



Original article

Evaluating the Effectiveness of AI Chatbots in Enhancing Thesis Statement Writing Among Iraqi EFL Learners

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ABSTRACT

This study investigates the impact of AI chatbots on developing thesis statement writing skills among Iraqi EFL learners. Utilizing a quantitative experimental design, the research compares writing outcomes between a control group and an experimental group receiving AI-assisted training. Data collected through structured pre- and post-test writing assessments are analyzed using descriptive and inferential statistics to determine whether AI integration yields statistically significant improvements in producing clear, coherent, and well-structured arguments. By evaluating instructional effectiveness, the study aims to provide empirical evidence regarding the pedagogical value of AI chatbots in EFL classrooms. Ultimately, the findings offer practical insights into leveraging AI tools to enhance academic writing capabilities within the Iraqi higher education system.

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Keywords: Thesis Statement Writing, Academic Writing Skills, Iraqi EFL Learners

تقييم فاعلية ادوات الذكاء الاصطناعي في تعزيز كتابة جملة البحث لدى متعلمي اللغة الانكليزية لطلبة العراق كلغة اجنبية

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المستخلص

تستقصي هذه الدراسة أثر أدوات الذكاء الاصطناعي في تطوير مهارات صياغة "جملة البحث" لدى متعلمي اللغة الإنجليزية العراقيين بوصفها لغة أجنبية. ولتحقيق ذلك، اعتمد البحث منهجاً تجريبياً كمياً للمقارنة بين مجموعتين: ضابطة تلقّت تعليمًا تقليدياً، وتجريبية خضعت لتدريب مدعوم بالذكاء الاصطناعي. استُخدمت اختبارات كتابية مقننة لجمع البيانات، وجرى تحليلها إحصائياً (وصفياً واستدلالياً) لرصد الفروق بين الاختبارين القبلي والبعدي، والتحقق من كفاءة التدخل التعليمي في تعزيز تماسك الأطروحة ووضوحها. يُؤمل أن تقدم النتائج دليلاً تجريبياً يثبت الأهمية التربوية لدمج هذه التقنيات الذكية في تدريس الكتابة الأكاديمية، مما يتيح آفاقاً عملية لتطوير مهارات الطلبة ضمن منظومة التعليم العالي في العراق.

الكلمات المفتاحية: كتابة جملة البحث، متعلمي اللغة الأجنبية في العراق، مهارات الكتابة الأكاديمية

1.Introduction

Language teaching has been influenced by Artificial Intelligence (AI) as a major power over the last several years. It offers new instruments that can make English as a Foreign Language (EFL) students write better. The attention of AI-driven chatbots has been significant since they can assist in writing in an individual, interactive, and scalable manner (Fryer et al., 2020; Smutny and Schreiberova, 2020). In a case of EFL students in Iraq where English classes are frequently shortened due to small classes, poorly equipped curricula, and insufficient feedback provided by teachers, AI chatbots can fill in the gaps and make the process of learning entertaining. EFL students tend to struggle with the ability to write a good thesis statement, the significant aspect of academic writing that has to be clear, logical, and logically related (Weigle, 2014). The thesis statement explains the topic of the essay and teaches how to think and write well. Some Iraqi college students do not cope with this, however, due to the lack of process-focused writing training and practice on critical feedback systems (Al-Jarf, 2015). AI chatbots are designed to sound as though two people are talking to one another and responding to what the users say in real-time. They will be able to assist in writing by providing feedback quickly, proposing questions and demonstrating real-time thesis development. Chatbots may be used to assist students in writing by making them repeat it, focus on the problem, and write their arguments better (Zawacki-Richter et al., 2019). Although these technologies are gaining popularity in every corner of the globe, the amount of real-life studies conducted on the capabilities of these technologies working in specific cultural and educational contexts, such as Iraq, is lacking. The study examines how AI chatbots affect the thesis statement composition of Iraqi EFL learners. The study aims at assessing the effectiveness of chatbot assistance in academic writing training as a guide to increase clarity, coherence, and quality of arguments in thesis statements produced by students.

