

PAPER

Enhancing Learners' Spelling Skills with an Interactive Chatbot Facilitator

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ABSTRACT

This study attempted to design an interactive chatbot to function as the facilitator for improving spelling skills and elicit students' perceptions of using chatbots in the language learning process. To collect the required data, 60 Omani EFL students were divided equally into control and experimental groups, each with 30 students, to collect the necessary data. Three instruments were used to collect the necessary data, including a newly researcher-designed WhatsApp bot, a perceptions questionnaire adopted from Khan et al. [1], and the NorthStar GCC book series to elicit the vocabulary for spelling practice. The findings disclosed that using interactive chatbots in a learning context improved spelling skills among experimental group participants. Learners who interacted with the bot during the treatment period showed favorable perceptions toward its use in learning. Teachers would benefit from using a WhatsApp bot to send extra materials, allowing students to access materials without time and place limitations.

KEYWORDS

WhatsApp bot, effectiveness, EFL context, spelling skills

1 INTRODUCTION

Artificial intelligence (AI) is a type of advanced technological tool that has been dealing with finding solutions to different kinds of issues in recent years [2], [3]. This modern technological invention was developed to create more techniques and methods for reasoning at higher levels beyond human control [4]. According to [5], chatbots are one of the modern instruments playing functional roles in teaching and learning environments. This technology also provides immediate feedback to users conversationally or interactively [6]. Chatbots have gradually been developed in different fields of study, including commerce, industry, and education. In the educational context, they provide students access to various educational materials [7], [8], [9].

Chatbot-assisted language learning (CALL) focuses on the application of chatbots among language learners to communicate in an actual natural language set up in everyday language use (e.g., communication drills) [10], [11], [12], attempts to solve

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language-related questions (e.g., reading fairy tales) [13], and provides assessments and feedback (e.g., vocabulary test) [14].

Educational chatbots are gaining popularity daily due to their ability to engage students and provide a tailored learning experience at an affordable cost [15]. In the realm of education, chatbots can enhance the learning experience by providing immediate access to course materials [16], duties, practice problems [17], and study resources [18]. Moreover, chatbots can interact with students individually or assist in collaborative learning initiatives [19], [20], [21]. [22] and [23] examined the merits of educational chatbots for students and educators, indicating that they are effective instructional instruments whose advantages surpass their disadvantages, fostering a more efficient learning environment.

Chatbots can provide learners with detailed linguistic information that human interlocutors may not have. A well-developed chatbot can provide additional information that cuts across many phrases, questions, and vocabulary. In addition, chatbots serve as academic helpers that never get tired, delivering free repetitive tasks, such as helping with answering FAQs and maintaining active language use. Chatbots, as learning instruments, are accessible for constant communication between students by allowing them to explore new languages constantly [24], [25].

Spelling proficiency is crucial for developing reading and understanding other abilities related to the English language [26]. [27] suggested a correlation between orthography and literacy, writing, terminologies, and understanding. Constructing sentences with precise orthography is critical, as written communication has become integral to language acquisition in the 21st-century [28]. Students must possess a robust grasp of English orthography, as the lack of their writing is contingent on its precision. Therefore, teachers must aid students in developing orthographic repositories [29]. Aligned with this notion, [28] emphasized the significance of composing sentences featuring accurate spellings because of the increased emphasis on written communication in the 21st-century educational landscape.

In the past, conventional methods of spelling mastery have been associated with the perception of monotony [30]. Subsequently, the researchers recognized the significance of mobile educational trends in facilitating orthographic mastery. There is a considerable abundance of mobile learning platforms on the market. However, it is challenging to determine which platforms are most effective before their utilization and inclusion in studies. A comprehensive understanding of the various categories of mobile learning platforms that facilitate mastery of orthography is crucial for English language instruction and research [31].

Fryer and Carpenter [32] thought intelligent computer-assisted language learning (ICALL) was more beneficial for students with advanced proficiency levels; they evaluated the conversation between two distinct bots with 211 learners and concluded that they might be used for informal discussion-based self-education. [33] and [34] concluded that contemporary chatbots, like mobile chat apps, embedded website services, or wearable technology, could be considered further research topics. [35] stated that implementing educational chatbots in education is a significant strategy for fostering and advancing a more individualized learning experience. [36] and [37] believe that knowing more about the role and functions of chatbots in learning environments necessitates conducting more research studies that mainly focus on chatbots.

