1. ChatGPT's Role in Education

Artificial intelligence (AI) involves machines simulating human cognitive processes (Fogel, 2022). One type of AI, known as a large language model (LLM), can generate text that closely resembles human writing. A specific application of LLMs is the chatbot, with ChatGPT being one of the most well-known examples. Launched in November 2022 by OpenAI, ChatGPT has surpassed previous chatbot models in versatility and application potential (Ali et al., 2024). Since its release, ChatGPT has remained a prominent AI technology, particularly in education (Bettayeb et al, 2024; Walter, 2024).

Numerous studies have documented the benefits of using ChatGPT in the classroom, highlighting its ability to provide personalised learning, support autonomous learning, and deliver time-efficient feedback. ChatGPT can enhance teacher-directed instruction by offering personalised information and answering student questions to deepen their understanding of classroom content (Alenezi et al., 2023; Baidoo-Ann & Ansah, 2023).

Beyond teacher instruction, students can use ChatGPT to receive individualised learning support, supplementing traditional methods such as lectures and textbooks (Rasul et al., 2023). As a result, ChatGPT can serve as a virtual tutor or teaching assistant (Hopkins et al., 2023). For example, a study by Agustini (2023) found that ChatGPT effectively supported high school students' individual learning needs and accommodated diverse learning styles, allowing them to take greater ownership of their education.

In addition to personalised instruction, ChatGPT promotes autonomous learning by enabling students to set learning goals, identify resources, create structured learning plans, and reflect on their progress (X. Lin, 2024; Nazari & Saadi, 2024). By facilitating independent learning, ChatGPT empowers students to take control of their educational development. Self-reliance and independent thinking are among the skills which employers are looking for when hiring new talent; developing digital competencies while at university has to become an integral part of higher education today.

Another key advantage of ChatGPT is the immediacy of its feedback. AI-powered tools like ChatGPT can generate feedback instantaneously, at any time of day, which students find highly beneficial for their learning experience (Kasneci et al., 2023; Preschern & Born-Lechleitner, 2024). The ability to receive timely feedback enhances the learning process by allowing students to quickly identify areas for improvement and refine their understanding in real time.

2.2. Use of ChatGPT in the English as a Foreign Language Classroom

Over and above the more generalised educational benefits, ChatGPT can also support both oral and written language learning in the English as a Foreign Language (EFL) classroom. The use of ChatGPT has been shown to improve overall oral communication skills, with students who use AI more frequently to practice language interactions performing better on language assessments (Cao

& Zhong, 2023; Shaikh et al., 2023). However, while there are indications that ChatGPT can support student language learning (Preschern & Lechleitner, 2024), research around the provision of feedback to language learners remains inconclusive (Xerri & Block, 2025).

An experimental study by Wang (2025), showed that students who had utilized ChatGPT-4 to improve their oral communication skills performed better than the control group that had received teacher-only feedback; the experimental group made fewer English language errors from pre-test to post-test than those not receiving AI feedback. Conversely, in a writing-focused context, Mohammadi et al. (2023) found that teacher-only or blended teacher-AI feedback resulted in better performing students than in the case of AI-only generated feedback on writing. That being said, it certainly seems that ChatGPT is useful as an aid for improving written language. It can assist students in all phases of the writing process, from generating writing prompts to providing personalised written feedback (Herft, 2023; Steiss et al., 2024). As busy teachers are increasingly learning for themselves (e.g., Khlaif et al., 2024), ChatGPT streamlines many written language tasks, including drafting and summarising texts (Bin Arif et al., 2023).

ChatGPT is also beneficial for vocabulary acquisition. Students report effectively using AI technology independently to identify synonyms, rephrase texts using more sophisticated vocabulary, and generate fill-in-the-blank activities for vocabulary practice (Preschern & Lechleitner, 2024). Students can also use ChatGPT to acquire new words (Shaikh et al., 2023), and then improve on using those words cohesively and coherently. Hwang et al. (2023) note that AI was able to support the iterative process of revising and editing, while Tseng & Lin (2024) point to the immediacy of feedback, instant idea generation, and structural improvements AI affords.

Returning to concerns around the efficacy of AI-tools for language learning, there are mixed reports on whether ChatGPT can effectively aid in grammar improvement. It is documented that ChatGPT can correct grammar mistakes in written text (Younis et al., 2023), but students report lower levels of success in using ChatGPT to improve grammar knowledge compared to learning vocabulary (Preschern & Born-Lechleitner, 2024; Schmidt-Fajlik, 2023). Other researchers suggest that ChatGPT has the potential to engage learners in English grammar improvement (Phieanchang, 2024). For example, Kucuk (2024) conducted an experimental study in which the experimental group received ChatGPT-centred grammar education, while the control group received book-centred instruction. Post-test results revealed that the experimental group outperformed the control group, and a focus group interview indicated that ChatGPT users were satisfied with the integration of the technology into their grammar lessons (Kucuk, 2024).

