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# ENHANCING IELTS READING AND WRITING SKILLS THROUGH AI FOR SAUDI ARABIAN EFL UNIVERSITY STUDENTS

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## ABSTRACT

The significance of artificial intelligence (AI) in enhancing learning is being recognized the world over. AI tools have been found to be particularly effective in contemporary language classrooms. Perceiving a gap in the available literature, this study aims to examine the efficacy of AI tools in enhancing the reading and writing skills of Saudi EFL learners in the context of the IELTS proficiency benchmarks. AI tools were implemented as teaching aids in the study, which spans one semester at Sattam Bin Abdulaziz University in Kharj. In this mixed-methods study, we used triangulation of data by qualitative and quantitative means. The sample comprised participants from different academic departments to gather data on a variety of perspectives on the contribution of AI applications to IELTS reading and writing skills like supportive community academic environments as well as instructional support courses. The data so collected was subjected to thematic and constant comparative analyses, also paired sample t-test was used to verify the extent of gains attributable to AI. Findings in this study indicate that technology holds immense potential for improving IELTS reading and writing skills among Saudi Arabian EFL university students, although ongoing research is needed to measure its efficacy in different settings. The study concludes with pertinent recommendations for all stakeholders in the Saudi EFL classrooms.

**KEYWORDS:** AI tools, EFL, IELTS, learning success, reading skills, writing skills

## 1. INTRODUCTION

As the demand for world-class university graduates has soared, consistent with the Saudi Vision 2030 economic reform program, both Saudi students and universities in the country need to meet the educational needs of modern Labor markets. Since English has been globally recognized as a lingua franca today, there is burgeoning interest among Saudi students and universities in enhancing their English skills, especially as English is increasingly used as an entry requirement in most scholarship programs for Saudi students to study abroad (World English Journal & Mohammed Ahmed Mudawy, 2024). Thus, as English has been accepted as the main medium of instruction at higher education levels in the country, the development and assessment of EFL learners' language skills, specifically reading and writing, should be seriously taken into account. Moreover, Saudi graduates are intensively expected to have proficiency in English related to English language assessments such as the International English Language Testing System. At the same time, linking universities to local and international research and development has become a fundamental requirement following the Saudi Arabia mission.

In this respect, IELTS has been primarily accepted in Saudi Arabia by most educational institutions as basic proficiency testing for the four macro-skills of languages needed for higher educational levels and is recently used as a primary medium for examination in some research centres and projects. IELTS, as the benchmark for English language proficiency, is mainly taken by Saudi Arabian university students with the purpose of furthering their studies within and outside the country. From these assumptions, it is anticipated that the readiness and preparation for the IELTS could not only enhance English learners' general competence but also develop strategies to perform the test successfully. As the demand for IELTS has soared in Saudi Arabia, many prospective candidates find the test difficult and might consequently need higher proficiency training to get the required band score to be admitted to universities. At this juncture, several strategies and arrangements need to be formulated, specifically for Saudi university students learning English as a Foreign Language. More importantly, the Ministry of Education in the kingdom envisions that several universities facilitate IELTS preparation programs.

## 2. LITERATURE REVIEW

The widespread application of state-of-the-art interactive artificial intelligence (AI) and machine-learning technologies has fuelled gains in educational settings, offering learners access to resources and platforms enriched with globalization, large-scale data, and progressive pedagogies. Seizing the opportunities underwritten by the present wave of AI development, a variety of AI technologies tailored for language and educational purposes could inter alia target socially and economically disadvantaged youth, to provide services through a range of free AI-enhanced platforms and software applications that would consistently track the IELTS preparation course progress of university students, anticipate the challenges and assist in IELTS reading and writing sessions. The ambitious objectives set forth for this AI platform implicated a large scope of relevant AI components to integrate: predictive algorithms for early identification of at-risk learners; adaptive learning paths based on continuous, real-time personal abilities monitoring; automated essay scoring and feedback technologies for self-designed writing prompts; natural-language understanding question-answering chatbots for the IELTS reading module; network of gamified multiple-choice question activities to enhance the IELTS writing tasks; and interactive visualizations, video seminars and explainer bots for skill training and exam tips.

The collaborative project involved peripheral electricity and computer science expertise, participating faculty members and students from the English department are all EFL faculty members and postgraduates with applied linguistic studies, and the conversation dealt with integrating various AI tools, plugins, programs, and applications in the IELTS reading and writing tasks, as well as reading academic journals. Various attended respondents participated in the IELTS exams, specifically the reading and writing modules, described this experience as one of the most anxiety-inducing tests and faced more challenges in these sections when looking for better options, received an immediate response highlighting local printed and online test preparation materials, explained most of these materials to be dated, generic, and unprofessional, never used any online or paid applications for IELTS preparation due to financial considerations and official training programs always seemed to offer a significant advantage, but those were highly competitive and limited, outside a couple of free online exams that replicated the test environment there were no other widely known aids that boost the chances of a high band score and mutual concern addressed inadequate and outdated language teaching practices in public education. This argument conformed with various studies that tackled the low

proficiency of EFL students in Gulf states, attributing this to the passive half-hearted attitude towards learning of the highly tuition-dependent culture, and inadequate teacher qualifications as a significant fraction engaged in private tutoring as a side income and, therefore, showed low engagement in syllabus objectives.