Wang and Petrina [38] argued that there is not enough study to measure the efficiency of AIs in language learning. They stated that although the attention to AIs has increased recently, the effect of AIs interaction in learning environments is still scarce. [39] discussed that most of the AI studies in the language-learning context are based on spoken features of AI-student interaction, and there are not enough valuable

studies on the implementation of AIs in writing. Therefore, based on the abovementioned controversies among the literature that supports the implementation of AI and those of opponents, the present paper aims to measure the role of chatbots in language learning. Since there is not enough research on the use of chatbots on spelling improvement of EFL learners, and based on [40] study in which spelling problems in elementary and higher education levels among the students were the most common issues, this study attempts to determine how much the WhatsApp bot can improve Omani students' ability to spell English words and how they view the WhatsApp bot's role within the learning process. The study will, therefore, add to the existing literature about chatbots in education, including functionality, usability, and user satisfaction. It will also keep professionals up to date on chatbot usage in education. It is worth mentioning that very few existing works of literature used third-party websites to be considered as one-way communicative chatbots to conduct the study in educational areas. Still, the present paper used advanced language programming to design an interactive chatbot through the WhatsApp application to be added to the literature, bringing innovation to instructional technologies, especially in the Middle East [41].

The study makes an effort to respond to the following queries:

1. Is WhatsApp Bot effective in improving Omani students' English word spelling skills?
2. How do Omani students feel about utilizing the WhatsApp Bot to practice word spelling?

The following sections of the study focus on the previous studies conducted on the use of educational chatbots, the methods of engaging Omani students, the techniques of developing the interactive chatbot, the procedures of implementing the treatment, the statistical analysis of the data, the justifications over the finding and their relation to other research studies findings, the limitations, and suggestions for further research.

2 LITERATURE REVIEW

This section attempts to cover the most practical studies in the use of WhatsApp in the language learning context and computers in improving the spelling of words.

2.1 WhatsApp in the language learning context

A multitude of studies has elucidated the advantages of WhatsApp in the expansion of L2 vocabulary. [42] compared an experimental group utilizing WhatsApp to submit a sentence-building task with a control group that performed the same assignment in a traditional classroom environment. The experimental group surpassed the control group and demonstrated enthusiasm for utilizing WhatsApp. WhatsApp motivated reticent and insecure class members to articulate themselves more effectively.

Çetinkaya and Sütçü [43] compared vocabulary acquisition on Facebook and WhatsApp while assessing students' perceptions of each network. Informational messages regarding vocabulary were disseminated via Facebook and WhatsApp, including English definitions, Turkish definitions, and illustrative phrases. The scores of both experimental groups were compared to those of a control group that completed the test in a classroom setting. The WhatsApp group surpassed the Facebook group, and generally, students in the experimental groups exhibited positive responses to

utilizing social media platforms and showed significant vocabulary enhancements compared to the control group.

Awada [44] fostered analytical proficiency in writing among university students through the use of WhatsApp. The control and experimental group students were instructed to compose a critique essay with five components. WhatsApp was utilized during the treatment to facilitate communication between the experimental group's teacher and students, enhancing teamwork and proficiency in critiquing. The research findings indicated that the utilization of WhatsApp enhanced the critique writing proficiency of the experimental group relative to the control group.

Khan [45] did a study to assess the impact of WhatsApp on reading motivation and identify the kind of incentive that is effective in the Pakistani EFL environment. The study's findings indicated a significant level of motivation among the participants. Conversely, he found that university officials, specific instructors, and parents had opposed its utilization.

In a separate study, [46] investigated the impact of utilizing WhatsApp to acquire phonetic principles and enhance listening abilities. The experimental group was provided instructions over WhatsApp for four weeks, both in and out of the classroom. Following each week's training, students were required to complete and submit a task to the channel. The investigation revealed no significant disparity between the outcomes of the control and experimental groups regarding transcription posttests. [46] suggested that integrating traditional instructional methods with technological advancements may yield improved outcomes.

3 METHOD

3.1 Participants

This study involved 60 Omani EFL learners randomly chosen from Oman's General Foundation Program (GFP). The participants' primary language was Arabic, and their ages varied from 18 to 19 years. The group comprised both males and females. They were selected from the intermediate English proficiency level based on the university's placement examination. In the mandatory foundation year, students are urged to acquire proficiency in English and other disciplines, including mathematics and information technology skills. The sampled students for this research were those pursuing specialties in engineering, law, business, IT, and education. To evaluate the treatment's efficacy on student performance, 60 students were allocated into a control group and an experimental group, with 30 students each.

