

THE USE OF CHATBOTS FOR PERSONALIZING FEEDBACK IN HIGHER EDUCATION

Melouka Ziani¹¹ Abdelhamid Ibn Badis University

Faculty of Foreign Languages

Mostaganem, Algeria

melouka.ziani@univ-mosta.dz

Abstract: Artificial Intelligence (AI) has become ubiquitous, facilitating learning, including the feedback process. In fact, AI tools can be used for ‘tracking students’ progress’ (Skrabut, 2023). One of the key benefits of using AI in feedback is its ability to provide instant and personalized feedback allowing learners adjust their own learning. Besides, AI can also eliminate biases and subjectivity in feedback, ensuring a fair and objective evaluation. The present paper tries to investigate the effectiveness of AI tools for getting feedback. To achieve this purpose, an experiment was implemented to test our hypothesis. Zaplingo, an AI language model was used to see the efficiency and effectiveness of the language model in providing feedback. Some questions were addressed to the application, and then the answers and comments were identified and analyzed. The findings show that the language model provides constructive feedback, at the level of the structure, grammar, spelling, punctuation and capitalization that can enhance the writing skill. In addition, AI tools can enhance the feedback process and ultimately lead to better language learning. Yet, it is necessary not to exclude the role of the teacher in guiding the students to the best possible outcomes.

Keywords: Artificial intelligence, autonomy, formative feedback, Chat bots

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¹ Corresponding author : Melouka Ziani ORCID ID : <https://orcid.org/0000-0001-7918-6511>

1. Introduction

The main goal of instruction nowadays is guiding learners to autonomous learning and acquisition of competencies that allow them face the twenty-first century challenges; among these is the mastery of English and specifically, English communication skills. Thus, the integration of technology for pedagogical purposes is not a choice but rather a must. Indeed, conventional teaching approaches and tools are to be brought up to date with sophisticated ones. In this regard, technological tools and applications are used for pedagogical purposes, making teaching less ponderous and more effective. As a pedagogical endeavour, feedback is often a daunting task for a teacher since it requires personalized assistance. In addition to grades, the teacher is required to provide learners with specific observations on their weaknesses and suggesting alternatives for improvement. The present paper investigates the effectiveness of the use of AI applications for pedagogical purposes; mainly for formative feedback. It delves into the exploration of AI applications as pedagogical tools to enhance learning and formative feedback, specifically. To examine this issue, the following question was addressed:

How can AI tools assist learners and help them overcome their weaknesses in writing?

Accordingly, we assume that AI tools can support learners by offering timely, constructive feedback, ultimately making language acquisition more natural, immediate, and effective.

2. Literature Review

2.1. AI Challenges

The obvious prevalence of Artificial Intelligence (AI) nowadays is changing our perceptions of the world surrounding us. It is omnipresent in all fields; at home, at work, for leisure, etc. and has become part of our daily lives by performing tasks that used to rely on human intelligence only. Its ability to perform easily and effortlessly is limiting the tasks of many of us by accomplishing hard activities that used to require thousands of hours and immense efforts to be achieved.

Moreover, numerous applications, ranging from facial recognition to self-driving cars, language translation, virtual personal assistants, and even medical diagnosis are emerging daily, affecting the world's economic, industrial, medical domains and education is no exception. Obviously, the integration of AI tools in education has become pervasive in order to cope with the requirements and needs of the twenty-first century generation. This latter is using different software and applications; hence, it needs to have a more up-to-date pedagogy that matches their profiles and enhances their autonomy. As far as instruction is concerned, its main goal is helping learners acquire knowledge independently and seek out information necessary for their own cognitive development. For this purpose AI tools are used as pedagogical means, assisting learning and making it more effective and autonomous.

2.2. AI in Education

In view of the global changes in education, the introduction of technology for pedagogical purposes continues to surprise both teachers and students alike, transforming the way we teach and learn. In fact, the use of computers, smart whiteboards and projectors have made the teaching profession easier, interactive and enjoyable. Yet, the use of computers, tablets, and smartphones in education has rapidly evolved into more advanced and sophisticated tools, giving birth to artificial intelligence, an intelligence that imitates human thinking but operates effortlessly and efficiently. Accordingly, teachers as well as learners are seeking new tools that save time and maximize positive outcomes. The use of AI tools, for generating content, assisting in translation, providing equivalents and correction has transformed the teachers and learners' minds and behaviours. In addition to their different use for pedagogical purposes, AI tools are being used to track students' progress, offering valuable insights into their learning journey' (Skrabut, 2023) or as a strategy to

give effective feedback and positive reinforcement', making learning and self-evaluation more effective (Weller, 2023).