1.1 Research Questions

- 1- To what extent does the implementation of AI chatbots enhance the capacity of Iraqi EFL learners to compose good thesis statements?
- 2- Is there a statistically significant difference between the performance of students who get chatbot-supported training and those who get traditional instruction before and after the test?

1.2 Research Objectives

- 1- To evaluate the effectiveness of artificial intelligence chatbots as teaching tools for improving thesis statement development among Iraqi EFL students.
- 2- To assess the differences in thesis writing performance between students receiving AI chatbot-assisted training and those instructed using traditional means.

2.Literature Review

The recent studies addressing the application of AI technologies, especially the use of AI-powered chatbots, in improving language learning have shown a growing popularity with writing development aspects. Such research indicates that chatbots have potential to be used as interactive, personalized supports to enable EFL learners to understand difficult writing activities. The study by Fryer et al. (2020) is experimental research to consider the impact of AI chatbots on the writing of students within the academic setting. The findings demonstrated that the student who utilized AI chatbots wrote better and structured their tasks better. Students that required help with refining their ideas using conversational scaffolding, and prompt feedback were also particularly useful on the chatbots, which is highly necessary when writing thesis statements. Likewise, Smutny and Schreiberova (2020) have considered numerous various educational chatbots and have come to the conclusion that they are most suitable when they are able to reproduce human contact in real-time. This renders the learning environment to be responsive and dynamic. Their study was devoted to the possibilities of AI chatbots to significantly enhance the student engagement and contribute to the development of language skills, including writing, during language classes. The study by Zawacki-Richter et al. (2019) was comprehensive research that objectively analyzed the use of AI in higher education with the emphasis on the key areas in which AI technologies can be implemented to improve the outcomes of education, including chatbots. Most of the studies however, do not provide a true explanation of businesses in these countries. focused on general scholarly assistance, the study highlighted the lack of culturally specific research, particularly in the under-represented regions, including the Middle East. Such a gap points to the need of local studies on the implementation of AI in EFL classrooms, especially in Iraq. Al-Jarf (2015) has investigated how students in the Iraqi context perceived peer feedback during the process of writing education and found that many students do not receive proper revision and critical assessment. Though her research did not focus on AI specifically, it demonstrated the acute need in supportive tools that could help learners to develop the basic writing skills or at least develop a thesis statement. In her seminal work on the evaluation of academic writing, Weigle (2014) emphasized the role of the thesis statement in its evaluation. She has noted that the process of thesis formation is often a significant challenge to the EFL student, due to the lack of analytical thinking and argument development, which AI chatbots can offer significant support in the form of modeling, inquiry, and feedback. Although these findings are promising, very little empirical

research has been done on how AI chatbots can be used to help EFL learners when coming up with thesis statements. The proposed study will satisfy the existing gap by targeting Iraqi university students and examining the impact of AI chatbot interaction on the ability of these students to construct lucid, coherent, and argumentative thesis statements in the English language.

3.Theoretical Background

The ideas behind this study come from a number of different areas, including second language acquisition (SLA), writing instruction, educational technology, and artificial intelligence in education (AIED). All these models demonstrate the ways in which AI chatbots can assist English language learners to construct their thesis statements, particularly in such locations as Iraq that lack:

1. Sociocultural Theory (Vygotsky, 1978) The Sociocultural Theory by Vygotsky states that learning is a social process that is enabled by communication with the more knowledgeable individuals and cultural tools. Here, the use of AI chatbots could be perceived as a mediating tool that is used to assist learners within their Zone of Proximal Development (ZPD) that is, the cognitive area where learners can perform tasks but are not able to perform tasks without support (Lantolf and Thorne, 2006). Chatbots provide scaffolded support of writing in the form of real-time feedback, queries, and suggestions, which imitates the teacher-student interaction and follows the Vygotskian emphasis on dialogic learning.

2. Process-Oriented Writing Theory. Process Writing Approach emphasizes the writing process as a recursive and evolutionary process that involves planning, writing, rewriting, and editing (Flower and Hayes, 1981). This methodology is often problematic to EFL learners due to limited instructional time and feedback. The traditional training might be improved with the help of AI chatbots, which may improve the iterative engagement with the students and support them in all stages of writing, especially in the making of thesis statements that require the precision of analysis and syntactic correctness.