3.2 Research instruments

This section is devoted to the instruments used to collect the required data.

Pre-test, post-test, and delayed post-test. The researcher created two sets of pre-tests, post-tests, and delayed posttests to collect the data before and after implementing the treatment to measure the WhatsApp bot's effect on improving English word spelling among the Omani participants. In this investigation, a total of six tests were performed. Each test consisted of two parts, each of which had ten questions, totaling 20 questions for each test.

A listen-and-write technique made up the first section. In this technique, students hear the word before writing it down. Each word will be played once. The second

section included a true or false format. The learners were given the word in the sentence and asked to determine if the word's spelling was correct or wrong. Below, there is an excerpt from each task.

1. Listen to the words and write the words that you heard.
 1. (.....)
 2. (.....)
 3. (.....)
2. Task 2: Select the correct answer with options A and B.
 1. We pay the electricity bills at the end of the month.

A. True	B. False
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Two applied linguistics Ph.D. holders evaluated these sets before the tests were administered to ensure the suitability and validity of the sets. 25 Omani EFL students also piloted the tests at the same college. The reliability of testing was 0.850.

Table 1. The result of the reliability analysis for the six sets of tests

Cronbach's Alpha	N
0.855	60

As stated in Table 1, the reliability of the items was .85, which considers the tests highly reliable.

Perception questionnaire. The researchers adapted a questionnaire from [1] to better understand how students feel about utilizing WhatsApp Bot to practice the spelling of English words. The questionnaire has three sections: the first investigates learners' perceptions of the WhatsApp bot, the second measures the learners' attitudes, and the third analyzes the future behavioral intentions. It is important to remember that the first section of the questionnaire was solely derived from it. The seven-item questionnaire included an Arabic translation of each statement to help students better understand each question. The questionnaire was coded via a 5-point Likert scale, including strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). The fact that this specific questionnaire was chosen for this study was that it had been utilized in several studies [47], [48], [1] as the main instrument, and [40] considered it a tool that perfectly elicits responses from the students and enables their teachers to understand the learners' perceptions better toward AI implementation in learning. [1] measured the reliability of the questionnaire at 0.86 and showed a high-reliability index.

A pilot test with 25 Omani EFL students was conducted to reassess the instrument's reliability due to the deletion and modification of several statements. So, after validating the modified questions by two Ph.D. holders of applied linguistics who were Arabs and familiar with the culture, the reliability test was conducted, and the results showed 0.88, which revealed high reliability.

3.3 WhatsApp bot

A WhatsApp bot was designed using Python to practice spelling words. Then, a local phone number was connected to the bot. Two different kinds of questions were created as part of the treatment. The exercises were in true-false and listen-and-write. The researcher created 10 interactive listen-and-write questions for each set of ten words. In a listen-and-write interactive inquiry, the students received the word's pronunciation

via an audio message from the bot, and they must accurately spell the word on their paper. Whether or not the pupils provided accurate or inaccurate answers, the bot would provide feedback to the students. For the other remaining words, the pupils received a question about whether the word was spelled correctly, and they would need to click true or false to determine whether the word was spelled correctly. The bot will inform the student whether their response was correct or incorrect.

Before beginning the treatment, these questions were modified and added to the bot database. Following pre-test 1, the researchers uploaded the 20 questions for set one in the bot database before the first treatment. Also, the researchers added 20 new questions to the bot database for set two after two weeks, following pre-test two and treatment one. In this process, the researchers concealed the set of one question before conducting the second set of words. Students were given information that included listen-and-write exercises, true-false inquiries, and comments regarding the accuracy of their responses.

3.4 Procedures

The data was collected in the fall semester of 2023. The study's participants were made aware that their participation was voluntary. Both groups followed their teachers' instructions to learn vocabulary and vocabulary spelling. Still, the experimental group could practice word spelling outside the class through the designed WhatsApp bot. The questions could be practiced without limitations. The researcher advised the experimental group, showed them how to practice spelling English words using WhatsApp's bot, and explained what to do in case of technological issues.

This study took four consecutive weeks before it was completed. Before initiating the treatment, a pre-test was given to analyse the spelling knowledge of the learners in both groups. The experimental group used the WhatsApp bot as a facilitator to practice learning and practicing the spelling of words beyond the class. Still, both groups continued to learn and study vocabulary and practiced vocabulary spelling according to the teacher's regular instructions before comprehending the entire process. The students sent messages to the bot during the treatment period, and the bot forwarded the exercises accordingly. The bot let the students know whether their response was correct or wrong so they could learn from their mistakes. Also, the bot corrected the student's responses too. The researchers administered post-test one later on to measure the differences.