Behforouz and Al Ghaithi (2024) found similar positive results. In their study, the control group received traditional face-to-face instruction. Experimental Group 1 received in-class instruction supplemented by ChatGPT, which provided feedback on grammatical structures. Experimental Group 2 engaged in fully online instruction, with ChatGPT as the primary feedback facilitator for grammatical tasks. Statistical analysis indicated that all groups improved grammatical proficiency from pre-test to post-test. However, the progress observed in Experimental Group 1 was statistically more significant, suggesting that supplementing grammar instruction with ChatGPT is most effective. This concurs with what Mohammadi et al. (2023) found with a blended approach to language learning being most effective for writing classes, and that students expressed a strong preference for teacher-AI-blended learning.

2.3. The Impact of Effective Prompts on AI-Generated Outcomes

To effectively engage with and benefit from LLM support, users must input prompts—natural language instructions that provide the AI with specific rules, processes, and desired qualities for the generated output (Liu et al., 2023; White et al., 2023). These prompts can take various forms, including simple questions, statements, or detailed descriptions designed to elicit a specific AI response (Amatriain, 2024). In essence, prompts function as a form of programming that governs both the interaction with AI and the quality of its output (White et al., 2023).

The quality of an LLM's output, such as that generated by ChatGPT, is highly dependent on the effectiveness of the provided prompt. Well-structured prompts tend to produce high-quality responses, whereas poorly constructed prompts can result in suboptimal outcomes (Dwivedi et al., 2023; Ekin, 2023; Heston & Khun, 2023; Zhou et al., 2023).

The process of writing effective prompts is more complex than it may initially appear. Simply knowing a language does not guarantee the ability to communicate effectively with AI, making prompt writing a skill that requires deliberate practice and learning (Oppenlaender et al., 2024). Users interact with LLMs in diverse ways. Non-technical users often rely on a trial-and-error approach to refine their prompts, which can be both inefficient and time-consuming (Dang et al., 2022; Federiakin et al., 2024). In contrast, Sawalha et al. (2024) documented strategies employed by computer science students when solving five distinct problems. Some students simply copied and pasted questions into the LLM, while others iteratively refined their prompts, ultimately achieving better outcomes. This evidence underscores the importance of developing proficiency in prompt engineering through structured instruction and practice (Chan & Colloton, 2024; Oppenlaender et al., 2024).

2.4. Prompt Engineering: An Emerging 21st-Century Skill

The process of designing, refining, and optimising input prompts for large language models (LLMs), such as ChatGPT, is known as **prompt engineering** (Eager & Brunton, 2023; Ekin, 2023). As a relatively new research area, prompt engineering focuses on developing structured inputs that effectively engage LLMs across diverse applications (White et al., 2023). This technique is crucial for obtaining optimal results from ChatGPT, as it enables users to structure their input in a way that guides the model toward the desired outcome (Patel & Parmar, 2024; Wang et al., 2023).

2.4.1. Frameworks for Prompt Engineering

Prompt engineering can be approached through various structured frameworks, which range from complex models to more simplified structures. For example, Ramlochan (2023) proposes a five-component prompt framework, which includes:

- Task (the core action of goal),
- Instructions (specific guidelines for execution),
- Content (the subject matter),
- Parameters (adjustments such as temperature or token limits), and
- Input (data provided to the model).

Additionally, Ramlochan identifies 17 supplementary elements that refine prompts, including temperature, token limits, role, topic, query, command, structure, goals, format, examples, audience, probability, script, document, and dialect.

In contrast, Z. Lin (2024) suggests a simplified framework for applied linguistics that comprises five components:

1. Persona – The role the LLM is instructed to adopt.
2. Audience – The target audience of the output.
3. Context – Background details that help the LLM understand the task.
4. Specific Instructions – Clear directives on the desired output.
5. Output Specifications – The expected style, tone, and format.

In applied linguistics, this framework can specify the complexity level of the material using the Common European Framework of Reference for Languages (CEFR) (e.g., B1, B2, C1) and indicate dialect preferences, such as American, British, or Australian English.

Another structured approach, designed specifically for higher education, is the Nazari and Saadi Prompt Framework (Nazari & Saadi, 2024). Similar to Ramlochan's model, this framework categorises prompts into components and elements but simplifies the structure to enhance accessibility for students. Nazari and Saadi´s prompt structure includes three main components:

1. Task – The specific goal or action.
2. Context – Background information related to the prompt.
3. Instructions – The required approach or format.

Additionally, it incorporates five elements to refine responses:

- Role – The assumed identity of the model (e.g., an English teacher).
- Audience – The intended recipients of the output.
- Tone – The appropriate style and complexity level.
- Examples – Illustrative references for clarity.
- Limits – Constraints on the response (e.g., avoiding sentence structure changes).

The Nazari and Saadi framework was decided upon for the current study as it was the most accessible for students.