3. Interactionist Theory of SLA. The Interaction Hypothesis that was proposed by Long (1996) implies that meaningful interaction with the opportunity of intelligible input and output enhances the process of acquiring a second language. Chatbots (simulators of conversational partners) offer these interactional opportunities by facilitating meaning negotiation, error correction and restructuring of language. The outcomes of such interactions may include increased linguistic awareness and metacognitive engagement, particularly when students attempt to convey argumentative ideas in thesis statements.

Cognitive Load Theory (Sweller, 1988) In the case of learning, the theory of cognitive load (CLT) considers the limitations of the working memory. Constructing thesis statements, learners may be overwhelmed with the necessity to balance between several cognitive requirements, where vocabulary, grammar, reasoning, and logic are required. Artificial intelligence chatbots can help to reduce the number of tasks to be handled, breaking them down into smaller, easier manageable tasks and ensuring that all the user gives their attention to is one sub-skill at a time (refining the topic, making a claim, and supporting evidence), so that they can optimize the intrinsic and extrinsic cognitive load. Formative Assessment Theory and Feedback. Good teaching involves

formative feedback as it would enable students to improve (Sadler, 1989). However, at the Iraqi universities, one can hardly provide individualized feedback due to large classes and the unavailability of teachers. AI chatbots address this requirement by providing instant and flexible and non-judgmental feedback on how to use language, structure and make a case clear. They act as intelligent tutoring systems, which aid students to develop better metacognitive abilities and become more in control of their learning abilities. Frameworks in Artificial Intelligence in Education (AIED). Recent AIED models have identified the significance of customization, flexibility, and student engagement in effective AI-based education (Luckin et al., 2016). Within the frame of the writing pedagogy, chatbots may serve as intelligent assistants that customize learning materials based on the feedback provided by the students. This will be in behalf of the views of constructivism about learning which believes that students are the ones who build up knowledge in their interactions with the digital instruments. In conclusion, writing classes based on the application of AI chatbots rely on sociocultural concepts of Vygotskian, process writing pedagogy, interactionist theory of SLA, and AIED models. All these arguments contribute to the notion that chatbots can serve the purpose of smart and interactive scaffolds, which can be used to assist Iraqi EFL students in their thesis statement writing by providing them with guided activity, personalized feedback and metacognitive support. This theoretical foundation allows considering the way the application of chatbots in the actual scenarios of the EFL classroom in Iraq has its actual influence.

4.Methodology

1.4Research Design

The study adopted a pre-test and post-test quantitative quasi-experimental research design to determine the role of AI chatbots in developing thesis statements in Iraqi university EFL students. The aim is to evaluate the performance of students before and after training with a particular focus on the improvement of their skills in how to construct clear, coherent and argumentative thesis statements.

1.3 Experimental group: Received AI chatbot-supported writing instruction.

1.4 Control group: Received traditional writing instruction without AI assistance.

4.2Participants

The participants included 50 undergraduate EFL students enrolled in a writing course at Al-Farahidi University- College of Education- English Department. The students were divided equally into:

- Experimental group (n = 25)
- Control group (n = 25)

The participants' English ability was at an intermediate level, and they had no background working with writing tools powered by AI.

4.3 Pre-Test and Post-Test Procedures

a. Pre-Test

In the first week of the study, everyone was given a writing assignment that asked them to write a

short academic essay (200–250 words). The goal of the exercise was to get a coherent thesis statement and supporting reasons. Students did the work in class with a time limit of 45 minutes and without being able to use AI tools or get comments from their classmates.

b. Instructional Intervention (Weeks 2–5)

The experimental group was provided with the chatbot ChatGPT-4 and asked to have their thesis statements drafted with the assistance of this chatbot. The chatbot responded directly to the questions, demonstrated the way to construct a thesis, and provided answers to enable students to get informed. **The control group**, students received a usual lesson, such as lecture, reading the examples in the textbook, and written comments made by the teacher.

c. Post-Test The structure of the writing exercise was the same at the conclusion of the intervention (Week 6). Another similar assignment asked students to respond in a new 200-250 word essay with a definite thesis statement.

