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Enhancing Malaysian University English Test Reading Skills: Investigating ESL Students' Performance and Perspectives on MUETBot Intervention

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Abstract

The ability to read effectively in English is crucial for ESL students, especially for those preparing for standardized tests like the Malaysian University English Test (MUET). This quasi-experimental study aims to investigate the impact of MUETBot, a chatbot learning tool, on ESL students' reading skills, focusing on MUET preparation. Eighty ESL students from Universiti Pendidikan Sultan Idris, Malaysia, were divided into control and experimental groups. The experimental group used MUETBot after in-class instruction, while the control group practiced with conventional MUET papers. Pre and post MUET reading tests, along with semi-structured interviews, were used for assessment. The findings based on the achievement in pre and post MUET reading tests revealed that there was a significant difference $t(39)=.000$, $p < .05$ in the MUET reading skills of students involved in the MUETBot intervention. Student responses from the interview indicated a positive attitude toward MUETBot, emphasizing its convenience and effectiveness in practicing MUET reading skills. This implies that MUETBot is a valuable supplementary tool in ESL education, offering personalized and interactive learning experiences. Future research could explore MUETBot's effectiveness across different language skills and its long-term impact on language proficiency, advancing language learning tools in ESL instruction.

Keywords: Malaysian University English Test, Language Chatbot, ESL Education, MUET Reading Skills, MUETBot

Introduction

In a contemporary educational landscape characterized by rapid technological advancements, the teaching and learning of English have become integral components of Malaysia's vision for a globally competitive and interconnected society (Ahmad et al., 2019). Taghizadeh and Hasani (2020) posited that the integration of innovative approaches is imperative to enhance language learning experiences, especially within the realm of English as a Second Language (ESL) instruction. This study examines the Malaysian University English Test (MUET) reading skills, a cornerstone in assessing English language proficiency among students in Malaysia. In light of this context, this study pivots around the incorporation of

MUETBot, a cutting-edge chatbot learning tool, designed to serve as a supplementary resource for ESL students.

The teaching and learning of English in Malaysia have experienced transformative shifts. These changes reflect the nation's commitment to equipping its people with language skills that go beyond national borders (Goh & Abdul-Wahab, 2020). According to Getie (2020), English proficiency is acknowledged as a key asset that enables worldwide connection and provides access to diverse opportunities. However, within the nuanced landscape of ESL education, the MUET reading skills component poses distinct challenges (Harun et al., 2021; Pudin et al., 2020; Yin & Hanif, 2024). ESL learners often grapple with complexities in comprehending, analyzing, and interpreting English texts, necessitating a nuanced exploration of the specific impediments faced by students (Gazu & Mncwango, 2020; Singh et al., 2021; Song et al., 2020).

At the intersection of language instruction and technological innovation, this study introduces MUETBot as an avant-garde solution to enhance ESL learning experiences (Yin & Hanif, 2024). The integration of chatbot technology in language instruction represents a shift from conventional teaching methods, providing students with an engaging and tailored learning environment. MUETBot emerges as a dynamic tool designed to augment conventional teaching methods, providing ESL learners with targeted support in honing their MUET reading skills (Yin & Hanif, 2024). By delving into the multifaceted landscape of education technology, specifically the integration of chatbots, this research seeks to elucidate the potential impact on ESL students' performance and perceptions in the context of MUET reading skills. This study contributes to the ongoing discussion on improving English language education in Malaysia by examining the challenges and possibilities that arise when integrating language instruction with technology. The research seeks to address two research questions as follows

1. Is there a significant difference in the ESL students' performance towards the use of MUETBot in supporting the learning of MUET reading skills?
2. What are the ESL students' views on the use of MUETBot in supporting the learning of MUET reading skills?

Literature Review

The integration of technology in language learning has been a central focus in educational research, offering the potential to revolutionize conventional methods of instruction and improve the learning process. Scholars such as Shadiev and Yang (2020) have extensively explored the potential of incorporating technology to revolutionize language instruction. Chatbots, as a form of Artificial Intelligence (AI), have particularly gained attention for offering dynamic and interactive platforms conducive to language learning. Belda-Medina and Calvo-Ferrer (2022) assert that chatbots, as a subset of AI, present unique opportunities for language learners to engage with language content in innovative ways. This literature establishes the broader context for the exploration of MUETBot, a chatbot designed to augment traditional learning methods and provide a conducive environment for ESL students.

In the realm of English language learning, the use of chatbots has garnered significant attention as a promising technological tool. Belda-Medina and Calvo-Ferrer (2022) highlight the dynamic and interactive nature of chatbots, emphasizing their potential to engage

language learners effectively. The adaptability of technology-enhanced language learning is a recurring theme in existing literature (Rane et al., 2023; Wang et al., 2023). Chatbots, such as MUETBot, represent a departure from conventional teaching methods, aiming to create immersive and tailored learning experiences. Research by Rane et al (2023); Wang et al (2023) recognizes the capacity of technology-enhanced learning to cater to individual needs, further underlining the relevance of chatbots in the evolving landscape of English language education.