The researcher deleted the entire first batch of interactive questions from the bot database during the second week and uploaded the other 20 questions of new words accordingly. The second pre-test, which covered the terms from set two, was then administered to the students from both groups. The researcher then updated set two of the bot database with fresh interaction questions. Listen and write exercises and true or false questions comprising 20 interactive questions. In set two, the same steps as in set one were repeated. Both groups learnt, studied vocabulary, and practiced vocabulary spelling while adhering to the teacher's customary directions. Later, the researchers administered post-test two, the perception questionnaire, and a delayed post-test one to both groups in week four. The delayed post-tests were used to assess spelling performance for both sets of words. The delayed post-test two was given to students in week six.

3.5 Data analysis and results

Primarily, this paper focused on the effects of implementing a WhatsApp bot to measure the English word spelling of the students for two sets of the words that

experimental and control groups received. Table 2 below shows the treatment results of the experimental group that used the WhatsApp bot as a facilitator with their counterparts in the control group that received face-to-face instructions inside the classroom.

Table 2. Research variables in both groups

Variable	Index		Control Group		Experimental Group	
			M	Sd	M	Sd
Spelling	First set	Pre-test	4.37	2.28	4.50	2.42
		Post-test	9.63	2.22	18.40	0.97
		Delayed post-test	6.07	1.53	18.00	1.02
	Second set	Pre-test	5.10	2.59	5.60	2.46
		Post-test	9.03	1.85	18.37	1.22
		Delayed post-test	6.43	1.92	17.97	1.22

Table 2 shows a significant increase in the average scores of the experimental group in the first and second spelling sets in all the tests. The results of the control group were positive but insignificant. Consequently, it may be said that the WhatsApp bot functioned as a practical learning tool to improve students' spelling abilities in the experimental group. Table 3 thoroughly analyses both groups' results for the two sets of words against the timing effect.

Table 3. The results of mixed analysis of variance in spelling scores of experimental groups compared to control group in three stages of research

Variables	Source	Sum of Squares	df	Mean Square	F	p	Partial η^2
First set of spelling	Group	2170.139	1	2170.139	323.134	0.001	0.848
	Error	389.522	58	6.716			
	Time	3070.678	1.319	2328.788	895.071	0.001	0.939
	Time * Group	1119.011	1.319	848.653	326.18	0.001	0.849
	Error	198.978	76.477	2.602			
Second set of spelling	Group	2282.672	1	2282.672	264.572	0.001	0.82
	Error	500.411	58	8.628			
	Time	2377.9	1.385	1716.35	852.633	0.001	0.936
	Time * Group	1023.011	1.385	738.402	366.817	0.001	0.863
	Error	161.756	80.356	2.013			

Table 3 shows that in the first set of spelling, there is a considerable difference between the two groups ($F = 323.134, p < 0.05, \eta^2 = 0.848$). In addition, the above table shows that the main effect of time ($F = 895.071, p < 0.05, \eta^2 = 0.939$) is significant, which means that without considering the groups, the changes in the average scores of all tests are significant. The results of the above table also show that the interaction effect of the group time ($F = 326.18, p < 0.05, \eta^2 = 0.849$) is remarkable too. In other words, there is a noteworthy distinction between the scores of the first set of spelling in the groups' tests.

The results of Table 3 for the second set of spelling show a substantial difference between the two groups regarding the average scores for the second spelling set

($F = 264.572$, $p < 0.05$, $\eta^2 = 0.820$). The results of the above table show that the main effect of time ($F = 852.633$, $p < 0.05$, $\eta^2 = 0.936$) is remarkable, which means that without considering the experimental and control groups, the changes in the average scores from the pre-test, post-test, and delayed post-test stages are significant. The results of the above table also show that the interaction effect of the group time ($F = 366.817$, $p < 0.05$, $\eta^2 = 0.863$) is substantial. In other words, the scores of the second set of spelling in the groups' tests are remarkable.

In Table 4, Bonferroni's post-hoc test was used to investigate the observed differences in the interaction effect of time (pre-test, post-test, and delayed post-test) in both groups.