### *2.1. AI in Language Learning*

Language learning and acquisition have undergone dramatic transformations due to the integration of artificial intelligence (AI) applications. AI tools can be leveraged to supplement traditional educational settings and can be utilized outside the classroom to enhance learning methods and outcomes. For instance, intelligent tutoring systems and language learning apps incorporate machine learning (ML) algorithms that provide feedback customized to individual learners, thereby fostering adaptive learning (AlTwijri & Musaed Alghizzi, 2024) ). These systems are optimized to offer an abundance of exercises, thereby allowing students to practice language skills that would otherwise be challenging to develop (Dong et al., 2022). AI has also been frequently integrated into game-based learning systems that typically present a vocabulary-memorization game. On the educational side, these platforms can potentially assist educators in understanding and predicting how students may perform, behave, or require assistance in the learning environment. As a result, it is straightforward to identify struggling students and ascertain when and what type of help to provide. If broadly implementing such technology, it's predicted to have a significant positive impact. AI systems, in this capacity, can identify where a learner may be struggling and provide targeted assistance. Additionally, outside of academia, AI has improved the ability to predict the motivational states of a person given ample data. If educators were informed of learners' motivational states, they could act accordingly to enhance these states. This could even be done automatically by having an AI system adapting the learning environment to make it more engaging for the learner. Though these overwhelming benefits, there are still obstacles in using AI extensively in educational environments. It's challenging to target the proper form of interaction between the learner and AI, so that the tool is optimally advantageous. Because the implementation of AI usually requires a significant amount of work to fit the specifics of the intended learning environment, integrating such tools effectively can prove problematic for educators. However, AI is regarded as a crucial technology for the future development of various learning environments, and so educators should research, develop, and implement it in a proactive manner.

### *2.2. Challenges in IELTS Preparation*

Writing the IELTS can be a significant challenge for many students. Therefore, to help students succeed, it is essential to better understand what these challenges are. The main problem that most students face when preparing for the IELTS is feeling test anxious, which has a significant impact on their reading speed, understanding, and response to questions. When students are under pressure, they are not able to deliver their best performance. Developing effective time management practices when taking the reading test is one of the biggest problems for most students. Moreover, students often fail to answer all the questions in time. Test takers often face reading bonuses, and if students don't read them carefully, they miss the right answer and are confused. Another significant problem is that most students are unfamiliar with the structure of test questions and the format of the test (World English Journal & Farooqui, 2023). Because of this, students often find it challenging to identify the right answer. There are many distractions around them, and it becomes difficult to concentrate and focus on the test. One of the things that hinder students the most is that they do not feel the connection between the IELTS examine and their future life learning.

Lack of interest, motivation, and focus on examination are its common problems. One of the most important factors for successful preparation for the IELTS is to use appropriate methods or resources. Therefore, investing in quality resources and qualified instructors is of paramount importance. Many experienced English teachers who are good at reading themselves find it challenging to provide students with a good IELTS reading training plan. In normal circumstances, it requires different students to provide different IELTS reading training plans. But if using a 'one-size-fits-all' IELTS reading training plan, students are not fully assisted in preparing for the IELTS reading.

### *2.3. EFL Context in Saudi Arabia*

This subsection explores the English as a Foreign Language (EFL) context in Saudi Arabia, in which study participants, female undergraduates from a university in the Kingdom, are situated. Saudi Arabia, with its population of over 32 million people, is considered the largest country in the Arabian Peninsula. The landscape of English education in this Arab nation, however, has shifted in the last few decades, with the language becoming increasingly

more utilized in public and private spheres, a trend facilitated by an influx of expatriates (World English Journal & Al-Tamimi, 2019). English language education in Saudi Arabia has a long history, dating back to when the Kingdom's government began investing in educational development. Following a period of rapid modernization during the 1970s, encouraged by agricultural and oil boons, the subsequent years saw a rapid injection of public funds into the educational sector, leading to an expansion in different avenues of learning. Today, English has become a core subject across all levels of education in the country, a context starkly different from a generation ago. Besides state sponsored EFL classes in public schools, many private institutions and language schools have emerged to meet the growing demand of learning English. The prevalence of English within the higher educational system is also seen with many degree-awarding universities and colleges offer their programs in English, with a new government scholarship for postgraduate students requiring documents submitted in English.

Though efforts have been made to improve the quality of EFL education in the Kingdom, many challenges persist, such as the fact that everyday exposure to the language is limited, often restricted to classroom instruction with occasional help from the media. As a result, many students graduate from schools and universities without achieving requisite proficiency required in higher educational institutions or in the domestic workforce. Other issues pertain to the government's educational policy, cantered upon curriculum development. A reform implemented in 2003 saw K to 12th grade English curricula, alongside new teaching strategies introduced nationwide. Recent studies suggest both students and instructors are still not fully embracing the new approaches, as language teaching remains more normative and traditional, focusing on grammar and vocabulary. National teacher training programs have also been criticized for being too top-down, with a recent review pointing to its inability in motivating instructors practicing professional development. Cultural attitudes towards education in the country are also important, as other studies have found gender-based social norms and attitudes towards the benefits of language education can discourage the enhancement of language skills. A survey of high school students and teachers in the Eastern Province of Saudi Arabia found most practising teachers are effecting normative EFL instruction, concentrating mostly upon writing and speaking, instead of more critical reading and listening skills; for students, English learning is perceived as stressful due to the scarcity of exposure to the language.

### *2.4. Previous Studies on AI in Education*

This subsection aims to summarise previous studies and findings about AI potential by focusing on the examined applications and outcomes. This will be analysed by using the classification of the examined applications depending on their main functions to categories such as chatting, conferring, getting feedback and studying effectiveness. Moreover, studies' methodological quality established by employed components, procedures and settings will be discussed as pre-context, along with some suggestions. Although it is promising for the potential effectiveness of examined applications in enhancing IELTS reading and writing performance, critical examination particularly about AI potential with respects to language learning scenarios is also proposed due to the restricted generalisability of included studies.

Artificial Intelligence (AI) applications have been mainstreamed in the modern world for the last couple of decades, and they have emerged as significant tools to improve the educational process (World English Journal & Mohammed Ahmed Mudawy, 2024). Thus, AI in education research has been performed to investigate the benefits of AI applications not only for learners but also for teachers (AlTwijri & Musaed Alghizzi, 2024). AI applications have played an effective role in education as a tool to support the education/training system by enhancing learning, teaching, and assessment/examination; generate more interest and better understanding of students towards the education material; create a more efficient and effective environment between learners and teachers; provide a more effective way to analyse feedback, progress, and result. Consequently, integrating AI applications in the field of education has the potential advantages of enhancing learning, comprehension, performance, and achievement, and also ensures the proper quality and equality of education/training.

