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Breaking the Freeze :Chatbot Supported Learning to overcome Cognitive Blockages during the Academic Performances, Perspectives from the English Language Students in Salhi Ahmed University Center of Naama, Algeria

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Abstract:

Rapid technological advancements in artificial intelligence (AI) and its applications have fundamentally transformed numerous fields with education being no exception. The current study aims to explore the potential of generative chatbots to overcome cognitive paralysis widely known as learners' frozen thoughts and to ameliorate their academic performances. AI-powered text generators, such as Open AI's GPT, Google Gemini and QuillBot have been in a widespread used among students of English as a foreign language (EFL). Using a quasi-experienced mixed method approach, 90 third year English language university students were divided into control and experimental groups. While the experimental group utilized chatbot aid when performing an academic writing task, the remaining group did the task without support. The pre and post- task assessments revealed that chatbot- supported learners experienced fewer mental blocks and exhibited better task performances. Additionally, the data collected showed that the group of students used chatbots feel emotionally comfortable which

results in a more prompting mental processes and an unfreezed thinking. The study underscores the need of the generative AI which may be used as a cognitive scaffold for the students.

Keyword: Academic performance; Cognitive blockage; EFL; Generative chatbots; scaffolding..

1. 1. Introduction

The academic success is undoubtedly built upon the students ability to be engaged inthe cognitive practices like reasoning, problem solving and written productions. Yet, learners struggle with cognitive blockages which hinder the abilities to initiate tasks or to complete them effectively. These frozen thoughts effect negatively the students' performances and lower their motivation even thought possessing the requested knowledge. Thus, this research paper aims to investigate whether chatbots are able to stimulate cognitive processes and help students to overcome their thinking blocks especially in ideational tasks.

2. Cognitive Paralysis

Cognitive paralysis also known as frozen thoughts, is a psychological state of mind characterized by a shing feeling of being mentally blocked. This temporary status can effect significantly the academic performances of the students especially in productive and ideational tasks. Additionally, these stressful situations may cause difficulties in recalling acquired information or even initiating or completing specific tasks. These deficiencies lead to increasing challenges in learning and retaining new knowledge because of the rise of stress and the lack of motivation and self confidence.

3. Generative Chatbots in Education

Generative AI is a type of AI tools, it refers to some softwares that can be used to create new content taken from large varieties of data of different sources. Well-known generative AI tools are ChatGPT, Microsoft Copilot and Google Gemini as Dianio (2024, 26) explains: “ AI text generators are tools powered by the artificial intelligence that create human- like content. They use machine-learning large models such as Natural Language Processing (NLP) to generate text from user input”.

Generative AI chatbots play a significant role in revolutionizing the traditional methods of education to a new level which is more engaging and help learners to become more attentive and interactive and even more motivated to be integrated in the learning process. (Mittal et al, 2024).

Text generators have become recently very popular among young researchers in mostly all educational levels since they are supposed to save time and efforts. These tools are especially utilized in the activities that require productivity.

4. The Influence of Chatbots Integration on the Students Productivity

The ongoing development of the multiple digital technologies enhancing the broadening of the learners intellectual growth. Recent studies (Russel & Norvig, 2021, Open AI, 2023, Dionio, 2024) have pointed out that integrating novel applications improves the learning outcomes as well as the metacognitive behaviour. The different AI tools create new opportunities for both the teachers and the students since they arise the awareness in the learners by providing intelligent assistance such as the ICALL which stands for the Intelligence Computer-Assisted Language Learning. These innovative pedagogical approaches improve learning

through the provision of personalized feedback and a dynamic response to the students progress. (Lichae, 2023)

AI text generators chatbots can improve the students cognitive productivity by providing assistance in the following tasks:

- Helping in the refinement of the target language: by spotting the grammatical errors and correcting the spelling mistakes
 - Strengthening the writing skills: through paraphrasing, reformulating, readability checking and so forth.
 - Refining translations: by avoiding boring contents that do not stick after word-by word translations.
 - Improving the formality of the written exerts by helping the students to transform daily conversations into well structured academic passages
- (Zawacki et al, 2019)

Hence, chatbots text generators can support learners in developing their abilities, boosting efficiency and increasing the precision of their written work. These tools encompass automated writing programs and language processing technologies. They have revolutionized students writing process by hardly repetitive and time-consuming tasks and thereby freeing students to concentrate more on creative elements of writing.