2.4.2. Prompt Analysis Based on the Nazari and Saadi Formula

Table 1 provides a breakdown of the Nazari and Saadi (2024) Framework and below it is an example of a structured prompt following this framework:

TABLE 1. NAZARI AND SAADI FRAMEWORK

Component	Task	Improve 5% of the vocabulary in this text.
	Context	To a C1 level
	Instructions	Focus on the changing the words that are not used well
Elements	Role	Imagine you are an English as a second language teacher
	Audience	You are trying to help a student learn new vocabulary
	Tone	The vocabulary suggestions should be suitable for a B2 level English student
	Limit	Do not change the sentence structure in the text
	Example	Provide a list of the changed words after the corrected text

Source: own compilation, based on Nazari & Saadi, 2024 p. 5

Example of a structured prompt following the Nazari and Saadi Framework:

Teach Masters students with C1 Level English (context) how to correct grammatical errors in their essay drafts (task). Focus on upgrading simple and/or incorrect grammatical structures to higher level academic grammar (instruction).

You are an instructor of academic writing (role) to C1 Level international students (audience) who need support to improve the grammar they use for academic essays (tone). The content and coherence of the essay should not be changed (limit). Highlight what you change and why you changed it (example).

By systematically teaching and applying these structured prompt frameworks, students and educators can more effectively interact with LLMs, maximising their usefulness in education, and in particular in language competence development.

Instruction in Prompt Engineering

While research on prompt engineering in educational contexts is still emerging, it is increasingly recognised as a skill that can be taught and developed through structured instruction (Oppenlaender et al., 2023). The ability to craft effective prompts allows students to maximize their use of AI tools like ChatGPT, thus enhancing their learning experience (Eager & Brunton, 2023; Walter, 2024). Although little research has explored how to teach prompt engineering systematically, it seems obvious that instructors play a crucial role in helping students develop these skills (Jacobsen & Weber, 2023; Z. Lin, 2024; Sawalha et al., 2024).

Huang (2023) suggests that students in EFL classrooms benefit from being provided with structured prompts to support their learning. The researcher highlights the many advantages of AI-assisted learning while also acknowledging its limitations when students struggle to formulate effective prompts. To address this issue, Huang supplied students with specific, tailored prompts designed to align with individual learning goals. For example, one prompt given to students instructed them to ask ChatGPT:

"Please review my paragraph and provide feedback on structure, grammatical errors, clarity, coherence, logic, and use of appropriate transitions and cohesive devices. I am not seeking a rewrite, only feedback. (Paste your paragraph here)*."*

Huang noted that while these structured prompts helped students engage with AI more effectively, they required extensive trial and error. The researcher also emphasised that further validation studies are needed to assess the effectiveness of these prompts.

Similarly, Woo et al. (2022) examined how EFL students used ChatGPT to complete a writing task. The findings revealed that, like in Huang's (2023) study, students relied heavily on trial-and-error strategies when drafting prompts. The researchers concluded that without explicit instruction, students struggled to generate effective prompts that yielded meaningful AI-generated feedback.

Despite these findings, there remains a lack of systematic research on how best to teach prompt engineering. While existing studies recognise its importance and potential benefits, little is known about how structured instruction impacts students' ability to generate effective prompts and optimise AI-assisted learning. This gap underscores the need for empirical investigation

into whether explicit instruction in prompt engineering can improve students' proficiency in crafting prompts and, by extension, enhance their learning outcomes.

3. The Study

As discussed above, research has demonstrated that ChatGPT can function as an effective language learning tool, but its successful use requires the ability to craft well-developed prompts. While the importance of *prompt engineering* has been acknowledged, research examining students' ability to independently and effectively prompt ChatGPT remains limited.

This study employs the *cognitive apprenticeship* theoretical framework to investigate three key research questions:

1. How adept are English as a Foreign Language (EFL) university students at independently crafting effective ChatGPT prompts to improve their writing?
2. Do teacher-provided prompts help students engage more effectively with ChatGPT compared to self-generated prompts?
3. From a student perspective, how effective is teacher instruction in prompt engineering?

According to Collins et al. (1991), the cognitive apprenticeship model comprises two key components in teaching:

1. Experts must identify and explicitly demonstrate the processes involved in a task to make them visible to students.
2. Experts must situate abstract tasks within authentic contexts to enhance students' understanding of their relevance.

In alignment with this framework, this study incorporates a scaffolded instructional approach, in which teachers will model effective prompt construction in authentic homework tasks before gradually releasing control to students.

This study employs a mixed methods design (Creswell & Plano Clark, 2018; Johnson et al., 2007) in order to understand whether prompt engineering is a helpful skill that can be taught in EFL contexts. A mixed methods was chosen as it enables the synthesis of our integrative data (e.g. survey responses) with qualitative insights (e.g. analysis of student prompts). This dual approach aligns with recommendations in the field to triangulate data sources for increased validity, especially when evaluating complex educational outcomes such as skill acquisition and AI tool integration (Ivankova et al., 2006).

3.1. Methodology

3.1.1. Participants

This study was conducted with 90 university students enrolled in EFL courses at B1 and B2 proficiency levels at Johannes Kepler University, Linz, Austria. The students were pursuing degrees in sociology, social economics, and business. The participant pool consisted of 40 men and 50 women, with an age range of 19 to 27 years (M = 22.4, SD = 2.1).