2.3. AI and Feedback

Feedback is not only an essential component of effective learning but a challenge that should be resolved (Obo, 2022 P6). Its various forms, whether verbal or written, assist students in identifying their strengths and limitations and taking steps to improve their weaknesses. Research has demonstrated the power of feedback on students' progress. In fact, summative evaluation may not be a good indicator of the students' level; on the contrary, it may be a source of neglect and loss of interest and motivation. Thus, constructive feedback is personal and immediate; providing assistance and a chance to the learner recognize his weaknesses and remedy on the spot. Effective feedback should be specific, timely, constructive, and goal-oriented, with the purpose of helping students identify areas of strength and areas that need improvement (Tutunaru P39).

Undeniably, the teacher plays a crucial role in providing feedback. Yet, with the number of students in class, it is often challenging and time consuming to give every single student feedback and help them overcome the weaknesses and deficiencies they face. Therefore, we should look for other alternatives to alleviate those hardships of feedback through the integration of modern assessment tools that can allay and palliate the feedback process. By providing regular feedback to students, teachers can help them understand where they are excelling and where they need to focus their efforts (Tutunaru, 2023 P 38).

Moreover, immediate feedback plays a crucial role in helping students identify their weaknesses and make necessary adjustments to improve their learning (Zhai et al, 2021). Formative feedback, being immediate, also allows learners to gauge their understanding of the material and identify areas where they need to focus more.

This type of feedback also motivates students and improves their self-confidence (O'Neill, 2010), by acknowledging their efforts and progress. Additionally, immediate feedback allows for timely interventions and corrections, preventing learners from developing misconceptions or incorrect understanding of the material. It also promotes active learning by encouraging students to reflect on their work and take responsibility of their learning process. Noticeably, immediate feedback plays a crucial role in enhancing learning, performance, and cognitive development by providing individuals with timely and constructive information. In fact, according to cognitivists, the child's cognitive development occurs with the interplay of experience and autonomy. Experienced individuals assist the learner to individually search knowledge and improve cognitively within a specific space called Zone of Proximal Development (ZPD). According to Vygotsky it [ZPD] is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (1978 P 86).

ZPD, a key concept in educational psychology suggests that learners can achieve better learning outcomes when assisted than when they learn alone. ZPD explains how individuals' cognitive knowledge grow with the help of more experienced persons, building constructive and autonomous learning. Based on this idea, we can suggest that AI tools replace the teacher's assistance and lead learners to effective learning outcomes. The substitution of the teacher by AI tools is beneficial to all; relieving the hard task of personal assistance for the teacher and helping the learner overcome their weaknesses.

Conventionally, formative feedback was restricted to teachers only based on their observations and assessments of students' work, where sometimes subjectivity interferes. Indeed, teachers' subjectivity and personal biases can sometimes affect their feedback, which can be a hindrance to students' cognitive and psychological growth. However, with the advancement of AI technology, there is now the potential for a more personalized and efficient approach to formative feedback. In

this context, O'Neill (2010) notes that new technologies open up some efficient feedback opportunities

It goes without saying that no one can replace the assistance and role given by the teacher in helping students. Yet, giving the students the freedom and space they need to improve independently or with their peers is to be strongly encouraged.

In addition to its immediate assistance, AI eliminates any potential biases and provides students with fair and accurate evaluations. Accordingly, AI can be used to personalize learning, provide real-time feedback, and even create entirely new ways of learning. According to Holmes, Bialik & Fadel (2023), AI has the potential to provide every student with their very own personalized learning companion, operating sometimes as a learning partner, other times as a guide through the mass of available learning opportunities.

Whilst AI is able to collect and analyze vast amounts of data, it is helping tracking students' progress and identifying areas of strength and weakness in their learning. This data can be used to provide students with tailored feedback, allowing them to focus on improving specific skills or knowledge gaps. This personalized approach to formative feedback is crucial as it allows students to receive individualized guidance and support, leading to the acquisition of effective outcomes. Moreover, unlike traditional teacher-led feedback, AI feedback is not limited by time and resources. Indeed, with the use of AI for generating content, students can receive feedback on their work instantly, allowing them to make necessary revisions or adjustments on the spot. This real-time feedback not only saves time but also makes the learning process more effective. Furthermore, AI can also make formative feedback more engaging and interactive for students. This approach can help students stay motivated and interested in their learning, ultimately leading to better learning outcomes. Indeed, the aim of formative feedback, unlike summative one (which is the administration of grades to evaluate a task or activity) is to improve learning; helping the learner identify his mistakes, modify and improve his learning (Shute, 2008).

