



KEMENTERIAN PENDIDIKAN TINGGI

PITRAM 2026

Pertandingan Inovasi Antara Asasi Malaysia

Extended Abstract Book



11 dan 12 APRIL 2026

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MAJLIS DEKAN/PENGARAH ASASI
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MASSTer: An AI-Assisted MUET Speaking Simulation Trainer for Enhancing Task Fulfilment and Interactive Communication

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ABSTRACT

MASSTer (MUET AI SpeakSim Trainer) is an AI-assisted pedagogical innovation designed to enhance students' performance in the Malaysian University English Test (MUET) speaking component. Although MUET is aligned with the Common European Framework of Reference (CEFR), many pre-university students face challenges in fulfilling task requirements, generating relevant ideas, and participating effectively in group discussions. These issues are largely due to limited opportunities for structured speaking practice, lack of immediate feedback, and absence of realistic simulation environments. This innovation aims to develop a structured, rubric-aligned AI training system that supports both individual speaking tasks and group discussion simulations. MASSTer is developed using a design-based approach and operates through two modes: Practice Mode, which provides guided prompts and iterative feedback to support idea development, and Full Simulation Mode, which replicates real MUET test conditions without intervention. The system utilises AI-driven analysis aligned with MUET assessment criteria. A pilot implementation involving 180 students indicated positive outcomes, with 73.6% reporting improved confidence and preparedness. The system also recorded high levels of user acceptance, demonstrating its effectiveness in enhancing task fulfilment, discourse management, and interactive communication skills. In conclusion, MASSTer provides a scalable and cost-effective solution for MUET speaking preparation. It demonstrates strong potential for commercialisation through application development, institutional integration, and wider adoption in English language education.

Keywords: MUET, AI-assisted learning, speaking skills, CEFR, language assessment

1. INTRODUCTION

The Malaysian University English Test (MUET) is a standardised English proficiency examination used to assess students' readiness for higher education in Malaysia. Despite alignment with the Common European Framework of Reference (CEFR), a gap remains in cognitive and communicative demands, particularly in speaking tasks requiring idea development and interaction.

Many students transitioning from SPM to MUET face difficulties in organising responses, generating ideas, and participating in discussions due to language anxiety, limited vocabulary, and insufficient opportunities for meaningful speaking practice (Du et al., 2026). Although artificial intelligence (AI) tools are increasingly used in language learning, studies have shown that AI-based chatbot systems can enhance speaking performance through real-time feedback and adaptive practice; however, many existing tools still provide generic feedback that is not aligned with specific assessment frameworks such as MUET (Ji, 2026).

Therefore, this study aims to design and evaluate MASSTer (MUET AI SpeakSim Trainer), an AI-assisted simulation system to improve task fulfilment, idea development, and interactive communication among MUET candidates.

2. METHODOLOGY

This study is guided by the research question: *How can an AI-assisted simulation system improve students' performance in MUET speaking in terms of task fulfilment, idea development, and interactive communication?* This question addresses key challenges in second language learning while responding to practical MUET preparation needs.

MASSTer is developed using a design-based research (DBR) approach, involving iterative design, implementation, and evaluation cycles. This approach allows continuous refinement of the system based on user feedback while ensuring alignment with pedagogical objectives (Huang & Li, 2023).

2.1 Research Framework

MASSTer is informed by the Output Hypothesis, which emphasises language production in learning (Swain, 2005), and social constructivist theory, which highlights learning through interaction (Vygotsky, 1978). These theories support the use of guided practice and simulated interaction.

2.2 System Design and Implementation

MASSTer is an AI-based system aligned with MUET speaking criteria, focusing on task fulfilment, discourse management, and language use. It operates through two modes:

2.2.1 Practice Mode

This mode provides guided prompts to support idea development through iterative feedback.

2.2.2 Full Simulation Mode

This mode replicates MUET speaking conditions, allowing independent task completion followed by structured feedback.

To enhance realism, MASSTer incorporates role-based AI agents representing Candidates B, C, and D, enabling turn-taking, idea exchange, and interaction.

2.3 System Workflow

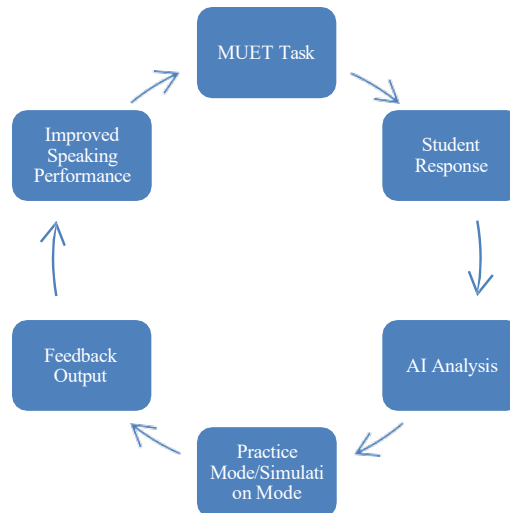


Figure 1. MASSTer System Workflow

As illustrated in Figure 1, MASSTer processes student input through an AI analysis engine before generating feedback based on the selected mode.

2.4 Data Collection and Evaluation

A pilot study involving 180 pre-university students was conducted. Data were collected using Technology Acceptance Model (TAM) measures, including perceived usefulness (PU), perceived ease of use (PEOU), attitude (ATT), and behavioural intention (BI), to evaluate system effectiveness and usability.

3. RESULTS AND DISCUSSION

The findings indicate strong acceptance and effectiveness of MASSTer. A total of 73.6% of students reported positive responses. The mean score for perceived usefulness (PU) was 4.08, while perceived ease of use (PEOU) recorded 4.00. Attitude (ATT) and behavioural intention (BI) recorded 3.87 and 3.78 respectively, indicating overall positive perception.

Table 1. MASSTer Pilot Study Results

Variable	Description	Mean Score
Sample Size	Pre-university students	n = 180
Perceived Usefulness (PU)	Usefulness of MASSTer	4.08
Perceived Ease of Use (PEOU)	Ease of use	4.00
Behavioural Intention (BI)	Willingness to use MASSTer	3.78
Positive Feedback (%)	Students reporting improvement	73.6%

The results show that MASSTer enhances task fulfilment, idea development, and interaction. Practice Mode supports idea generation, while Simulation Mode improves confidence in real test conditions.

These findings align with the Output Hypothesis (Swain, 2005) and social constructivist theory (Vygotsky, 1978), highlighting the role of production and interaction in language learning. AI-driven feedback further supports personalised learning and improved engagement (Fathi & Rahimi, 2024)

4. CONCLUSION

MASSTer demonstrates strong potential as an AI-assisted tool for improving MUET speaking performance. Findings indicate high user acceptance and improved confidence, particularly in task fulfilment and interaction. Future research should evaluate long-term impact and integrate features such as speech recognition and adaptive learning. MASSTer also shows strong commercial potential as a scalable application that can be integrated into learning platforms and adopted by institutions and language centres.

ACKNOWLEDGEMENT

The authors would like to express their sincere appreciation to Universiti Malaysia Sarawak (UNIMAS) for the support provided throughout this study. The authors also extend their gratitude to all participating students for their valuable contribution and feedback during the implementation of MASSTer.

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