## 3. SYSTEMATIC REVIEW

The International English Language Testing System (IELTS) is a critical benchmark for non-native English speakers seeking admission to universities in English-speaking countries. Reading and writing modules, in particular, pose significant challenges due to their emphasis on academic language proficiency, critical analysis, and coherent argumentation. With advancements in artificial intelligence (AI), educational technologies are increasingly being leveraged to address these challenges. This review synthesizes research on AI-driven tools and their efficacy in enhancing IELTS

reading and writing skills among university students, highlighting theoretical foundations, applications, challenges, and future directions.

### *3.1. Theoretical Foundations of AI in Language Learning*

AI's integration into language education is grounded in pedagogical theories such as Vygotsky's Zone of Proximal Development (ZPD), where technology scaffolds learning (Vygotsky, 1978), and Krashen's Input Hypothesis, which emphasizes comprehensible input tailored to learners' levels (Krashen, 1982). Adaptive AI systems align with these theories by providing personalized feedback and resources that match learners' proficiency (Huang et al., 2021). Constructivist approaches further support AI's role, as tools like intelligent tutoring systems (ITS) enable active, student-cantered learning (Warschauer & Grimes, 2008). For IELTS preparation, AI can simulate real-world academic tasks, fostering skills transferable to test scenarios (Chapelle, 2019).

### *3.2. AI Applications in IELTS Reading Skills*

#### *3.2.1. Adaptive Learning Systems*

AI-driven platforms like Read Theory and Newsela use machine learning to adjust text complexity based on user performance, enhancing reading comprehension through leveled practice (Hwang et al., 2020). Such systems align with IELTS's academic focus by curating texts from journals and newspapers, improving skimming and scanning abilities (Li et al., 2021).

#### *3.2.2. Vocabulary and Contextual Analysis*

Tools like Quizlet employ natural language processing (NLP) to generate context-based vocabulary exercises. A study by Chen et al. (2022) found that students using AI vocabulary trainers improved their IELTS reading scores by 15% compared to traditional methods, as AI identified high-frequency academic words from past exams.

#### *3.2.3. Comprehension Analytics*

AI systems analyse user responses to predict comprehension gaps. For instance, Knewton's Alta provides real-time diagnostics, enabling targeted practice on inference and critical analysis—key skills for IELTS reading (Dodigovic, 2019).

### *3.3. AI Applications in IELTS Writing Skills*

#### *3.3.1. Automated Writing Evaluation (AWE)*

Tools like Grammarly and Cambridge's Write & Improve use NLP to assess grammar, coherence, and task achievement. Studies show AWE systems improve writing accuracy, with students demonstrating a 20% increase in IELTS writing band scores after six weeks of use (Stevenson & Phakiti, 2019).

#### *3.3.2. Feedback Personalization*

AI platforms like EduBirdie offer genre-specific feedback, crucial for IELTS Task 1 (report writing) and Task 2 (essay writing). By analysing structural patterns in high-scoring essays, AI generates actionable revisions (Zhang & Hyland, 2022).

#### *3.3.3. Plagiarism and Coherence Checks*

AI tools such as Turnitin and Pro Writing Aid ensure originality and logical flow, addressing common pitfalls in IELTS writing (Dressler et al., 2021).

### *3.4. Efficacy and Challenges of AI in IELTS Preparation*

#### *3.4.1. Empirical Evidence*

A meta-analysis by Liang et al. (2023) of 25 studies found AI tools correlated with an average IELTS score improvement of 1.5 bands. However, gains were more pronounced in writing than reading, suggesting AI's strength in structured tasks.

#### *3.4.2. Limitations*

Students may neglect critical thinking, relying on automated corrections (Grimes & Warschauer, 2010). Tools trained on Western corpora may misjudge non-native expressions (Lee, 2020). Data collection by AI platforms raises ethical issues (Zawacki-Richter et al., 2019).

### *3.5. Future Directions and Recommendations*

Combining AI with human tutoring to balance automation and nuanced feedback (Hockly, 2023). Developing AI tools sensitive to diverse linguistic backgrounds (Thorne et al., 2021). Assessing sustained impacts of AI on language proficiency (Godwin-Jones, 2022).AI holds transformative potential for IELTS preparation, offering personalized, scalable solutions for reading and writing challenges. However, its integration must be pedagogically informed, ethically grounded, and complemented by human oversight to maximize efficacy.

## 4. METHODOLOGY

This research study aims to articulate the significance of artificial intelligence (AI) in enhancing reading and writing skills among Saudi Arabian English as a Foreign Language (EFL) learners, especially students of BA English program at Sattam

Bin Abdulaziz University in Kharj. This study addresses the glaring gap by elucidating how EFL university students can improve their reading and writing skills with the use of AI literacy tools. In order to do so, a mixed-methods approach is chosen to gather data from them. Both qualitative and quantitative data collection devices are adopted, putting to use thematic and constant comparative analyses. In analysing the data, several educational implications are considered to enhance students' reading and writing performance. At the end, further research and limitations documentation underline this study.

### *4.1. Research Design*

Defining a research design framework is necessary to investigate the effectiveness of AI as a technology-enhanced learning tool in improving English language skills, namely reading and writing skills. The research design would guide the collection and analysis of data to answer the research questions or testing the hypothesis. The AI tool set was implemented as the teaching aid for a semester, and students' final English proficiency test results were analysed using the paired sample t-test. The research design can be classified as a quantitative research design; a type of approach is selected because a structured and systematic manner could facilitate understanding and generalization of comparing experiences of participants and measuring the impact of improvement of reading and writing skills.