Participants were selected through convenience sampling, as they were enrolled in courses taught by members of the research team. This approach allowed for the practical implementation of the instructional intervention within existing class structures. No control

group was created, as the researchers wished to ensure that all students had equitable access to the skill development opportunities associated with prompt engineering instruction. While this decision aligns with the ethical and pedagogical aims of the study, it represents a methodological limitation in terms of experimental control and generalisability. All students participated in the first two surveys; however, due to scheduling constraints, only one class of 23 students completed the final follow-up survey.

3.1.2. Instruments

To assess the impact of structured prompt engineering instruction, students completed three surveys administered throughout the semester, following a progressive scaffolded intervention approach.

Survey 1: Baseline (No Teacher Guidance)

- Purpose: To evaluate students' natural ability to generate effective ChatGPT prompts without explicit guidance.
- Pre-Survey Preparation:
    - No instruction was provided on how to formulate prompts.
    - Students were simply asked to submit their ChatGPT-generated responses to their writing assignments using self-created prompts.
- Survey Structure:
    - Students were asked to rate their confidence using AI with the question "How confident are you right now at writing effective ChatGPT prompts to help with learning?" They were asked to evaluate the statements "ChatGPT is helpful to improve my grammar" and "ChatGPT is helpful to improve my vocabulary," rating each statement from not at all to very helpful.
    - The students were also asked to use ChatGPT to correct one of their homework texts. They input the prompt that they used to complete this task into the survey.

Survey 2: Teacher-Provided Prompts (Nazari and Saadi Framework Implementation)

- Purpose: To assess whether structured prompts provided by the instructor improved students' engagement with ChatGPT.
- Pre-Survey Instruction:
    - Prior to completing the survey, students were given two specific teacher-generated prompts that followed the Nazari and Saadi framework.
    - Vocabulary Prompt:
      "Imagine you are a college English as a second language teacher who is trying to help a student learning new vocabulary. Improve 5% of the lower-level vocabulary in this text to a C1 level. The vocabulary suggestions should be suitable for a B2-level English student. Do not change the sentence structure in the text. Focus on changing the words that are not used well. Provide a list of the changed words after the text."
    - Grammar Prompt:
      "Imagine you are a college English as a second language teacher who is trying to help a student improve their writing. Using Strunk and White writing

guidelines, correct the grammar mistakes in this text. Replace the errors with B2-level correct sentences. Only change text that is grammatically wrong. If there are no mistakes, do not change anything. Provide a list of the errors and changes after the corrected text."

- Survey Structure:
    - Students corrected another homework assignment using AI, using one of the teacher-provided ChatGPT prompts. Students were again asked to input the utilised prompt into the survey.
    - Student confidence in using AI was reassessed, along with the helpfulness of AI for grammar and vocabulary.
    - Their responses were compared to Survey 1 data to analyse improvements in prompt quality.

Survey 3: Student-Created Prompts (Prompt Engineering Coaching)

- Purpose: To assess whether explicit instruction in prompt engineering enabled students to craft their own high-quality ChatGPT prompts.
- Pre-Survey Instruction:
    - Students were introduced to the Nazari and Saadi Prompt Engineering Template, which includes:
        - Context: About what topic?
        - Instructions: What specific steps to do?
        - Role: Who is ChatGPT?
        - Audience: Who is receiving the information?
        - Tone: Describe the style of the writing/interaction.
        - Example: Provide an example of what ChatGPT could do.
        - Limits: What should ChatGPT not do? Include limits on text structure or the number of suggested changes.
    - Students analysed pre-written prompts and evaluated their alignment with the Nazari and Saadi framework.
    - Finally, students drafted their own structured prompts following this framework.
- Survey Structure:
    - Survey three asked students to submit their self-created prompt.
    - They were reassessed one more time to determine confidence in using AI, and for the helpfulness of AI for vocabulary and grammar learning.

Each survey was designed to progressively assess student skill development in crafting ChatGPT prompts, moving from no guidance (Survey 1) to explicit guidance (Survey 2) and ultimately to independent prompt writing (Survey 3).

3.1.3. Procedure

To answer question one “How adept are English as a Foreign Language (EFL) university students at independently crafting effective ChatGPT prompts to improve their writing?” students completed

two surveys, Survey 1 and Survey 3, where they were asked to generate ChatGPT prompts independently. Survey 2 was excluded from the analysis because students were instructed to use teacher-provided prompts verbatim. Prompts from Survey 1 and Survey 3 were analysed using the Nazari and Saadi framework, with each prompt receiving a score based on the inclusion of key structured criteria. Students were assigned one point for each of the following elements incorporated in their prompts: task, context, instruction, role, audience, tone, limit, and example. Each student's prompt received a total score ranging from 0 to 7 points.