AI tools do not threaten teachers but rather enhance learning by supportingcreativity, problem-solving, and discussion skills. They provide personalizedfeedback, track student progress, and make fair, ongoing assessment feasible, evenin large classes. When used thoughtfully, AI text generators

can actually strengthen critical thinking by helping students brainstorm, question, and refine ideas. Zhang and Da (2023) and Lee (2023) emphasize that students exposed to diverse AI-generated viewpoints learn to evaluate and adapt content, building analytical skills. Studies by Piskovsky and Vithanage (2022) show that active, mindful use of AI can boost learner autonomy and cognitive control. Practically, AI tools can handle grammar and structural corrections, freeing students to focus on argument development (Al-Shammari & Al-Dakhis, 2022). Mistakes made by AI can prompt students to reflect more deeply, turning “error-spotting” into critical engagement (Kohnke et al., 2023). Research shows mixed findings overall. While overreliance is a concern, careful use of tools like ChatGPT, Grammarly, and QuillBot can support higher-level thinking. ChatGPT, for instance, gives interactive feedback that pushes students to challenge assumptions and reorganize ideas (Tang et al., 2024). QuillBot helps students practice paraphrasing accurately, which builds understanding and critical reading skills (Kurniati & Fithriani, 2021). Bishop (2023) argues that educators should focus less on whether AI is “cheating” and more on how it can encourage deeper thinking and synthesis. EFL students themselves report that AI tools help them reflect on complex theories and clarify ideas, despite some limits in personalization (Bishop, 2023). When integrated wisely, AI can support not replace students’ independent thinking and academic growth.

boundaries and a risk of superficial learning. Moreover, writing aids like Grammarly, designed to improve grammar and structure, may reduce students’ awareness of their own linguistic and rhetorical weaknesses. While they enhance surface accuracy, they can foster passivity in the revision process, discouraging learners from critically reviewing their choices (Gerlich, 2025). This overreliance undermines

metacognitive awareness and limits students' ability to self-correct—skills essential for writing proficiency and critical thinking (Zhai et al., 2024). The debate over AI's role continues, particularly its potential impact on students' creativity and originality, with some educators warning that excessive dependence may suppress learners' unique voices.

5. Methodology

The study employs a quasi-experimental mixed method drawn to investigate if the utilizations of chatbots is able to alleviate cognitive paralysis and improve the academic writing outcomes. Additionally, the research incorporates both the qualitative and the quantitative methods so as to triangulate data on the two variables of the study; the cognitive processes as well as the task performances. By using pre and post- tests alongside reflective surveys, the research seeks to develop a comprehensive understanding of the impact of chatbots assisted learning on learners who are facing cognitive blockages.

As for the participants, the study included a purposive sample of 90 third year English language students from Salhi Ahmed University Centre. The participants were divided into two groups; an experimental group, composed of 30 students helped by generative chatbot to complete their writing task while 60 students in the control group accomplish the same topic without chatbot support.

In addition to that, several instruments were used to collect more data such as a questionnaire delivered to all the students in both groups, it served as a quantitative and qualitative tool to assess students' perceptions and experiences with AI text generators (such as ChatGPT, Google Gemini, and QuillBot) and their impact on

critical thinking and writing skills. The questions were designed to measure the students' views on how AI tools affect their writing, idea generation, and critical thinking. Then, a selected writing task about a standardized argumentative passage aligned with the students' academic program was chosen. The topic of the chosen essay was designed to be of moderate difficulty and intended to stimulate cognitive efforts. Lastly, a reflective interview conducted after the task composed of some open-ended questions designed with the aim of investigating the participants' personal experiences with the usefulness of chatbots as well as their impressions of the interventions.