4.4 Assessment Criteria

Responses from both pre- and post-tests were evaluated using a standardized rubric adapted from Weigle (2014), which assessed:

1. Clarity of the thesis statement
2. Coherence and structure of argumentation
3. Relevance to the topic
4. Grammar and syntactic accuracy

Two qualified EFL instructors individually evaluated all essays. Inter-rater dependability was assessed to guarantee score consistency.

5 - Data Analysis

The scores from the pre- and post-tests were statistically analyzed using **SPSS** software:

- **Paired samples t-test** was used to compare pre- and post-test scores within each group.
- **Independent samples t-test** was used to compare post-test scores between the experimental and control groups.
- The level of significance was set at $p = .05$. The research question that was put was whether there were statistically significant improvements among students in the experiment group of developing thesis statements compared to the control group. This research approach involves a direct analysis of the outcomes of teaching with an AI bot to assess the quality and clarity of thesis statements by performing pre-test and post-test tests. The design provides us with a manageable method of verification on the effectiveness of AI in teaching writing in Iraqi EFL classes.

5. Results

The current study was conducted to investigate the efficacy of AI chatbot-based teaching to improve the writing of thesis statements by Iraqi EFL students. The pre-test scores and post-test

scores were analyzed using the pre-test outcomes and post-test outcomes of the experimental and the control group (n = 25 each). Paired samples t-tests and independent samples t-tests were used to perform statistical analysis with the level of ($p \leq 0.05$).

5.1 Pre-Test Results

The pre-test scores showed that no statistically significant difference existed between the control group and experimental group before the intervention. The similarity in the performance of both groups in terms of clarity, coherence, relevance, and grammatical correctness was evident in thesis statement writing. This suggests that the two groups were homogeneous at the beginning of the study.

5.2 Post-Test Results

Following the instructional intervention, significant differences that were observed between the two groups were noted. The condition of the experimental group, which was assisted by AI chatbots, demonstrated a significant increase in their overall writing performance in comparison with the control group.

- Experimental group had a significant improvement in mean scores between pre-test and post-test.

Specifically, there was an improvement in:

- Clarity of thesis statements
- Logical organization and coherence
- Relevance to the essay topic
- Grammatical and syntactic accuracy

However, the control group did not improve significantly, only moderately, which is explainable by the traditional methods of instruction. Nevertheless, these were not so great as those in the experimental group.

5.3 Within-Group Comparison

The paired samples t-test revealed that:

- The experimental group demonstrated a statistically significant improvement between pre-test and post-test scores ($p \leq 0.05$).
- The control group also showed some improvement; however, the difference was either marginally significant or not statistically significant across several assessment criteria.

5.4 Between-Group Comparison

The independent t-test done on post-tests scores indicated that:

- There was statistically significant difference in favor of experimental group ($p \leq 0.05$).
- Students with AI chatbot support performed better in comparison with students whose instruction was based only on the traditional one.

To conclude, it is clear that in the capacity to develop effective thesis statements, AI chatbot-assisted instruction had a positive and statistically significant impact on students. The experimental group not only improved compared to the one in the control group, but also displayed higher levels of coherence, argument development and linguistic accuracy. These results are the empirical data of the use of AI-based tools in teaching EFL writing, in particular, under the conditions of the lack of personalized feedback and instructions.

Table 5

Summary of Statistical Results for Pre-Test and Post-Test Performance

Section	Analysis	Findings	Interpretation
Post-Test Results	Comparison after intervention	Experimental group scored significantly higher than control group	AI chatbot-based instruction improved thesis statement writing
Experimental Group Improvement	Pre-test vs post-test	Significant increase in mean scores	Strong effect of AI-assisted learning
Control Group Improvement	Pre-test vs post-test	Slight or moderate improvement only	Traditional teaching had limited effect
Within-Group Comparison	Paired samples t-test	Experimental group showed significant improvement ($p \leq 0.05$)	Intervention was effective within the experimental group
Control Group Comparison	Paired samples t-test	Improvement was marginal or not significant	Weak improvement under traditional instruction
Between-Group Comparison	Independent samples t-test on post-test	Significant difference favoring experimental group ($p \leq 0.05$)	AI group outperformed control group