TABLE 2. ANALYTICAL FRAMEWORK INFORMED BY NAZARI AND SAADI FRAMEWORK

Criterion	Description	Example
Task	Clearly defines the core action the LLM should perform.	Improve the email.
Context	Provides relevant background information to situate the task.	For an English class assignment.
Instruction	Offers specific, step-by-step directives on how the task should be executed.	Specifically focus on improving the poorly chosen vocabulary words.
Role	Assigns a persona to ChatGPT.	You are an English teacher.
Audience	Specifies the intended recipient of the response.	Make the changes appropriate for a student learning English.
Tone	Indicates the appropriate language style (e.g., formal, conversational). One point was also awarded if the student specified the Common European Framework Reference Level (CEFR).	Make this to a B2 level.
Limit	Describes what should not be done.	Do not change the sentence structure.
Example	Provides sample inputs or expected responses to guide the LLM's output.	Give me a list of changes when you are done.

Source: own compilation, based on Nazari & Saadi, 2024 p. 5

To ensure reflexivity and minimize potential bias in the analysis process for all research questions, the research team engaged in collaborative coding of student responses. The two researchers who conducted the coding brought differing perspectives on the educational use of ChatGPT. While both researchers positively view ChatGPT as a whole, Researcher A sees ChatGPT as a highly valuable pedagogical tool capable of enhancing student learning and engagement. In contrast, Researcher B approaches the technology with greater caution, expressing concerns about its potential to facilitate academic dishonesty. These contrasting stances provided a balanced lens during the analysis. Both researchers jointly analysed student prompts using the Nazari Framework, allowing for continuous dialogue and negotiated interpretation of student responses. This collaborative approach, along with efforts to bracket personal assumptions, helped to strengthen the trustworthiness and rigor of the qualitative findings.

The length of the student prompts in Survey 1 and Survey 3 was analysed using descriptive statistics, including mean and standard deviation. To evaluate differences in prompt quality before and after instruction, a paired *t*-test was conducted with prompt scores as the dependent variable. Prompts were also qualitatively analysed for the presence and structuring of key framework components, documenting thematic differences between Survey 1 and Survey 3 to illustrate qualitative improvements in student-generated prompts following instruction.

To answer research question two: "Do teacher-provided prompts help students engage more effectively with ChatGPT compared to self-generated prompts?" Students' perceptions of

ChatGPT's usefulness, assessed using the questions "ChatGPT is helpful to improve my vocabulary" and "ChatGPT is helpful to improve my grammar" from survey one and two were compared using a *t*-test analysis.

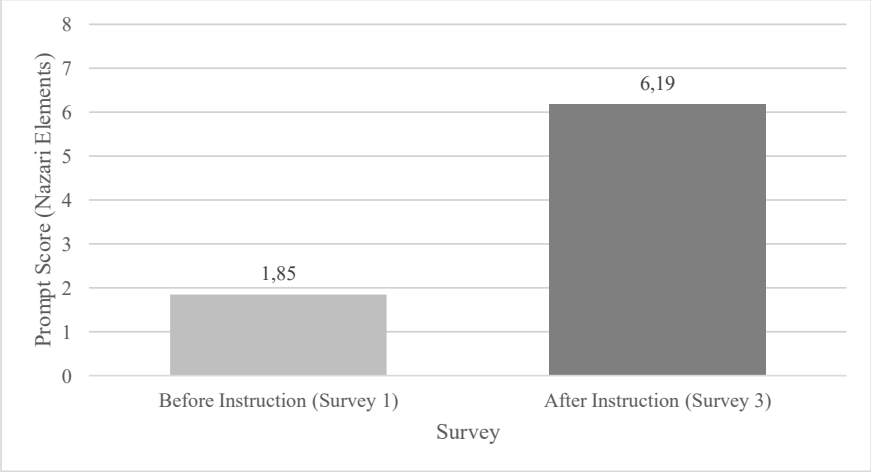
To answer research question three: "From a student perspective, how effective is teacher instruction in prompt engineering?" student confidence in writing ChatGPT prompts was measured across all three surveys using the question, "How confident are you right now at writing effective ChatGPT prompts to help with learning?" After structured prompt instruction, students were asked to rate their confidence levels. The ratings on the survey were compared in three ways. Results in Survey 1 were compared to Survey 2. Survey 2 was compared to Survey 3, and Survey 1 was compared to Survey 3.

3.2. Results

To answer research question one "How adept are English as a Foreign Language (EFL) university students at independently crafting effective ChatGPT prompts to improve their writing?" we first assessed the complexity and detail of student-generated prompts before and after structured instruction by analysing word count differences between Survey 1 (Baseline) and Survey 3 (Post-Instruction). The mean word count increased from 13.35 (SD = 7.49) in Survey 1 to 64.19 (SD = 27.43) in Survey 3. The maximum word count also increased, growing from 38 words in Survey 1 to 135 words in Survey 3, indicating a significant expansion in prompt detail. Additionally, the standard deviation increased, suggesting greater variability in how students structured their prompts. A paired t-test revealed a statistically significant increase in word count after structured instruction, $t(25) = 9.03$, $p = 3.2 \times 10\text{-}9$.

Then, students received one point for each element of the Nazari & Saadi framework (2024) incorporated into their prompts. Subsequently, a paired-samples *t*-test was also conducted to compare prompt scores before and after instruction. The mean prompt score in Survey 1 was 1.85 (SD = 0.78), whereas the mean score in Survey 3 increased to 6.19 (SD = 1.60). This increase was statistically significant, $t(25) = 11.96$, $p = 6.28 \times 10\text{-}11$, indicating a marked improvement in prompt effectiveness following structured instruction. These results are depicted in Figure 1.