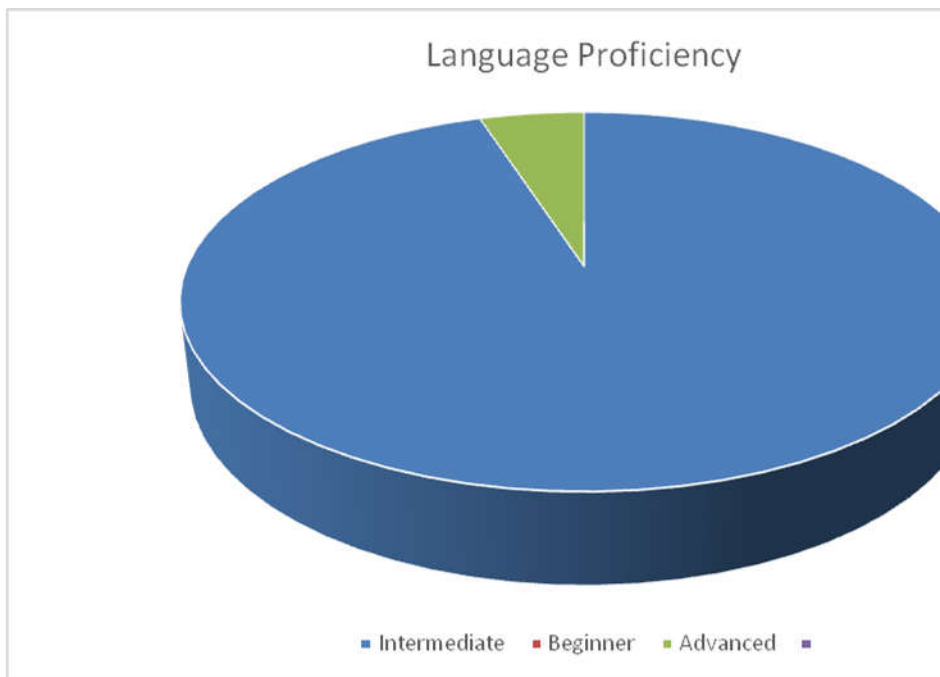
6. Results and Discussions

The collected data from both the different instruments were analysed using both quantitative and qualitative methods. Quantitative data; the data from the questionnaires were analysed using descriptive statistics (e.g., frequency counts, percentages) to identify trends in students' perceptions of AI's impact on their writing production. This allows the researcher to quantify how often students use AI tools and whether they believe these tools enhance or hinder their academic. The open-ended questions were analysed thematically. Qualitative Data, however, collected through the structured interviews and the data is analysed using thematic analysis. This provides deeper insights into the teachers' perspectives on AI integration and its effectiveness.

When asked about their levels of proficiency of the language, most of the students in both groups claimed that they have an intermediate level as presented below:

7.

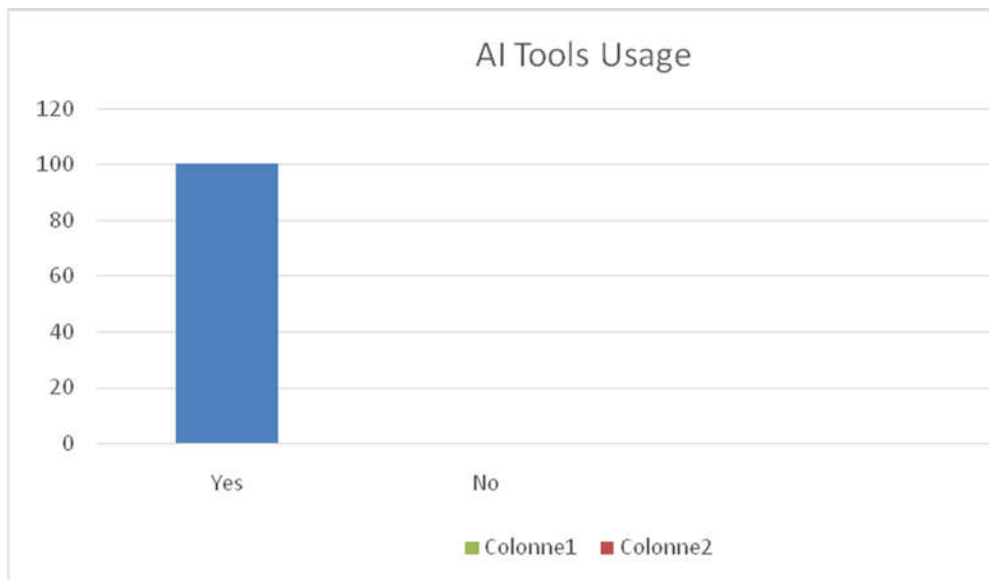
Figure 01: Students Language Proficiency



As presented in the above graph, most of the participants have the same levels of proficiency in the English language, this homogeneity helps to control for potential variability in performance due to language level and ensures a more focused analysis of the study's core variables.

When asked about the use of the AI tools such as ChatGPT, Gemini, Quillbot and Canva to provide support while performing an academic productive task, the students' answers were presented as follows:

Figure 02: AI Tools Usage



The diagram illustrates participants' responses to whether they have used AI tools such as ChatGPT, Gemini, or Canva in academic writing. All of the participants (100%) responded "Yes", indicating universal use of AI tools among the two groups. There were no responses indicating non-use, making the diagram a single-color column representing complete agreement; thus, all the participants are familiar with using the AI text generators.