MUETBot, developed by Tang and Hafiz (2024), is a notable addition to the landscape of technology-mediated language learning. Specifically designed to support the learning of MUET reading skills, MUETBot integrates advanced language technologies with pedagogical insights to create an interactive and personalized learning experience. This development addresses the specific needs of ESL students preparing for the MUET reading exam, aligning with the broader trend of incorporating technology to enhance language proficiency. The unique features of MUETBot, such as instant feedback, interactive exercises, and personalized learning paths, position it as a valuable tool in the arsenal of language learning resources.

To comprehensively underpin the research on MUETBot, this study leverages the ELTC framework, recognizing key educational, linguistic, technological, and communicative theories (Yin & Hanif, 2024). Lev Vygotsky's Social Constructivist Theory, embedded in the education theory, emphasizes active learning and interaction, providing the theoretical foundation for understanding the collaborative nature of MUETBot in ESL instruction. Krashen's Second Language Acquisition theory informs the language perspective, exploring how MUETBot contributes to language proficiency within the context of MUET reading skills. The technological aspect draws on Bower's Technology-Mediated Learning Theory and Siemens's Connectivism Theory, investigating how MUETBot aligns with contemporary educational technology principles. Social Presence Theory, embedded in the communicative theory, is incorporated to understand how MUETBot fosters meaningful interactions and community in online language learning environments. Together, these theories provide a robust framework for examining the impact and effectiveness of MUETBot in enhancing ESL students' language skills.

Methodology

This quasi-experimental study involves 80 ESL students from Universiti Pendidikan Sultan Idris, Malaysia, with an equal distribution into a control group (conventional learning) and an experimental group (chatbot learning). The treatment group engages with MUETBot after in-class instruction, while the control group practices with conventional MUET papers, ensuring a clear demarcation of the interventions. To maintain the integrity of the study, stringent measures are implemented, prohibiting information exchange between the two groups. Both groups are taught the same topic using conventional learning pedagogy in the control group. All participants are required to fulfill their designated tasks – chatbot learning for the treatment group and conventional MUET paper practice for the control group – ensuring the prescribed interventions are adhered to. The teacher overseeing the study ensures a strict separation of information between the two groups, mitigating any potential contamination of results.

For quantitative assessments, pre and post MUET reading tests, derived from the established "EXCEL in MUET" published by Penerbit Ilmu Bakti Sdn. Bhd in 2023, serve as standardized measures. The pre-MUET reading test provides a baseline for participants' reading skills proficiency, offering a snapshot before any intervention. The post-MUET reading test, conducted after exposure to four chatbot interventions, mirrors the pre-MUET in structure, question types, and difficulty levels. Both tests consist of 7 parts and 40 questions, ensuring consistency and reliability in evaluating participants' reading skills. The quantitative data collected will be analyzed using the Statistical Package for Social Sciences (SPSS), allowing for a robust statistical examination of the impact of chatbot interventions on MUET reading skills.

Complementing the quantitative approach, a qualitative dimension is introduced through semi-structured interviews with ten randomly selected ESL students from the experimental group. The interviews aim to delve into participants' perceptions and experiences concerning the use of MUETBot, covering initial impressions, challenges faced in MUET reading preparation, observed benefits, user interactions, preferences, identified limitations, comparisons to traditional study methods, personal strategies, and perceived impacts on motivation and engagement. The qualitative data will be analyzed thematically, providing a nuanced understanding of the subjective impact of MUETBot on students' learning journeys. Through this mixed-methods approach, the study aims to offer a comprehensive understanding of the impact and nuances of MUETBot in enhancing MUET reading skills for ESL students.

Results and Discussions

The analysis of the pre-test mean scores for the control group and the experimental group reveals that, before any intervention, the experimental group had a slightly higher mean score (64.69%) compared to the control group (62.38%) (*Table 1.0*). However, an independent sample t-test indicated that this difference was not statistically significant (P > .05), suggesting that both groups were at the same proficiency level in terms of MUET reading skills before the intervention (*Table 2.0*).