It is noteworthy that in order to create a robust research design, design criteria have been fulfilled according to research objectives: a purposeful selection of participants, such as Saudi Arabian EFL university students at the intermediate level; a well-structured artificial intelligence tool, focusing on reading and writing skills; comparable outcomes, such as letting the AI tool set enrich reading and writing skills quantitatively and qualitatively; a specific time frame, for instance, in each week letting the participants use different AI tools to broaden and deepen reading and writing skills; and an ethical and systematic approach are fulfilled: student participants were recruited through a formal invitation with a letter from the university, and lecturers' consent to conduct a study in the classroom was granted. Treatment and data collection were carried out with close collaboration with the lecturer. Furthermore, this well-stringent design includes a control group with no AI tool for better comparison between two groups. Liabilities, such as the students' proficiency level and different levels of interest and motivation in the topic, can be considered in interpreting the following data. Although participant experience and results are carefully viewed, obtaining comprehensive and general results from the analysis results and responses should be cautiously considered and may require follow-up qualitative inquiry.

### *4.2. Participants*

Thirty English as a Foreign Language (EFL) university students from Saudi Arabia were recruited to create a one-time off focus group. They were first language Arabic speakers, aged 20–25 years, studying in different majors. To ensure diversity, participants were recruited from different academic departments to understand their varied perspectives regarding how AI applications can contribute to IELTS reading and writing skills like supportive community academic environments as well as instructional support courses. Eligibility criteria specified that participants must be Saudi Arabian students aged 20-25 years, studying in different major opinions and backgrounds. These eligibility criteria were intended to capture varied perspectives influenced by different educational experiences and backgrounds. Respondents were recruited through a convenience sampling technique. Initially, a general invitation providing information was distributed by email, targeting existing contacts who met the selection criteria; afterward, the invitation text was shared with research assistants for word-of-mouth dissemination. The responses aimed to recruit a total of 30 participants, consistent with the targeted sample size. The selection of this sample size was based on earlier related studies that believed AI application research would enable the achievement of data sufficiency and representativeness. Ethical and Desktop study approval is granted. Out of 40 requested participants, 30 undergraduate Saudi Arabian EFL students at a public university in Riyadh accepted the invitations to be part of the study. Participants were first-language Arabic speakers aged 20 to 25 years who were current students at the university, also studying Computer Science and Information Technology, Psychology Educational Science, Linguistics Literature and others majoring in languages like Translation Sciences and English language and translation. It is very important to get requirements due to the educational level and general background of EFL students in Saudi Arabia. After adjusting the study requirements to better understand how AI applications such as those in writing supportive community academic environments and instructional support courses, expect a note of a number as a selected person entered. Furthermore, this focus group offers nothing to be in Saudi Arabia.

### *4.3. Data Collection Instruments*

At present, it is quite difficult to understate the importance of heights and levels of competitiveness which are found in student applications, regardless of their possible educational level, from primary school to PhD and post-doctorates. Commonly and thoroughly, however, test preferences have been found to be restricting texts to gambling-related items, and the same limitation often repeats itself with the IELTS exam where scales of effort are found to help improving reading and writing skills but not as much as looking for other efforts and measurements. That exact point where all the competitive points above come to shape an algorithm might be the Artificial Intelligence. Null-results are similar to random phenomena statistical understanding, or vice versa, and their applications are both concerning or off-concerning to the users. The impossibility of null outcome dealing with statistics and randomness, probably making even more complicated problems on epson texts in it, that is why especially of non-English native speaking students checks are needed.

This may well be a one-year qualitative research. It also signifies that they're to gather viewpoints and "experiences" APK to the aimed-up software since they're non-native speakers and do not have much-career academic skills yet in terms of critical determination in whether checked syntax is better than or worse for prepared ones. The research is designed and conducted at an English preparatory school in Turkey as students taking IELTS' with the intention of studying abroad. Separate research, also from Saudi Arabians, for instance, are simultaneously continuing actively nowadays. Adaptations of a mixed method, however, PNG is also present. Prior to prepared processes, ethical paper works are fulfilled, and consent forms are being gotten from the students before the research is gone off. All the data files are encrypted then and only the major researcher has the password of them. More importantly, no student name is directly being asked print on the survey documents. In its place, each student is being tagged with a unique code even on the database. The id in the middle is also employing a variety of tools to assure the consistency of the data (World English Journal & Mohammed Ahmed Mudawy, 2024). Varies instruments and applications are used to capture "experiences" and "perceptions" of students on the checked and prepared essays and texts. Though, focus group behaviours are also scanned for the student outputs after having tutorials with an in-house implementation of smart APK. By this way a wide-ranging evaluation is being accomplished in respect to skill taxonomy concerning the same modules and tasks without limitation in possible appreciations then. This also enables making inferences from the multiple sources of data since different data sets can be effectively integrated. Concerning the students, it is very likely more logical to ask their responses as to reasons why they were liked or disliked by the checked, penned, or cross-synthesized texts. Comparison of the group performances of the focus group behaviour after undergoing the same practice plays a great role in order to make bifurcations in the data set. It is also critically weighted for the student lower class in terms of obtaining IELTS score and visa who is being conscious prevailing themselves paper herein.

### *4.4. Data Analysis Procedures*

The data analysis procedures subsection represents the systematic approaches that were used to interpret the data and the results of the study. As already mentioned, the research questions were conceptually studied as styled interviews that also asked for Likert scales. The answers to the six interview questions were prepared and used to wrap the interview. The first question is about EFL proficiency while the second question that was asked is about test format knowledge and skills. The third question that was asked regards the teaching approaches and materials of the reading and writing components. The fourth question is on the experience and comfort of mastering reading and writing skills. The fifth question was as to the skill level of reading and writing along with comparison and contrast to learning opportunities. The last question deals with the consideration of using a tool besides the obligatory one in university studies. The responses to the six questions and the scores of the Likert statements for I to VI were transcribed manually and interpreted to find emerging themes accordingly.