As for the quantitative analysis used paired-sample t-tests comparing pre- and post-task CPQ (Cognitive Paralysis Questionnaire) scores, as well as independent-sample t-tests to compare performance between the experimental and control groups, it is represented as follows:

- The *experimental group* showed a statistically significant reduction in cognitive paralysis indicators, while the control group showed only a slight reduction .
- Academic performance as rated by the rubric improved more in the experimental group than in the control group

These results show clearly that chatbot-supported learning have positive influence on both the cognitive flexibility and task performance outcomes.

Qualitative data was analyzed through thematic coding of student reflections and interview responses. Four main themes emerged:

➤ **Cognitive Reintegration**

Many participants in the experimental group described how the chatbot helped them “get started” or “restart” their thinking after the cognitive blockage. For example, one student stated:

“At first, I was completely stuck because I didn’t know how to start my introduction. The chatbot suggested a sentence starter, and then my ideas began to flow.”

➤ **Supportive Care and Relief from anxiety**

Students emphasized the alleviation of anxious feeling and stress-free nature of interacting with the chatbot. This lowered their affective barriers and allowed them to engage cognitively. For instance:

“I felt less anxious asking the chatbot questions because I didn’t fear being judged, unlike with a teacher.”

➤ **Organizational Guidance**

The chatbot’s ability to paraphrase, interpret, or

summarize information helped students develop a structured flow in their work. One student claimed:

“Whenever I froze, I typed in my rough thoughts, and it helped me structure them logically.”

➤ **Opposition with the Control Group**

Control-group participants frequently reported sustained psychological obstacles, lack of confidence, and time loss:

“I kept deleting my first sentence again and again, so I ran out of time.”

“I couldn’t organize my ideas because I felt blocked, and there was no one to help me.”

The data analysis shows a consistent pattern: students who had access to generative chatbot support were better able to overcome cognitive paralysis and complete academic tasks with higher quality and more confidence. These learning outcomes were characterized by both **cognitive and psychological facets**, emphasizing the crucial role chatbots can play in the learning process.

In addition to what has been stated, chatbot-supported learners displayed increased fluency in idea generation and task progression. Students confirmed that chatbot instructions helped them "unlock" their thinking, serving as a link between mental blockage and successful output. This corresponds with **Vygotsky’s Zone of Proximal Development (ZPD)**, where the chatbot is considered as a form of mediated assistance just slightly beyond the scope of what the learner can achieve independently. These technological tools did not provide answers completely but instead scaffolded thought different processes such as offering paraphrasings, examples,

substitutions and enquiries designed to simulate interactions between the peers or their teachers.

Psychologically or from an **affective and emotional perspective**, learners in the experimental group consistently ensure that their stress and anxiety are reduced and their motivation to take intellectual risks are higher. Additionally, one important character of the chatbot is its judgment-free nature which provides a psychologically supportive environment significantly essential for the learners who try to improve themselves and pass their fear of failure. These results support **Krashen's Affective Filter Hypothesis**, which states that emotional factors such as stress, restless and anxiety can block the cognitive production in the various academic settings. Through lowering this effective filter, chatbots provided conditions for more effective mental engagement.

For the **control group**, in contrast with the experimental one, stayed without any support during the moments of the cognitive freezing. Many students expressed their struggles when initiating tasks, and get "stuck" in the mid-way of the accomplishment of the activity, or feeling disable to organize their ideas under the pressure. Moreover, this group produced shorter, less coherent, and less sophisticated responses, proclaiming that the unavailability of actual assistance intensified the cognitive blockages and influenced negatively the academic outcomes.

Importantly, some students in the experimental group showed early signs of **excessive dependence** on chatbot inputs, using it not just to unblock ideas but to drive the majority of their content creation. While this did not affect task performance in the short term, it raises pedagogical questions about how to **promote critical and reflective use** of AI tools to ensure that

learners remain cognitively active rather than passive consumers of generated contents.

To conclude, the patterns indicate that generative chatbots can function as both **cognitive and mental aids** as well as **emotional control strategies**, helping the learners regaining an ongoing mental engagement during the academic performances. These insights offer strong support for their thoughtful integration into learning contexts—particularly those that involve writing, problem-solving, or ideational productions. However, more future implementations must be designed to balance **support with skill-building**, ensuring that chatbots empower rather than replace human thinking.