Table 1.0

The MUET Reading Test Mean Scores in Pre-Test

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Control	40	62.38	7.002	1.107
	Experimental	40	64.69	8.829	1.396

Table 2.0

The Independent Samples T-Test Results on the MUET Reading Test Mean Scores in Pre-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Pre_Test_Scores	Equal variances assumed	2.323	.131	-1.298	78	.198	-2.31250	1.78162	-5.85944	1.23444
	Equal variances not assumed			-1.298	74.152	.198	-2.31250	1.78162	-5.86234	1.23734

Moving to the post-test, the experimental group demonstrated a substantial improvement with a mean score of 68.81%, while the control group showed a modest increase to 63.88% (*Table 3.0*). An independent sample t-test revealed a significant difference (P < .05) between the groups in the post-test (*Table 4.0*). This implies that the chatbot intervention had a discernible impact, resulting in statistically different MUET reading skills between the control and experimental groups after the intervention.

Table 3.0
The MUET Reading *Test Mean Scores in Post-Test*

	Group	N	Mean	Std. Deviation	Std. Error Mean
Post-test	Control	40	63.88	6.379	1.009
	Experimental	40	68.81	7.637	1.208

Table 4.0
The Independent Samples T-Test Results on the MUET Reading Skills Mean Scores in Post-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Post_Test_Scores	Equal variances assumed	.730	.395	-3.138	78	.002	-4.93750	1.57336	-8.06982	-1.80518
	Equal variances not assumed			-3.138	75.601	.002	-4.93750	1.57336	-8.07139	-1.80361

Further analysis was conducted within each group, exploring the changes from pre-test to post-test. The paired samples t-test for the control group indicated a significant improvement (p < 0.05) (*Table 5.0*). This suggests that the conventional teaching method employed in the control group led to a statistically significant enhancement in MUET reading skills. Similarly, the paired samples t-test for the experimental group showed a significant improvement (p < 0.05) (*Table 6.0*). However, the mean difference in the experimental group (4.12) was substantially higher than that in the control group (1.5), indicating a more substantial improvement in the experimental group.

Table 5.0
Paired Samples T-Test Scores of Pre-Tests and Post-Tests of the Control Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Controlled_Pre_Test_Scores - Controlled_Post_Test_Scores	-1.50000	3.38738	.53559	-2.58334	-.41666	-2.801	39	.008

Table 6.0
Paired Samples T-Test Scores of Pre-Tests and Post-Tests of the Experimental Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 2	Experimental_Pre_Test_Scores - Experimental_Post_Test_Scores	-4.12500	4.68734	.74113	-5.62408	-2.62592	-5.566	39	.000

In conclusion, the findings suggest that while both conventional teaching and chatbot interventions led to significant improvements in MUET reading skills, the use of chatbot was more effective. The experimental group, exposed to chatbot learning, demonstrated a higher mean difference, indicating a more pronounced enhancement. This outcome aligns with the overarching trend in educational technology literature, emphasizing the potential of technology-enhanced learning methods in improving language skills. The triangulation of these quantitative results with insights from semi-structured interviews further strengthens the credibility of the study, offering a comprehensive understanding of the impact of MUETBot on ESL students' reading skills.

The second research question aimed to explore ESL students' perspectives on the use of MUETBot in supporting the learning of MUET reading skills. The analysis of students' views revealed several themes, providing a comprehensive understanding of their experiences with MUETBot.

a. Student Motivation and Engagement in Using MUETBot

Students identified the immediacy of feedback as a key motivator, creating a sense of progress and sustaining engagement. MUETBot's interactive nature transformed the learning experience, making MUET preparation more engaging and dynamic. The role of MUETBot in fostering collaboration and its alignment with Social Presence Theory were emphasized, indicating that computer-mediated communication positively impacted learners' motivation and engagement. The chatbot's feedback was perceived as more than instructional, serving as a valuable source of social interaction. MUETBot's influence on confidence was highlighted, contributing to a positive feedback loop that enhanced overall engagement.

b. Benefits of MUETBot in Assisting MUET Reading Skills

Students recognized various benefits of using MUETBot, particularly in vocabulary enhancement. The integration of MUETBot with Google Docs and ChatGPT provided an effective and seamless learning experience, aiding in the acquisition of a richer and more diverse vocabulary. Convenience emerged as a recurring theme, with students praising MUETBot for addressing issues such as reading speed and providing flexible, time-efficient learning options. The tool's ability to offer diverse topics, customization features, and diverse learning resources were acknowledged as significant advantages, contributing to practical skill enhancement. MUETBot's interactive approach, including practice exercises, comprehensive notes, and educational videos, provided a dynamic and immersive learning experience.

c. Comparison between MUETBot and Traditional Methods

Students highlighted several advantages of MUETBot over traditional methods. MUETBot's convenience, user-friendly interface, adaptability to individual learning paces, immediate feedback, and its role as a comprehensive and interactive study companion were emphasized. The tool's dynamic and responsive learning experience was contrasted with potentially delayed feedback in traditional methods.