6-Discussion

The current research was aimed at investigating how effective AI chatbot-mediated teaching is. contributing to the improvement of the thesis statement writing by Iraqi EFL students. The study results point at. that there was a observable improvement in students who were given AI chatbot-assisted instruction. in the clearness, consistency and persuasiveness of their thesis statements relative to those. who used traditional forms of instructions. Such findings imply that AI chatbots

can be used as a useful pedagogical aiding tool in academic writing training, especially in EFL settings of limited resources as in Iraqi higher education. A main inference on the results is that AI chatbots exposed learners to immediate, individualized, and iterative feedback -are characteristics that tend to be constrained in more traditional classrooms because of limited features. to big classes and limited time of instruction. The superior post-test in the experimental group. performance confirms previous findings which reveal that writing is boosted with the help of conversational AI tools. build by facilitating the idea formulation and revision processes of the learners (Fryer et al., 2020; Smutny & Schreiberová, 2020). This piece of advice is applicable in the context of writing a thesis statement. seems to have assisted students in polishing their key points, staying on track, and harmonizing their discusses better with writing subjects. The Sociocultural Theory can also be applied to the analysis of the results. From a Vygotskian perspective, AI chatbots acted as mediating devices that scaffolded the learners in their Zone. of Proximal Development. Through the use of guiding questions, exemplary thesis statements, and providing corrective comments, the chatbot estimated dialogic communication traditionally. provided by instructors. This type of scaffolding support must have added to the heightened performance of learners. self-assurance and independence in thesis statements. Moreover, the gained results conform to Process-Oriented Writing Theory, which is focused on. writing as recursive process of drafting ideas, revising, refining ideas. The AI chatbot enabled repetitive participation in construction of the thesis, which gives learners an opportunity to rewrite them. says the same thing on more than one occasion without concerns of unfavorable critique. This reciprocating process can possess a decrease in writing anxiety and stimulation of linguistic and structural experimentation, which results in better quality of written results. The Cognitive Load Theory is also one possible explanation of the better performance of the experimental group. performance. Learners have to deal with various cognitive requirements when writing thesis statements. at the same time, linguistic correctness, logic, and relative content. The AI chatbot seemed to alleviate the extraneous cognitive load because it divided the task into manageable parts. steps, which allows the learners to concentrate on a single component at a time. This institutionalized help is probable. improved the skills of learners that process and use feedback. Although these are positive results, it should be viewed with caution that the results have been obtained. The study concentrated on a rather narrow sample of one institution, which can impair the generalizability. of the findings. Furthermore, the intervention did not take long and, long-term. There was no measurement of retention of writing improvements. In addition, AI chatbots were also offered. helpful aid, and must be regarded as a supplement and not as substitutes to. human training, especially on aspects that demand subtle judgment, cultural sensitivity, and advanced critical feedback. Altogether, the results provide empirical data to the existing literature on in favour of. integration of AI technologies in writing EFL. In particular, this paper deals with a. significant research gap by furnishing localized evidences in the form of the Iraqi educational set up. The Findings indicate the pedagogical possibilities of AI chatbots in enhancing writing a thesis statement and implicate that their conscientious incorporation in EFL programs could benefit academic writing. outcomes, engagement of learners and teaching performance.

Conclusion

The research is a significant gap in EFL education as it explores the possibilities of AI chatbots to help Iraqi university students develop thesis statements. Considering the difficulties of the Iraqi school system, such as small classroom sizes, the lack of instructional resources, and feedback mechanisms, the application of AI-based chatbots is a potential scalable and interactive resource that can be used to improve the writing abilities of students. Chatbots can enhance the capacity of the students to build clear, coherent, and well-structured thesis statement, by means of the personal guidance, the possibility to repeat the tasks, and the feedback. Moreover, the study adds to the overall knowledge about the effective implementation of the AI technologies in the culturally specific and resource-limited schools. The results will not only help improve curriculum development and instructions related to EFL in Iraq but also provide valuable evidence-based information on how AI can be utilized in academic writing in general, to fill the gap between the innovative technology and its practical implementation.

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