8. Suggestions & Recommendations

In order to ameliorate the use of these technological tools by the students and with the purpose of avoiding the total dependence on them, some suggestions are academic recommendations are proposed:

- ❖ *Training Participants in some Different Optimal Strategies* :Students should be trained on how to interact with chatbots in a purposeful way. This may include:
 - Propose clear, specific, and task-based questions.
 - Employing additional prompts and refining initial draft ideas instead of relying on the first attempts.
 - Develop and enhance critical thinking through iterative dialogues with the chatbot.
- ❖ *Integrating Chatbot Use into Curriculum with more Critical Reflections*: teachers should integrate AI use into the different classroom activities and encourage students to reflect critically on:
 - What the chatbot can provide,
 - How it influenced their thinking,
 - What they would accept, reject, or review.

❖ *Present Chatbots as Scaffolding, Not Substitution* :Students should understand that the chatbot's role is to support thinking—not replace it.

❖ *Design AI-Assisted Assignments* :Instructors can propose assignments that *require* AI engagement but also include:

- Reflection logs on chatbot interactions,
- Justification of edits or changes,
- A comparison between student-created and AI-suggested content.

❖ *Educate Students on Ethical Use of these Technologies*: Introduce basic principles on:

- Plagiarism and authorship rights
- Transparency in disclosing AI use

❖ *Customize Support for Students with Anxiety or Cognitive Blocks* :Offer targeted chatbot-based interventions for students who:

- Experience test or writing anxiety,
- Have executive function challenges (e.g., ADHD),
- Struggle with idea generation or structuring.

❖ *Encourage Cross-Disciplinary Use Beyond Writing* : Promote chatbot use not just for writing, but also for:

- Idea mapping in research,
- Clarifying concepts in STEM,
- Practicing language skills (in EFL/ESL settings),
- Debating multiple perspectives in philosophy or ethics.

9. Conclusion

This study set out to explore whether generative chatbots—specifically tools like ChatGPT—could serve as effective support mechanisms for students experiencing cognitive paralysis, often described as "frozen thoughts." The findings

provide compelling evidence that chatbot-supported learning can help students regain mental momentum, reduce anxiety, and improve the overall quality of their academic performance.

Quantitative results showed significant improvements in both cognitive fluidity and task outcomes among students who used chatbots. Qualitative insights further revealed that chatbots offered valuable cognitive scaffolding and emotional reassurance, enabling students to initiate and complete tasks they may have otherwise avoided or abandoned. These results support the theoretical frameworks of the Zone of Proximal Development and cognitive offloading, highlighting AI's emerging role not just as a tool, but as a form of responsive intellectual companionship.

However, the study also underscores the need for guided, reflective, and ethical use of such technologies. As generative AI becomes more integrated into educational contexts, students must be equipped with the skills to use these tools critically and responsibly—balancing external assistance with internal cognitive engagement.

In short, generative chatbots have the potential to transform how we support learners—particularly those who struggle with ideation, anxiety, or cognitive inhibition. When thoughtfully implemented, these tools can help “break the freeze” and open the door to more confident, creative, and autonomous academic expression.

References:

1. Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*.
2. Bailey, S. (2011). *Academic writing: A handbook for international students* (3rd ed.). Routledge.

3. Bailey, S. (2018). *Academic writing: A handbook for international students* (5th
4. Baddeley A.D. (2012). *Working Memory: Models and Controversies*. Annual Review of Psychology. Annurev-psych- 120710- 100 422.
5. Gladwin T.E., Hashemi M.M., Van Ast V.A., (2016). *Ready and Waiting: Freezing as Action Preparation under Threat*. Neuroscience Letters, J.Neulet.
6. Paul, R., & Elder, L. (2014). *Critical thinking: Tools for taking charge of your learning and your life* (3rd ed.).
7. Pearson. Paul, R., & Elder, L. (2014). *The miniature guide to critical thinking: Concepts and tools* (7th ed.). Foundation for Critical Thinking.
8. Russell, S. J., & Norvig, P. (2021). *Artificial Intelligence: A Modern Approach* (4th ed.). Pearson.
9. Roseberry T., Kreitzer A., (2017). *Neural Circuitry for Behavioural Arrest*. Philosophical Transactions of the Royal Society B: Biological Sciences. 372 (1718), 20160197.
10. Swartz, R., & Parks, S. (1994). *Infusing the teaching of critical and creative thinking into content instruction: A lesson design handbook for the elementary grades*. Critical Thinking .Press and Software.