Table 4. Bonferroni test results for the experimental and control groups

Variables	Group	Stage I	Stage J	Mean Difference (I – J)	P
First set of spelling	Control	Pre-test	Post-test	-5.267	0.001
			Delayed post-test	-1.7	0.001
		Post-test	Delayed post-test	3.567	0.001
	Experimental	Pre-test	Post-test	-13.9	0.001
			Delayed post-test	-13.5	0.001
		Post-test	Delayed post-test	0.4	0.091
Second set of spelling	Control	Pre-test	Post-test	-3.933	0.001
			Delayed post-test	-1.333	0.001
		Post-test	Delayed post-test	2.6	0.001
	Experimental	Pre-test	Post-test	-12.767	0.001
			Delayed post-test	-12.367	0.001
		Post-test	Delayed post-test	0.4	0.082

Table 4 shows the scores of the first set of spelling have changed significantly in both groups, but the changes in the experimental group ($d = 13.9$) are considerably more than the changes of the control group ($d = 5.27$). In addition, the scores of the second set of spellings changed significantly in both groups. Still, the changes in the experimental group ($d = 12.77$) were considerably more than that of the control group ($d = 1.33$).

Table 5 elicits the perceptions of the participants regarding the implementation of the WhatsApp bot for spelling practice.

Table 5. Descriptive analysis of students' perceptions of using WhatsApp bot for spelling

Statement	No.	Min	Max	Mean	Status
Learning word spelling through a WhatsApp bot is a good idea	30	1	5	3.20	High
Spelling through the WhatsApp bot makes learning attractive.	30	1	5	3.56	High
Passing the word spelling-related information through a WhatsApp bot takes less time.	30	1	5	2.90	Average
Learning to spell is suitable through the WhatsApp bot for Writing skills.	30	1	5	2.70	Average
Practising spelling through the WhatsApp bot saves time.	30	1	5	2.65	Average
I use WhatsApp bot to practice spelling with my classmates	30	1	5	2.01	low
Spelling practice through the WhatsApp bot is a fun way of language learning	30	1	5	3.23	high

As shown in Table 5, the participants showed satisfactory perceptions of using the WhatsApp bot in the spelling modules. Among the statements, the bot's effectiveness in making learning environments attractive got the highest student score, with a mean of 3.56. This means the WhatsApp bot positively affected their motivation to participate in the learning environment and process as it provides interaction between students and teachers. The second highest statement was chosen to be the entertaining features of the bot in spelling, with a mean score of 3.23. The WhatsApp bot was also considered a new and entertaining teaching and learning technique for students. The innovative idea of bot and spelling (mean: 3.20) also had a high status. It shows that students were happily convinced to try new ways of language learning, especially using technology in the language learning process. In between, students did not show a positive attitude regarding using the bot to practice any spelling activity with their classmates (mean: 2.01). This reveals that students are not interested in communicating the materials and exercises or practicing the activities with their peers. It shows pupils are more interested in interacting with the bot and their teacher simultaneously.

4 DISCUSSION

The present paper attempted to determine WhatsApp bot's impact on English language learning among Omani EFL learners. The paper focused on whether WhatsApp bots positively or negatively affects the learners' spelling skills. The second part of the study was trying to elicit learners' perceptions of using WhatsApp bot to improve spelling skills. The study's findings revealed that the experimental group performed significantly better in the spelling tests compared to the control group. In addition, the experimental group participants showed a positive attitude toward using AI in the learning process. The bot's interactive and instantaneous feedback, which probably promoted participation and strengthened instruction, is responsible for the experimental group's notable enhancement of spelling. This is reinforced by the participants' favourable reactions regarding the WhatsApp bot, as the originality and simplicity of utilising an established platform to acquire knowledge can boost incentives and lower the actual effort of studying. These elements work together to provide an efficient learning environment that previous techniques would not have, which explains the noted increases in spelling proficiency and positive attitudes among students.

The findings of this study agree with the one by [49], in which they explored the effect of frequent use of WhatsApp on the writing or spelling of 500 Dutch adults in educational environments. The experimental group was primed in the WhatsApp group, while the control group was in a guided task. For the testing part of the study, students wrote stories and completed other tasks to measure computer-mediated communication on productive and receptive writing skills. The experiment group was assigned to chat in the WhatsApp group for 15 minutes. The study results revealed that WhatsApp use was linked with improved spelling-correct language production among the experimental group participants. An explanation for these results could have arisen: messaging through WhatsApp activated or increased the meta-linguistic orthographic consciousness among the participants, producing stories with correct spelling.

In contrast to the results of this study, [50] investigated the use of WhatsApp in education. They conducted a review of 192 published studies in the same area. One of the findings of these studies was that using WhatsApp would lead to harmful effects on spelling and grammar.