Visibly, AI is revolutionizing the way instruction is delivered, making it more personalized, accessible and effective. Yet, one of the main differences between AI and human intelligence is that the first one is programmed and operates based on algorithms, whereas human intelligence is based on biological processes in the brain that allow for creativity, emotions, and other traits that machines cannot replicate. Additionally, human intelligence has the ability to learn and adapt in ways that AI cannot, due to its complex nature and ability to understand language and context.

3. Methodology

3.1. Context

The purpose of the present paper is to highlight the benefits of Chatbots for formative feedback. In addition to generating content, the application provides links to improve the English language. It also provides custom lessons, as well as exercises in punctuation among other skills, to be solved for the coming day.

It is important to mention that during each interaction with the virtual teacher, suggestions and links are given to the interlocutor for learning English. For the purpose of the study, we were only interested in the immediate feedback, the application provides.

In this regard, and in order to test our hypothesis, we downloaded a free language model application for writing ; Zaplingo . With a username and password, we could easily sign in, ask questions and get immediate feedback. The questions were asked, orally or in a written form. On the one hand, the questions addressed to the Chatbot were purposefully and intentionally asked in order to examine the application's answers. On the other hand, the purpose was to identify the types of comments the application may provide.

3.2. Procedure

Zaplingo , a language model application was used as a research tool. The study lasted for six months, from May 2023 to December 2023. Once signed in, interaction with a virtual interlocutor is immediate. The interlocutor introduced herself saying ‘*my name is Laura, your English teacher*’. Then added, ‘*how can I help you?*’. And immediately an exchange of questions and answers started.

The study is experimental and purposeful. The experiment lasted for approximately six months. Yet, the use of the application was not used on a regular basis. The application, as a writing assistant, generates content and helps its users become proficient in writing. Instructions are given to the application verbally or in written form. Accordingly, the application was used intentionally to collect data both on our oral and written queries. The questions were purposefully administered to the application to get formative feedback. The questions were not prepared but asked on a variety of topics because the aim of the use of the application was not to obtain content but on the feedback, it provides.

Here are some of the interactions with Laura, the researcher’s interlocutor. The following conversation is the original exchange between the researcher and the application with no modification or corrections.

Researcher : hi. I would like to learn English

Laura : hello! I'm Laura, your English teacher from Zaplingo. I'm here to help you improve your English skills. Do you have any specific questions or areas you'd like to focus on?

Feedback : the original text is grammatically correct and has no spelling errors. It is a well-structured sentence that conveys a clear message. It uses the appropriate verb tense and subject-verb agreement. in this case, the verb "would like" is used to express a polite request or desire.

Researcher: What is the difference between artificial intelligence and human intelligence?

Laura : One of the main differences between artificial intelligence and human intelligence is that AI is programmed and operates based on algorithms, whereas human intelligence is based on biological processes in the brain that allow for creativity, emotions, and other traits that machines cannot replicate.

Feedback : The text is now grammatically correct and free of errors. The only change made was to capitalize the first letter of the sentence and add a space after the period.

Researcher: Thank you

Laura :You're welcome

Researcher :How can we integrate AI with educational psychology teaching ?

Laura :That's a great question! Integrating AI with educational psychology teaching can have many benefits, such as individualized learning paths and personalized feedback.

Feedback :The original sentence is grammatically correct. However, it can be rephrased to be more concise and clear. By placing the noun "teaching" after "educational psychology," it becomes clearer that the sentence is referring to the teaching of educational psychology. Also, changing the word order to "teaching educational psychology" sounds more natural in English.

Researcher :What is the relation between attention and learning?(Question asked orally)

Laura : Learning to embrace tension: how to learn and thrive in difficult situations. When we encounter difficult situations, it's common to experience tension. However, tension doesn't have to hinder our learning; it can actually enhance it. Tension arises when we

encounter something that challenges our current beliefs or understanding. This discomfort can motivate us to seek out new information and ideas, leading to deeper learning. To embrace tension, we need to approach difficult situations with an open mind and a willingness to learn. We should also be willing to engage in self-reflection and self-awareness, recognizing when we're feeling tension and using that as a cue to explore new perspectives.

Researcher : I mean attention and learning

Laura : Oh, my apologies for the confusion. Attention is essential for sustaining our engagement with learning activities, etc.

4. Findings

Table 1.