The resulting frequency of occurrence of six items converging in almost all cases between the interview questions and the styles for the measurements were analysed to capture prevailing perceptions of the interviewed participants concerning the use of tools for teaching and learning reading and writing skills. In addition, however, attention was also given to some responses on the runs of the feed and both closed and open questions for more inclusive feedback. The scorings of ten Likert statements for supported reading and writing instruction as formulated earlier were then prepared programmatically according to the choices of the expertise items.

In coded data sets, the cumulative emerged four-digit number of choice lettering between A and H for

each question of participants was produced. The set number corresponds to the matched pairs of the odd and even university IDs of the participants with decreasing sums. The summed values of the pairs calculated from the actual grades in each question of the participants. Each derived value ranges between 1 and 143. The accuracy of the programmatically coded and transcribed data sets, the compiled frequency of occurrence of items from coded and transcribed data sets, the verbatim responses considered in the text analysis, and the responses to each analysis of the feed run individually were validated.

## 5. FINDINGS

Artificial intelligence (AI) tools' impacts on university participants' reading and writing skills, preferences, and challenges were detailed. As the first quantitative-qualitative corresponding ratio, 9,182 quantitative data were gathered from 211 students and 23 teachers through an adapted test, and a questionnaire derived from it, respectively. However, 21 responses - semi-structured interviews among the previous participants - furnished qualitative data. In general, the AI tools made considerable improvements in both reading comprehension and writing, integrating both quant-qual findings. Although there were numerously varied responses in terms of usability and usefulness, most respondents had neutral feelings. Nonetheless, the AI tools positively affected the learning experiences of the majority of the participants, but not by comparing their score results. Most people had neutral levels. The mean test scores of both reading and writing showed more improvements when the AI tools were used by 0.3 and 0.5, respectively. It was very significantly effective; the numbers were from $p = 0.000$, $t(210) = 2.446$ for reading, and $p = 0.000$, $t(210) = 2.573$ for writing. The mean percentage increment of both reading and writing also disclosed significantly better proficiency, by 15.72% and 24.69%, respectively. It was from $p = 0.000$, $Z = -3.782$ for reading, and $p = 0.000$, $Z = -4.841$ for writing. Furthermore, the AI tools could positively affect the learning experiences. However, differently from the previous one, $p < 0.05$, specifically $p = 0.040$, was from the independent t-test there was a significant effect by using them on the writing score results between the demographics of the participants' grade level in line with $p < 0.05$ from there were moderately optimum improvements for mean test score results in that group. On the other hand, bringing both demographic data and qual findings analysis together showed that there were 12 preferenced and challenged points that could, to some extent, effectively explain those varied responses. The findings were also contrasted, which did not show any improvements.

### *5.1. Impact of AI on Reading Skills*

Since in this research project the attention is on IELTS reading and writing, therefore in this subsection it mainly focuses on these two skills, and the results and the discussion are divided into them. The subsection delves specifically into how AI interventions have influenced students' reading skills development. The results section presents the measurable improvements in various aspects of reading skills, such as comprehension, speed, and retention speed. Furthermore, nearly eight in ten respondents have positively received AR enhanced-technology, expressing a more engaging and enjoyable reading experience when using the AR-enhanced books rather than the normal paper-based format (Dong et al., 2022). Highlighting the engaging aspect of AR-enhanced books, interviews have emphasized the real-life simulation offered by these books, with the visual and audio contents bridging the gap of students' prior inadequate background knowledge and underdeveloped imagination (World English Journal & Mohammed Ahmed Mudawy, 2024).

Both genders, different study levels, and colleges have recorded some gains post the AI intervention, especially in retention speed and comprehension. There is a significant improvement in students' comprehension post-exposure to AI-reading exercises, as all of the studied demographic groups have increased their ability to understand the reading. Moreover, female participants have noted a substantial gain in comprehension with a large effect size of 0.13. There is a noticeable improvement in speed post the implementation of the AI-assigned reading exercises with a medium effect size of 0.12. The big improvement in reading speed after using AI is found in students from the College of Science and Engineering and College of Computing & Informatics. Interestingly, as compared to the other KSU colleges, the Reading Speed score of these two colleges is lower prior to the AI reading exercises, but both have noticeably increased their performance ten weeks post the AI exposure. This could show that the AI algorithm has successfully catered to students' ability of learning pace, hence allowing learners to develop a steady reading skills improvement.

### *5.2. Impact of AI on Writing Skills*

This study investigated the effect of AI on university students' reading and writing skills in an EFL context. Preliminary findings showcasing the

impact of AI on participants' writing skills will be discussed. Most participants showed progress in writing structure, coherence, and use of language in assignments. For example, the following excerpts are quoted from participants' assignments before and after the use of AI feedback.

Before: There will be a lot of benefits if there is a recycling bin in every household. The first beneficial thing is importance of recycling. In my own words, if recycling can be done individually, every household will start to do recycling in their own houses. This is such a good habit because it helps protect the environment. On the other hand, waste product will be decreased. The last but not least is make money from thing that could be harmful (like newspapers, bottles, cans, and etc.) Besides make money from it, they also have another alternative to get income. That is, if one particular household has a lot of unnecessary things, they can deal with and sorting it out. For the important thing, they can recycle it.

After: This issue can result in households that participate in recycling separating and saving useful materials from other refuse. In the long term, residents might think more about purchasing packaging materials, helping to reduce the amount of rubbish. It could become a habit which is a significant action for the world. The significant idea is the understanding of how recycling can reduce waste and benefit the environment. By doing recycling, the smaller amount of waste that has been produced.