In another study against the current paper's results, [51] conducted a study on 50 college students to analyse the impact of text messaging on students' informal writing, specifically the spelling performance of the learners. To collect the data, they selected a closed-ended questionnaire. They discussed that WhatsApp is a helpful communication tool for friends and families. Therefore, the results of implementing texts to improve students' writing performance led to failure. This will cause confusion and double-mindedness among the students while they try to complete their writing. This will cause many spelling and grammatical mistakes. Students will cut the sentences into phrases and short and broken sentences.

The second research question focused on EFL learners' perceptions of using WhatsApp bots to improve spelling. The findings of the present paper align with an investigation by [52], who attempted to investigate the attitudes and views of learners in using mobile phones as instructional instruments in language learning classes. To this end, a researcher-made survey was distributed among the participants accordingly. The findings revealed that learners were positive toward using mobile phone technologies in language learning. In addition, it was found that using mobile phones could help teachers provide more attractive and motivating learning environments for their learners.

Similarly, [53] investigated the attitudes and perceptions of 186 Saudi students on integrating MALL into learning. An eight-item questionnaire was developed and distributed among the learners. The findings proved that the students widely accept mobile learning. In addition, most students declared that using wireless networks in learning environments gives them access to the available learning resources without time and place limitations. Moreover, the technology implemented in mobile phones was perceived as a functional and effective tool in communication and learning.

In another similar study, [54] measured students' perceptions of learning Mandarin language by using WhatsApp. Purposeful sampling was deployed to select the population of this study to participate in a questionnaire adapted from several accessible resources. The experimental group received many materials on various primary language-learning skills outside the classroom via WhatsApp. The study's results revealed a positive stream of participants toward implementing WhatsApp in the Mandarin language learning process. It was also stated that such learning through WhatsApp provides better chances for immediate and continuous feedback, improves language knowledge, and creates a comfortable situation where students feel higher self-confidence.

Mbukusa [55] measured the perceptions of using WhatsApp in English learning. The findings were for and against the results of the current study. Although it was revealed that his research participants enjoyed using WhatsApp, there were some negative findings, too. It was vividly revealed that WhatsApp could negatively impact the performance of higher education students without smart gadgets. WhatsApp was also found to function as a distractor, preventing students from completing their assignments. In addition, WhatsApp was stated to impose some hardship and difficulty balancing online tasks and preparation for an academic context.

In another similar study, [56] examined the factors affecting students' usage and intention to apply the UTAUT2 model. To this end, a sample of 199 Greek students from the School of Humanities and Social Sciences participated in a survey. The results emphasise the anticipated performance, behaviour, and satisfaction associated with various AI systems and applications, which were crucial factors affecting teachers' intentions to utilise them. Furthermore, behavioural intention, habit, and facilitating situations elucidate the utilisation of these artificial systems.

5 CONCLUSION

This study attempted to design and implement a WhatsApp bot to measure its effectiveness as a supplementary tool to improve the spelling skills of Omani EFL learners. The statistical analysis revealed the treatment group's efficient and remarkable performance on spelling tests. Students also had favourable opinions about employing bots to practice spelling and learn English.

The study has simultaneously shown to be highly beneficial to teachers and pupils. The results of this study suggest that using bots to teach languages can help students become more proficient spellers. These bots will thus continue to provide access to the tools that will enable them to advance more rapidly. Since technology and AI greatly impact everyday life and academics, teachers may also utilise these bots to give their students more education, testing, or resources as supplementary tools. This study has several limitations, problems, and suggestions for more research.

However, a few points must be considered as limitations of the study. The study's demographic, which consisted of Omani EFL students at one of Oman's colleges, makes it difficult to extrapolate the results. To draw a conclusion that can be applied broadly, other student competency levels, such as those in elementary, upper intermediate, advanced, and higher education, should also be considered while developing technological education tools. This study targeted one academic semester and conducted the pre-, post-, and delayed post-tests. However, longitudinal studies are suggested to be conducted to better understand students' knowledge after using chatbots in learning. This study focused mainly on the students' perceptions of using chatbots in a learning context. It is worth conducting some studies on teachers' perceptions, who are most probably the designers of chatbots in their academic environment, and monitoring their students' progress accordingly. More studies conducted in other regions of Oman or other countries may result in a more precise map of how technology influences education since each institution oversees its technical tools and resources. The spelling practice tool used in this study was the WhatsApp bot. It is possible to investigate the effects of bots in other apps such as Messenger in more detail. Testing several abilities, such as writing, grammar, and punctuation, to mention a few, could be beneficial.

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