AI Feedback

Feedback	Type of feedback
The original text is grammatically correct and has no spelling errors. It is a well-structured sentence that conveys a clear message	Positive feedback
The text is now grammatically correct and free of errors. The only change made was to capitalize the first letter of the sentence and add a space after the period.	capitalization
The original sentence is grammatically correct. However, it can be rephrased to be more concise and clear.	Reformulation /sentence structure
"Uh" and "um" are known as filler words, which are used to fill pauses or gaps in speech. However, they do not add any meaning to the sentence and should be avoided in written text.	Use of filler words orally only
The use of "resourceful" is incorrect in this context. A better word choice would be "helpful" or "useful."	Wrong word use
The first letter of a sentence should always be capitalized. In addition, there was a missing period at the end of the sentence.	Punctuation & capitalization
The text is already correctly written, so no changes are necessary. The word "Thanks" is a polite way of expressing gratitude or appreciation, and it's correctly written in this context.	Positive feedback
Finally, the pronoun "me" is correctly used to indicate that the data was given to the speaker.	Positive feedback
Starting a sentence with a greeting like "Hi" requires a comma after it. Additionally, the sentence requires an article "a" to make grammatical sense. A possible rephrased question could be : "How does attention affect learning in the classroom?"	Punctuation
The possessive apostrophe " ' " is necessary to indicate that it is the writing of the student that is being evaluated. Also , the word "writing" should be in the singular form because it is an uncountable noun. Therefore, it is incorrect to use "writings" in this context. The correct sentence is, "How can we evaluate students' writing using AI?"	Punctuation & grammar

Table 1 summarizes the main findings of the study. The two columns explicitly show the observations made by the application Zaplingo. The comments provide feedback at all levels; punctuation, capitalization, grammar, in addition to positive reinforcement when the sentences are correct and free from mistakes.

5. Discussion

Writing for EFL learners often reflects their capacity in mastering the target language. Yet, many foreign language learners find difficulties in producing correct written language at different levels; grammar, punctuation, spelling, etc. Additionally, providing effective feedback on writing is often a daunting task for teachers, as it requires individualized attention and instant intervention. Indeed, formative feedback plays a crucial role in enhancing students' awareness of their weaknesses (Weller, 2023), and guiding them toward improvement (Shute, 2008).

The present study explores the significance and effectiveness of using an AI application, namely Zaplingo, for formative feedback in language learning. To investigate its impact, an experiment was conducted to examine how AI can assist users and personalize their learning experiences.

The findings revealed that repeated interactions with the virtual teacher helped highlight persistent errors in learners' writing. In congruency with Weller's thought (2023), the feedback provided by Zaplingo was not limited to basic aspects of language, such as punctuation and capitalization but extended to language mechanics, including sentence structure and grammar (See table 1). Besides, the application helps students identify some aspects of language, in terms of formality, like the use of filler words, which must not be used in academic writing.

In addition to correcting mistakes, Zaplingo uses positive expressions such as 'That's great' or 'The text is written correctly with no errors'. Undeniably, such feedback encourages students to make more effort, enhancing their self-confidence as stated by Holmes, Bialik & Fadel, 2023. Accordingly, both EFL teachers and learners need to benefit from the advantages of this application to enhance the writing skill, without overreliance on them.

Our study has contributed to some extent to demonstrate the usefulness of AI tools as pedagogical tools and more specifically the role they play in enhancing the writing skill by providing immediate feedback, supporting our hypothesis that states that AI tools may be beneficial for formative feedback. Nevertheless, for more generalizability and validity, further research should be directed towards the application of AI tools by the students themselves. For this purpose teachers, as well as students are invited to use the application and other AI tools for enhancing the writing skill.

Without no doubt, AI applications are quite good, but they are not perfect Scrabut (2023). Therefore, AI users should employ critical thinking strategies when understanding AI feedback to ensure that it is accurate and appropriate. Finally, even though AI applications can be helpful tools, it is still up to the educator to guide and supervise the learning process.

6. Conclusion

The integration of AI tools for pedagogical purposes has certainly led the traditional classrooms witness changes. Yet, these changes may not optimize learning unless they are used adequately. Indeed, coping with technological advancements has become ubiquitous, demonstrated through the implementation of modern tools for pedagogical purposes. In addition to meeting the students' needs, those tools are recognized as enhancing learning and developing many skills, like listening, speaking and writing, to cite a few.

This synergy between traditional and modern methods, can but unleash the students' motivation for their personal growth. Moreover, the use of AI tools to get feedback can significantly contribute to the enhancement of the students' writing skill, in terms of punctuation, spelling, grammar, which constitute the core stone of writing. Notably, once learners recognize the effectiveness and efficiency of AI feedback on their academic achievement, they will demonstrate , not only a positive attitude towards the use of these tools for learning, but also towards writing which is considered as a nightmare for many foreign language learners. Evidently, the present paper reveals

the effectiveness of AI tools; namely Zaplingo, in assisting learners and providing feedback to improve the writing skill among EFL learners.

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