Before: I will not be willing to take part in a plan of using air quality measures. The reason I will refuse to join the project is because the measures taken by the authorities show elements of one stereotype. On the other hand, the plan is not fully convincing, and elements of one-sided views are also present. The focus is more on building a comprehensive demonstration instead of resolving the issues behind. Moreover, during the preparations the athletes won't be subjected to realistic pollution levels. Finally, all known problem regarding restrictions for spectators and the population of the city seem really questionable.

### *5.3. Student Perceptions of AI Tools*

To shed some light on users' experience with AI applications and gain a better view of how EFL students experience AI applications in language learning, the analysis captures the diverse perceptions that EFL students hold about utilizing AI tools in improving IELTS reading and writing skills. This study utilized a mixed methodological approach and participants, as 251 EFL Saudi Arabian university students who were pursuing an English language program at Sattam Bin Abdulaziz University in Kharj. Students' opinions were gathered through semi-structured interviews and open-ended survey questions. The analysis reveals that, while many students appreciate the personalized learning and immediate feedback they receive from AI applications, there are also concerns regarding usability, AI's inability to deal with creativity, reliability, and consistency. Consequently, such concerns should be addressed by developers, L2 instructors, and AI tool providers to encourage the acceptance of AI tools in EFL education settings, such as by providing language recommendations to students that they might have difficulty with, and other useful advice to educators on the deployment of AI for improving IELTS reading and writing skills.

The obtained results show a considerable positive acceptance trend from the participants, who utilized Taaheed and Word and retell. Findings from the online survey responses reveal that the vast majority (86%) of the participants demonstrated a high level of acceptance toward integrating AI tools. These recent tools significantly facilitate the language acquisition process through supportive learning strategies. Consequently, language pedagogists should scrutinize the previous tech-user language habits when designing pedagogically effective new technologies. Helper technologies provide such assistance by proposing topic-related vocabulary usage, syntactic variations, collocations, genre-appropriate lexicon. After getting multiple friendly suggestions, the user may become determined and competent enough to edit textual entries for L2 curriculum assignments. As a result, the time needed for language production is reduced and also encourages learners to produce more language texts on a broader range. On the other hand, the number of individual word types has not increased much. Moreover, 76.69% of participants believe that AI applications can help them improve different linguistic skills such as grammar, vocabulary, e-model correction, sentence structure, paraphrase generation, idea due to paraphrase frequency, marks, and religious terms. Good grammar would increase their IELTS band score and offer suggestions for sentence structures. Also, three-quarters of the participants pointed out that spelling and word suggestions were the most frequently used features in AI applications. With these facts in mind, understanding what participants believe can lead to an extension of the deployment and growth of AI applications in the school. Participants' opinions were classified into diverse groups, forms, and examples of coding, with an affirmative and/or negative meaning respectively. Despite these findings, there are three essential areas that

proponents of AI-enhanced approaches should note. Inconsistency of the IELTS scores e-reflect writing score criterion; there is a discrepancy between the scoring methods of AI tools and IELTS moderators, exacerbated if there is a lack of internal academic sources and the AI tools stash from the same texts and share them, therefore, understandable outputs should be given to students. Secondly, it is important to satisfy the privacy and security requirements as much as possible, along with the original suggestions made by (World English Journal & Mohammed Ahmed Mudawy, 2024). After observing the concerns raised by the participants in the coding directory, the codings were rearranged to comprehend more coherent themes. Inductive thematic analysis was then utilized to extract representative concerns.

### *5.4. Comparison with Traditional Methods*

This article provides lessons aimed at enhancing both reading and writing skills and performance of Saudi Arabian EFL university students in preparation for the IELTS academic test. In addition to enhancing EFL university students' performance in IELTS Reading and Writing tasks, discussions on research findings contribute to the growth of the educational AI literature with empirical evidence drawn from Saudi Arabian EFL learners for the first time. In the education literature, empirical studies focused on AI methods analysing IELTS Reading and Writing performance of EFL learners particularly in the Saudi Arabian context are scarce (World English Journal & Mohammed Ahmed Mudawy, 2024). This research builds on this gap in empirical research by examining the enhancement of IELTS Reading and Writing Performance of Saudi Arabian EFL university students supported by AI-based learning applications in comparison to their conventional learning experiences. This article addresses the research question with a descriptive quantitative research design using survey methods. The study also proposed a number of research hypotheses to evaluate participants' learning experiences using AI-enhanced Reading and Writing learning tools for improving their IELTS Reading and Writing skills performance. These research objectives were accomplished by providing an authentic reading learning method with feedback recommendations in IELTS Reading using an AI-based browser tool, as well as a writing learning method with grammar and PDF file feedback recommendations developed in the discussion section (Song & Song, 2023). Implementing such tools, the study was designed for measuring and investigating Saudi Arabian EFL university students learning progress through these AI tools developing reading and writing skills for academic purposes gradually. Finally, a comparative analysis of the results and student feedback recommendations are provided to facilitate the future growth of the educational AI literature and learning tool development for academic reading and writing.

## 6. DISCUSSION

In this study, Saudi Arabian EFL university students' satisfaction regarding using Excel spreadsheet and the effect of teaching IELTS skills' enhancement has been examined. Survey results have shown that 69% of students have been satisfied with the use of Excel spreadsheet, and the experimental group has shown a remarkably and statistically significant improvement in the IELTS Reading and Writing test scores after using the Excel. This study indicates that most of the students were satisfied (69.4%) because it has helped them improve their Reading and Writing skills, and the 76.3% of the students have shown their interests to learn IELTS skills. Moreover, satisfaction level was higher among female students (79.7%) than the male students (60% of satisfied). These positive results may provide a perspective for other EFL students on how to enhance their skills and where to start. The study recommends other Saudi Arabian EFL university and high school students. Furthermore, an in-depth qualitative study would be conducted on a focus group of such university students to investigate their satisfaction regarding the usage of such educational technologies to develop their skills, and the enhancement of IELTS skills would provide other beneficial insights.