d. The Influence of MUETBot on Learning Outcomes

MUETBot demonstrated a positive impact on various learning outcomes. Students reported vocabulary enhancement through instant definitions and contextual information. Timed practice exercises significantly contributed to improving reading speed, and targeted and efficient practice addressed specific weaknesses. The tool's influence on critical thinking and comprehension skills was evident through instant feedback and explanations for correct answers, fostering a deeper understanding of content. MUETBot positively impacted focus and concentration during reading tasks, contributing to sustained performance during examinations. Personalized learning experiences, facilitated by MUETBot's user-friendly interface and recommendations, were commended for enhancing engagement, retention, and understanding.

e. Students' Suggestions and Recommendations for Enhancement of MUETBot

Students provided valuable suggestions for enhancing MUETBot, including broadening its focus, incorporating audio features for pronunciation guidance, increasing flexibility in customizing practice exercises, providing more detailed explanations for correct answers, supporting collaborative learning through group study options, enriching vocabulary support with synonyms and antonyms, and refining the naturalness of interactions.

The findings from the analysis of ESL students' perspectives on the use of MUETBot in supporting the learning of MUET reading skills align with existing literature on technology-enhanced language learning. The positive impact of MUETBot on student motivation and engagement resonates with studies emphasizing the motivational benefits of incorporating technology into language education (Shadiev & Yang, 2020). The immediacy of feedback and the interactive nature of MUETBot contribute to creating a dynamic and engaging learning environment, aligning with the principles of active learning advocated by Lev Vygotsky's Social Constructivist Theory (Yin & Hanif, 2024). The emphasis on collaboration and the positive influence on learners' confidence are indicative of the social presence facilitated by MUETBot, aligning with the findings of research highlighting the importance of meaningful interaction in language learning (Belda-Medina & Calvo-Ferrer, 2022).

Additionally, the identified benefits of MUETBot in assisting MUET reading skills, such as vocabulary enhancement, convenience, and practical skill enhancement, are consistent with the broader literature on the advantages of technology-mediated language learning. Studies have highlighted the effectiveness of chatbots and similar AI-driven tools in vocabulary acquisition and providing tailored learning experiences (Rane et al., 2023; Wang et al., 2023). The seamless integration of MUETBot with platforms like Google Docs and ChatGPT reflects the adaptability of technology in addressing specific language learning needs, aligning with the principles of technology-mediated learning theories (Bower, 2016; Siemens, 2005). The positive influence on critical thinking and comprehension skills is in line with research emphasizing the role of technology in fostering analytical thinking and deeper understanding (Shadiev & Yang, 2020).

In conclusion, the findings underscore the significance of incorporating tools like MUETBot in language education, aligning with established theories and literature on technology-enhanced language learning. The positive outcomes, including increased motivation, enhanced vocabulary, and improved critical thinking skills, reinforce the potential of such AI-driven platforms in supporting ESL students' learning of MUET reading skills. The identified suggestions for enhancement, such as broadening the tool's focus and incorporating audio features, provide valuable insights for future developments to further optimize the effectiveness of MUETBot in language education.

Conclusion

In conclusion, this quasi-experimental study delved into the effectiveness of MUETBot in enhancing MUET reading skills among ESL students at Universiti Pendidikan Sultan Idris, Malaysia. The findings revealed that MUETBot significantly influenced students' motivation and engagement through immediate feedback, interactive learning experiences, and a positive feedback loop that boosted confidence. Moreover, the tool demonstrated substantial benefits in assisting MUET reading skills, particularly in vocabulary enhancement, convenience, and providing targeted and efficient practice. The comparison with traditional methods highlighted MUETBot's advantages in terms of flexibility, user-friendliness, and a comprehensive, interactive study approach. Importantly, MUETBot positively influenced various learning outcomes, including critical thinking, comprehension skills, and personalized learning experiences.

The implications of this study are significant for both educators and educational technology developers. MUETBot's positive impact on motivation, engagement, and learning outcomes suggests its potential as a valuable supplementary tool in ESL classrooms. Educators can consider integrating MUETBot into their teaching methodologies to enhance students' reading skills. Additionally, educational technology developers can draw insights from students' positive experiences to refine and improve chatbot functionalities for language learning, catering to diverse learner needs.

While this study provides valuable insights, there are avenues for further research. Future studies could explore the effectiveness of MUETBot across different language skills, such as speaking and writing, to offer a more comprehensive language learning experience. Investigating the long-term impact of MUETBot on students' language proficiency and retention could provide a deeper understanding of its sustained effectiveness. Furthermore, exploring the potential integration of additional features, such as audio-guided pronunciation practice or collaborative learning tools, could enhance the tool's versatility. Additionally, longitudinal studies assessing MUETBot's impact on a larger and more diverse sample of ESL students could contribute to the generalizability of the findings. Overall, continuous research in this domain can guide the development of advanced language learning technologies that cater to the evolving needs of ESL students.

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