FIGURE 1. IMPROVEMENTS IN STUDENT PROMPTS



Note. Mean prompt scores before and after instruction using the Nazari and Saadi (2024) framework. Scores reflect the number of elements successfully included in student prompts (range: 0–8).

A qualitative analysis of the prompts further supported these findings. In Survey 1, most prompts lacked structured elements, with the majority including only the task and minimal contextual details. In contrast, Survey 3 prompts demonstrated a more comprehensive application of the Nazari framework, incorporating multiple structured components such as role, audience, context, and tone. Feature inclusion improved notably, with role specification increasing from 4% in Survey 1 to 92% in Survey 3, audience specification rising from 0% to 81%, and contextual information increasing from 8% to 88%. Additionally, tone guidance improved from 15% to 77%, while the inclusion of examples rose from 0% to 69%.

A comparison of sample prompts illustrates these qualitative improvements. In Survey 1, a typical prompt was, "Can you correct this email for grammar?"—a vague request with limited scope that lacked role specification, audience context, or detailed instructions. In contrast, a Survey 3 prompt demonstrated greater sophistication: "Imagine you are an English as a Second Language teacher. Your task is to correct this email for grammar and improve vocabulary to a B2 level while keeping the sentence structure intact. Provide a summary of corrections at the end." This revised prompt included essential framework components, resulting in a more structured and effective interaction with the AI tool.

To answer research question two “Do teacher-provided prompts help students engage more effectively with ChatGPT compared to self-generated prompts?” a paired-samples t-test was conducted to compare students’ perceptions of ChatGPT’s usefulness for vocabulary improvement and grammar improvement confidence across Survey 1 (self-generated prompts) and Survey 2 (teacher-provided prompts).

A paired-samples *t*-test was conducted to compare students’ confidence in ChatGPT’s usefulness for vocabulary improvement when using self-generated prompts (Survey 1) and teacher-provided prompts (Survey 2). The results indicated that the mean rating in Survey 1 ($M = 8.09$, $SD = 1.89$, $N = 58$) was slightly lower than in Survey 2 ($M = 8.41$, $SD = 1.52$, $N = 58$). However, this difference was not statistically significant, $t(57) = -1.34$, $p = .19$, with a 95% confidence interval for the mean difference ranging from −0.816 to 0.161.

A paired-samples correlation analysis revealed a moderate positive correlation between the two survey responses ($r = .425$, $p = .00038$, one-tailed), suggesting that students’ perceptions of ChatGPT’s effectiveness in vocabulary learning were relatively stable across conditions.

To further assess the magnitude of the difference, Cohen’s d was calculated. The effect size was small, $d = -0.18$ (standardizer = 1.858), with a 95% confidence interval ranging from −0.44 to 0.08. Since the confidence interval included zero, the difference between self-generated and teacher-provided prompts was not perceived as meaningful in practical terms.

A paired-samples t-test was conducted to compare students' confidence in ChatGPT’s ability to improve grammar when using self-generated versus teacher-provided prompts. The results showed that the mean confidence rating in Survey 1 ($M = 7.33$, $SD = 2.18$, $N = 57$) was slightly lower than in Survey 2 ($M = 7.63$, $SD = 1.99$, $N = 57$), but this difference was also not statistically significant, $t(56) = -1.02$, $p = .31$, with a 95% confidence interval for the mean difference ranging from −0.885 to 0.289.

A paired-samples correlation analysis showed a moderate positive correlation (r = .483, p = .00011, two-tailed), indicating that students' confidence ratings remained relatively consistent between self-generated and teacher-provided prompt conditions.

The effect size (Cohen's d) was small, d = −0.14 (standardizer = 2.212), with a 95% confidence interval ranging from −0.40 to 0.13. Since the confidence interval crossed zero, there was no meaningful effect of teacher-provided prompts on students' grammar confidence.

To answer research question three: "From a student perspective, how effective is teacher instruction in prompt engineering?" student confidence in writing ChatGPT prompts was measured across all three surveys. After structured prompt instruction, students were asked to rate their confidence levels.

1. Survey 1 (Pre-Instruction) – Students received no teacher assistance in prompt writing.
2. Survey 2 (Teacher-Provided Prompts) – Students used a teacher-generated prompt before engaging with ChatGPT.
3. Survey 3 (Nazari and Saadi Framework Instruction) – Students received explicit instruction in prompt engineering using the Nazari and Saadi framework.

A repeated-measures design was used, and paired-samples t-tests were conducted to determine whether structured prompt instruction significantly increased student confidence.

Student confidence in prompt writing increased across the three surveys. In Survey 1, the mean confidence rating was 6.22 (SD = 1.98, N = 23). In Survey 2, confidence increased slightly to 6.39 (SD = 2.19, N = 23). Following explicit instruction in prompt engineering (Survey 3), the mean confidence rating significantly increased to 7.87 (SD = 0.98, N = 23).