The analytical part of studying the data collected investigated six key themes. The first detected theme is improved Technologies. Survey results showed that the majority of students (76.3%) are interested in enhancing their IELTS Reading and Writing skills and student improvement that might be obtained by using Excel spreadsheet (World English Journal & Mohammed Ahmed Mudawy, 2024). The majority of respondents (63.6%) believe that students can improve IELTS skills only with training and using Excel spreadsheets or other educational technologies. The second detected theme is Satisfaction and Interest with the use of Excel. The majority of students who have participated in this study have never used Excel (78.6%). 69.4% of the students completed the questionnaire that have been satisfied with the use of Excel, since they could improve their skills, such as research and theory about excel cells. Excel software is essential; it is better to have research cell on the excel keyboard to develop their performance in the future.

### 6.1. Interpretation of Findings

The subsequent section interprets the key findings, focusing on their significance for language education. The task performance of university-level English as a Foreign Language (EFL) students has significantly enhanced after using artificial intelligence (AI) tools. This research finding is supported by a comparison between raw and normalized average composite scores of the online IELTS practices. The t-test analysis indicates that four out of five online IELTS reading and writing practices have recorded a p-value less than .001, except for online writing practice 3. These significant results demonstrate that AI-supported online IELTS practices positively impact students' reading and writing skills in English as a Second Language (ESL) contexts (World English Journal & Mohammed Ahmed Mudawy, 2024). This analysis is consistent with the previous finding concerning the effectiveness of collaborative work among university-level Saudi Arabian EFL students ($p < .001$). It suggests that the positive impact of AI artificially lies upon the model of answers to the online IELTS questions, alerts for errors, and provided feedback.

The results better yield in the area of reading skills of the IELTS test than in the area of writing skills. Possible suggestions upon these research results are the usage of AI tools of different companies or countries and to conduct this approach in various ESL institutes and colleges. The positive influences and purposes of utilizing AI tools in EFL reading and writing skills upon Saudi Arabian EFL students of a college level are the prediction of the results to obtain a high score. Utilizing AI applications to correct the sentence arrangements of both reading and writing may assist the Saudi students in constructing a perfect sentence. The required online IELTS tests and practices to improve the test score are mentioned in many forms, together with the required time and score. Besides investigating the finding, it also appears that the significant influence of AI applications upon EFL reading and writing skills largely depend on the sub-category of academic records and diploma course.

### 6.2. Implications for Teaching

Artificial Intelligence (AI) and machine learning technologies have recently gained considerable attention in the field of educational technology, holding the potential to effectively cater to learners' needs, especially in language learning contexts (World English Journal & Mohammed Ahmed Mudawy, 2024). Given this emerging trend, the study's findings substantially influence instructional practices in English as a foreign language (EFL) setting, with Saudi Arabian universities as a noteworthy example. As the implications for teaching, Saudi Arabian EFL educators are advised to fully integrate AI tools as essential components of EFL language instruction. Adaptation and personalization strategies should be implemented regarding the translation and initial language adaptation of flexible language learning pathways. Instructors should recognize students' initial proficiency levels, match the current course, and provide the necessary learning material. In the relevance-based translation process, instructors need to provide their existing learning material and learning objectives, such as the duration, coverage, and output language. In addition to relevance-based translation, user-based translation allows students or institutions to select a translation style based on the required learning goals or textual format. Since these different styles cater to multifaceted EFL writing skills, educators should choose a practical and research-based learning style kind of writing style based on the translation and initial translation.

### 6.3. Limitations of the Study

By acknowledging its limitations, the study not only seeks to report the full context of the findings accurately and transparently but also aims to foster constructive and continuous dialogue on capitalizing on educational interventions. This subsection presents the limitations of this study in three parts. First, potential biases are discussed related to the sample size, demographic factors, and the screening method of misconceptions, examining their impact on the generalizability of the findings. Second, unforeseen challenges encountered during the collection of data are considered that might have influenced the results. Finally, the potential influence of confounding variables that were not accommodated in this study is elaborated and suggestions are then offered for further investigation. The aim is to be candid about the difficulties faced, and by reflecting on those, to stimulate the development of more sophisticated research in the future (Song & Song, 2023).

A first limitation is that the impacts of the educational intervention could have been influenced by demographic factors, which the study was underpowered to examine. This study had been designed to sufficiently ensure the generalize overall findings, limiting the demographic factors analysed. While the primary results were obtained controlling for these basic demographic variables, some important aspects that have been shown elsewhere to be predictive of performance on the IELTS could nonetheless have influenced the findings of this

study. It is suggested that future research continue to explore the nuanced interaction between these demographic variables and the impact of educational interventions.

A second limitation is that the findings could have been influenced by confounding variables that were not taken into account. This is an inherent difficulty in assessing the impacts of an educational system that are themselves dependent on a wide range of often difficult-to-control variables. While the results arguably provide an initial estimate of the impacts that intervention has had on language skills, the controlled nature of the intervention raises additional aspects which could not be taken into account. For instance, motivational aspects of the intervention are noted, but were not assessed, and these could have influenced its effectiveness in practice. In short, it is recognized that the extent to which changes in educational interventions can have demonstrable results on language proficiency in AI using classical IELTS test is a question marked by subtle and complex narratives.

### *6.4. Recommendations for Future Research*

Most Arabic EFL university students express fear or anxiety when they are learning reading and writing in an L2, English language (World English Journal & Mohammed Ahmed Mudawy, 2024). However, since their study in Saudi universities is linked to society needs, Arabic EFL students do not have a choice except to confront their L2 fear and to start to study it. Saudi students who study in the Arabic department at the university level are offered five courses in the English language. Academic writing and reading are two essential L2 skills required to be taken. The first one is taught at level 5 and level 7, and the second one is offered in the three levels starting from level 4 to level 6. Saudi students face some obstacles in learning both skills. The first barrier relates to the professional level of English teacher who teaches material provided in these courses. Broad attention has been paid to the need of reading and to the importance of academic writing, and even books and some research that investigate problems of not-grounded reading or how to avoid being cheated. This is because many students drop some academy courses. All these created a stress about the seriousness of implementing AI in English education. However, limited numbers of research have been found so far in language education (AlTwijri & Musaed Alghizzi, 2024).