Paired-Samples *t*-Test Comparisons

Survey 1 vs. Survey 2 (Self-Generated vs. Teacher-Provided Prompts)

A paired-samples *t*-test compared confidence in prompt writing before and after students were provided a teacher-generated prompt. The results showed no statistically significant difference between conditions, $t(22) = -0.51$, p = .617 (two-sided), p = .308 (one-sided). The correlation between Survey 1 and Survey 2 was moderate (r = .694, p = .0001, one-tailed), but the effect size was small (d = −0.13, standardizer = 1.642). The 95% confidence interval (−0.52, 0.31) included zero, indicating no meaningful change in student confidence when using a teacher-provided prompt.

Survey 1 vs. Survey 3 (No Assistance vs. Prompt Instruction)

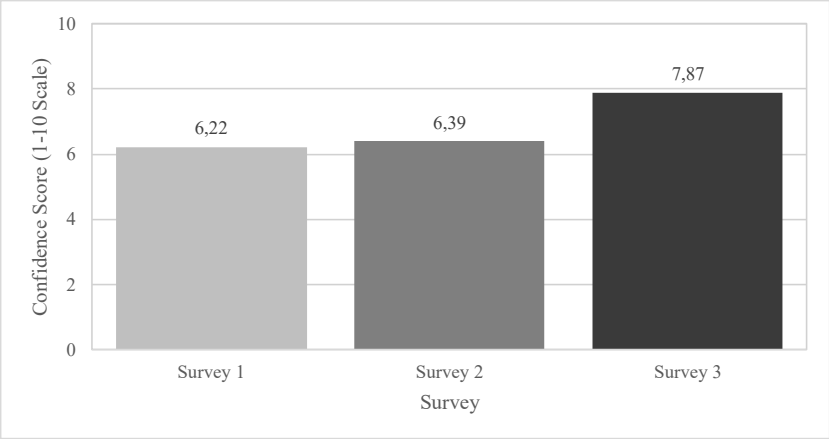
A paired-samples t-test comparing Survey 1 (no teacher assistance) and Survey 3 (explicit prompt instruction) revealed a statistically significant improvement in student confidence, $t(22) = -4.07$, p = .00068 (one-sided and two-sided). The correlation was moderate (r = .277, p = .10), and the effect size was large (d = −1.95, standardizer = 1.945). The 95% confidence interval (−1.32, −0.36) did not include zero, confirming a meaningful increase in confidence after structured prompt instruction.

Survey 2 vs. Survey 3 (Teacher-Provided vs. Prompt Instruction)

A paired-samples *t*-test comparing Survey 2 (teacher-provided prompts) and Survey 3 (explicit prompt instruction) found a statistically significant increase in student confidence, $t(22) = -3.30$, $p = .003$ (two-sided), $p = .002$ (one-sided). The correlation was moderate ($r = .261$, $p = .114$, one-tailed), and the effect size was large ($d = -2.15$, standardizer = 2.150). The 95% confidence interval (−1.14, −0.23) confirmed a substantial improvement in confidence following explicit instruction.

The improvements in student confidence across all three instructional phases is depicted in Figure 2.

FIGURE 2. IMPROVEMENT IN STUDENT CONFIDENCE IN PROMPT WRITING



Note. Self-reported confidence in prompt writing increased across three surveys. Ratings were based on a 10-point scale (1 = Not Confident, 10 = Very Confident).

4. Discussion

The findings of this study highlight the effectiveness of explicit instruction in prompt engineering for EFL students. The statistically significant increase in prompt scores (Research Question 1) and word count following structured instruction suggests that students who receive guidance in prompt construction can develop more comprehensive and structured interactions with AI tools. The increase in word count aligns with improved prompt structure, as students incorporated more elements from Nazari and Saadi framework (2024), such as task, role, audience, context, and limits. These results support the cognitive apprenticeship model, which emphasises the role of explicit modelling and scaffolded learning in skill acquisition (Collins et al., 1991).

The qualitative analysis for Research Question 1 further reinforces the impact of instruction on prompt design. In Survey 1, students' prompts were typically vague and lacked critical structural elements, reducing their effectiveness in AI interactions:

"Write this email with more advanced vocabulary."

"Rewrite this text by using B2 level."

Having received instruction, students demonstrated a greater ability to specify role, audience, context, and limitations, leading to more precise and functional AI-generated responses:

"Act as if you were my personal English teacher, helping me to improve my vocabulary in my text. Improve the vocabulary in my text so that it corresponds to C1 level without changing the

sentence structure. However, the new vocabulary should be chosen so that I can still understand them with my B2 level. Make sure that the meaning of the text is retained and that there are no grammatical errors. Focus on accuracy and clarity. Provide a list of the errors and changes after the corrected text."

These findings align with prior research emphasising the importance of structured input in optimising AI-assisted learning experiences (Huang, 2023, Nazari & Saadi, 2024). Additionally, the significant increase in role specification and audience awareness suggests that students not only refined their instructions but also began considering the communicative context of their AI-generated responses, an essential skill in academic and professional writing.