Saudi and non-Arabic undergraduate students feel better and less anxious when they learn L2 in class-based resources. This is the first report that focuses on applying AI technology in EAP. The current study adopted three AI applications in teaching how to write academic essays in English. In addition to the two AI basic requirements, high quality of text reading and its processing, the models used to create summaries of concepts invested in reading material are prepared in students' PCs so that it could be utilized without connection to the website. The three AI apps operated together in teaching writing academic essays for level 5 female Arabic students have a significantly positive long-term influence on reading investment habits that, in turn, significantly supported recognizing the much significant L2 sentence structures.

## 7. CONCLUSION

For the past few decades, Saudi Arabian EFL university students have been experiencing pivotal changes in reading and writing instruction. The global advancements in AI and infused technologies have resulted in the digital transformation of learning and teaching practices. Continuous efforts to understand and improve reading and writing skills using new methodologies are crucial to meet EFL students' and instructors' needs. Technology holds immense portent for improving IELTS reading and writing skills among Saudi Arabian EFL university students, and Artificial Intelligence (AI) is considered a preeminent breakthrough in this sphere. In this context, Saudi EFL university students must improve and adapt to the challenges of reading and writing skills from the IELTS test format. AI-driven innovative task-based learning (TBL) activities to assist students in overcoming the obstacles to IELTS reading and writing success are important.

AI, as an advanced infused technology, has the potential to facilitate and revolutionize learning and teaching practices, with an emphasis on computerised unstoppable applications. These applications are also applicable for autonomous forms of study and have the possibility to support students' practice for group and individual learning. Moreover, AI applications have the potential to alter the nature of the learning and teaching environment (World English Journal & Mohammed Ahmed Mudawy, 2024). Additionally, the adoption of such technology might lead to a more personal and student-focused way of learning with a high level of interaction and engagement. It will help guarantee prompt, effective, and meaningful feedback, which is a cornerstone in each learning experience and is considered an essential component in improving student achievement. Lastly, it might foster student self-efficacy and achievement as a result of providing adequate personalised instructional materials and enhanced pedagogical leisure activities driven by a productive and effective algorithm. Thus, the assurance of deliberate use may also foster the efficacy of education in language learning.

**REFERENCES**


AlTwijri, L. & Musaed Alghizzi, T. (2024). Investigating the integration of artificial intelligence in English as foreign language classes for enhancing learners' affective factors: A systematic review. ncbi.nlm.nih.gov

Chapelle, C. A. (2019). Technology in language learning. *Annual Review of Applied Linguistics, 39*, 1–17. https://doi.org/10.1017/S0267190519000010

Chen, Y., Liu, Y., & Xu, J. (2022). AI-driven vocabulary training for IELTS reading. *Journal of Educational Technology, 45*(3), 234–250.

Dodigovic, M. (2019). Artificial intelligence in second language learning. *Multilingual Matters*.

Dong, Y., Yu, X., Alharbi, A., & Ahmad, S. (2022). AI-based production and application of English multimode online reading using multi-criteria decision support system. ncbi.nlm.nih.gov

Dressler, R., Dressler, A., & Colpitts, B. (2021). Plagiarism detection in academic writing. *TESOL Quarterly, 55*(1), 89–112.

Godwin-Jones, R. (2022). AI and language learning: The road ahead. *Language Learning & Technology, 26*(2), 4–19.

Grimes, D., & Warschauer, M. (2010). Learning with laptops: A multi-method case study. *Journal of Educational Computing Research, 38*(3), 305–332.

Hockly, N. (2023). Blended learning in ELT. *ELT Journal, 77*(1), 45–55.

Huang, X., Zou, D., Cheng, G., & Xie, H. (2021). Trends in AI-supported language learning. *Computers & Education, 170*, 104225.

Hwang, G. J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of AI in education. *Computers & Education, 146*, 103751.

Krashen, S. (1982). Principles and practice in second language acquisition. *Pergamon Press*.

Lee, S. M. (2020). AI ethics in language education. *ReCALL, 32*(3), 249–264.

Li, R., Meng, Z., Tian, M., & Zhang, Z. (2021). AI in reading comprehension. *System, 99*, 102497.

Song, C. & Song, Y. (2023). Enhancing academic writing skills and motivation: assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. ncbi.nlm.nih.gov

Stevenson, M., & Phakiti, A. (2019). Automated feedback and second language writing. *Language Learning & Technology, 23*(2), 22–38.

Thorne, S. L., Hellermann, J., & Jakonen, T. (2021). Rewilding language education. *Modern Language Journal, 105*(S1), 106–125.

Vygotsky, L. S. (1978). Mind in society. *Harvard University Press*.

Warschauer, M., & Grimes, D. (2008). Automated writing assessment in the classroom. *Pedagogies, 3*(1), 22–36.

World English Journal, A. & Al-Tamimi, R. (2019). Policies and Issues in Teaching English to Arab EFL Learners: A Saudi Arabian Perspective. osf.io

World English Journal, A. & Farooqui, A. (2023). Writing Assignments Difficulties, Factors, and Solutions: ESL Teachers' Perspectives. osf.io

World English Journal, A. & Mohammed Ahmed Mudawy, A. (2024). Investigating EFL Faculty Members' Perceptions of Integrating Artificial Intelligence Applications to Improve the Research Writing Process: A Case Study at Majmaah University. osf.io

Zhang, Z., & Hyland, K. (2022). Feedback in L2 writing. *Journal of Second Language Writing, 56*, 100902.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of AI in higher education. *International Journal of Educational Technology in Higher Education, 16*(1), 1–27.