For Research Question 2, although teacher-generated prompts led to slight increases in students' perceived usefulness of ChatGPT for vocabulary and grammar improvement, these differences were not statistically significant. The small effect sizes and confidence intervals including zero indicate that the impact of structured prompts was minimal. However, the significant correlations suggest that students consistently viewed ChatGPT as a valuable tool for language improvement, regardless of prompt structure. These findings indicate that while structured prompts may slightly enhance engagement, students already benefited from ChatGPT's feedback even when using self-generated prompts. Future studies could explore whether more advanced scaffolding techniques, such as iterative feedback or adaptive AI-generated prompts, yield greater benefits in perceived usefulness.

The findings for Research Question 3 suggest that explicit instruction in prompt engineering significantly improved student confidence in generating effective ChatGPT prompts. The small and non-significant difference between Survey 1 (self-generated prompts) and Survey 2 (teacher-provided prompts) ($p = .617$, $d = -0.13$) suggests that merely using a teacher-generated prompt did not enhance confidence. However, the large effect sizes and statistically significant differences observed when comparing Survey 1 vs. Survey 3 ($p < .001$, $d = -1.95$) and Survey 2 vs. Survey 3 ($p = .003$, $d = -2.15$) indicate that explicit instruction in prompt engineering was highly effective in improving student confidence. These results demonstrate the value in explicit modelling and scaffolded instruction to facilitate skill acquisition and self-efficacy as expounded by cognitive apprenticeship theory (Collins et al., 1991). While teacher-provided prompts alone were insufficient, structured instruction using a framework (Survey 3) led to substantial increases in confidence. This finding underscores the importance of active learning and structured guidance over passive exposure to AI-generated prompts.

These results reinforce the importance of structured AI instruction in education. Simply providing students with pre-written prompts is not enough to enhance engagement or confidence in using AI effectively. Instead, explicit instruction in prompt engineering frameworks—such as the Nazari framework—can significantly improve students' ability to engage meaningfully with AI tools. Educators integrating AI-based writing tools in EFL classrooms or other writing-intensive courses should consider explicitly teaching students how to construct structured prompts rather than simply providing effective prompts.

4.1. Implications for AI-Assisted Learning

1. **Scaffolded Prompt Instruction is Essential**: Without instruction, students struggle to structure AI prompts effectively, leading to suboptimal engagement with ChatGPT.
2. **Nazari and Saadi Framework Enhances AI Communication**: By incorporating structured components, students maximize AI utility, improving learning outcomes in writing and vocabulary acquisition.
3. **Potential for AI in EFL Education**: Given the improvement in student prompts, structured AI usage could complement traditional language instruction by enhancing writing skills and critical thinking.

5. Limitations and Future Research

Despite these promising results, the study has certain limitations. The sample size was relatively small, and for Survey 3 it was even smaller due to missing data from the business students. These factors certainly limit the generalisability of the findings to a broader population of EFL learners. Additionally, the study focused on the immediate effects of instruction and did not assess the long-term retention of prompt engineering skills.

Future research could address these gaps by conducting longitudinal studies to investigate whether students retain structured prompt-writing skills over time and whether continued practice enhances proficiency. Comparative studies could also be beneficial, particularly in evaluating the Nazari and Saadi framework against alternative prompting strategies to determine the most effective approaches for AI engagement. Furthermore, research could explore the role of peer collaboration in AI prompting, examining how collaborative prompt generation influences learning outcomes, student engagement, and confidence in using AI tools. These future directions would contribute to a more comprehensive understanding of effective instructional approaches for developing prompt engineering skills in EFL contexts.

6. Conclusion

This study underscores the critical role of explicit instruction in AI prompt engineering, demonstrating a significant improvement in students' ability to craft effective ChatGPT prompts. Based on the lacklustre response to teacher-generated prompts, i.e., where confidence levels were not improved, it seems students feel more invested in their own, self-generated prompts. The findings suggest that structured guidance enhances AI-assisted learning, particularly in EFL education. Having developed such skills while at university, students offer future employers what is increasingly going to be required as standard in many industries: AI competence and digital literacy skills. Future research should explore long-term impacts, cross-framework comparisons, and iterative feedback mechanisms to optimize AI integration in academic settings. By equipping students with structured prompt-writing skills, educators can foster more meaningful AI interactions, ultimately enhancing writing proficiency and critical thinking in language learning contexts.

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Conflict of Interest
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Data Availability
Data supporting the conclusions of this study can be made available upon reasonable request from the corresponding author.

Open Access Agreement

Gen AI usage

In the preparation of this manuscript, the authors utilised ChatGPT to enhance readability, coherence, and adherence to academic writing conventions. Specifically, ChatGPT provided recommendations for refining vocabulary, improving sentence structure, and strengthening transitions between ideas. The tool was also employed to align the manuscript with APA 7th edition formatting guidelines. However, all references were independently sourced, verified, and analysed by the authors to maintain academic rigor and integrity. Researchers attempted to use ChatGPT to help code data, but found that the AI was not effectively able to code based upon a researcher framework.

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