

Developing AI-Integrated Speaking Assessment via Yoodli for Vocational Tourism Students: A Borg and Gall Study

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ABSTRACT

This study addressed the lack of contextualized, efficient, and objective speaking assessments oriented toward sustainable tourism. At SMK Negeri 1 Medan, speaking activities were not sufficiently oriented toward sustainable tourism, while conventional teacher-led assessment was constrained by limited time, potential scoring subjectivity, and delayed individualized feedback. Therefore, this study aimed to develop and evaluate an AI-integrated speaking assessment using the Yoodli platform for vocational tourism students in Medan. Employing a Research and Development design adapted from the Borg and Gall model, the study involved needs analysis, product development, expert validation, and limited implementation with two English teachers and 60 Grade X–XI students. Data were collected through interviews, questionnaires, and validation instruments. Needs analysis revealed students' difficulties in vocabulary, grammar, pronunciation, fluency, and confidence, while teachers reported time-consuming assessment and limited feedback. The developed assessment incorporated sustainable tourism tasks supported by Yoodli's automated feedback. Expert validation yielded an overall score of 93.33% (highly valid), with content validity 95.25%, construct validity 95.00%, and practicality 90.25%. Student perceptions were highly positive (mean = 4.4/5). The findings indicate that the assessment is valid, usable, and contextually relevant for supporting speaking practice, immediate feedback, and independent learning in vocational tourism education.

Keywords: *AI-Integrated Assessment, Speaking, Sustainable Tourism, Vocational Education, Yoodli*

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INTRODUCTION

North Sumatra is one of Indonesia's prominent tourism destinations, recognized for its rich natural and cultural attractions, such as Lake Toba, coastal areas, and diverse local cultural heritage. The development of tourism in this region has increasingly emphasized the concept of sustainable tourism, which seeks to balance economic growth, environmental preservation, and socio-cultural sustainability (Indonesia, 2021; Organization, 2018). This direction requires the support of qualified human resources who are not only competent in technical tourism skills but also capable of communicating effectively in international contexts while promoting sustainability values.

In line with this demand, vocational students in the tourism sector, particularly those at SMK Negeri 1 Medan, are expected to possess English-speaking skills that are not only communicative but also contextual and professionally relevant. Speaking is the most frequently used language skill in tourism workplaces, where graduates serve as front-line staff who interact with international tourists, provide information about destinations, and deliver customer service (Saragih, 2022; Thongphut & Kaur, 2023). These skills include the ability to explain tourism destinations such as Lake Toba, Bukit Lawang, and Berastagi, offer accurate and engaging information, and promote local tourism potential responsibly (G. Richards & Wilson, 2007). Thus, speaking competence in this context goes beyond linguistic ability and extends to the integration of content knowledge and professional communication skills.

As global tourism trends continue to shift toward sustainability, speaking competence must also reflect the integration of sustainability values. Students are expected to

communicate ideas related to environmental conservation, cultural preservation, and community well-being within their spoken interactions (G. Richards & Wilson, 2007). Sustainable tourism is an appropriate context for speaking assessment because it requires learners to use English for specific purposes (ESP) in authentic, real-world tasks, such as explaining sustainable practices, promoting responsible travel, and addressing tourists' concerns about environmental and cultural impacts (UNWTO, 2018). This is essential because vocational tourism graduates often serve as frontline representatives who shape tourists' experiences and perceptions, making their communicative competence a key factor in delivering responsible and educational tourism services (Thongphut & Kaur, 2023).

However, current speaking instruction and assessment practices in vocational schools, including SMK Negeri 1 Medan, remain largely general and lack contextual integration with tourism and sustainability. Learning activities are still dominated by general English conversations, with limited emphasis on professional tourism contexts. Moreover, existing assessment instruments are not specifically designed to measure students' ability to explain local tourism destinations or articulate sustainable tourism practices (Brown & Abeywickrama, 2010). This indicates a gap between the competencies required in the tourism industry and the actual implementation of teaching and assessment in schools.

It is important to distinguish between teaching speaking and assessing speaking. While teaching focuses on providing opportunities for practice and developing fluency, assessment determines the extent to which students have achieved specific speaking competencies and provides evidence for decision-making about learning progress (Brown, 2004; Luoma, 2004). In vocational tourism education, effective speaking assessment should measure not only linguistic accuracy but also the ability to perform tourism-related communicative tasks in realistic contexts.

In addition, conventional speaking assessments face several practical challenges. Previous studies have documented that teacher-led speaking assessments are time-consuming, prone to subjectivity in scoring, and often provide limited and delayed feedback for students (Brown & Abeywickrama, 2010; Luoma, 2004). These limitations reduce the effectiveness of assessment as an integral part of the learning process, particularly in supporting the development of students' professional competencies in tourism. Furthermore, students in vocational tourism programs frequently report difficulties in vocabulary, grammar, pronunciation, fluency, and confidence when speaking English, which are consistent with findings in other ESP and tourism contexts (Prachanant, 2012; Saragih, 2022).

The advancement of Artificial Intelligence (AI) offers a promising solution to these challenges. AI-based technologies enable more objective, efficient, and scalable speaking assessments through automated analysis of fluency, pronunciation, and speech clarity (Chapelle, 2020; Viberg et al., 2020). One such platform is Yoodli, which provides immediate and structured feedback to users, allowing learners to reflect on and improve their speaking performance independently (Inc., 2023). Yoodli was selected for this study because, unlike many AI pronunciation tools that focus primarily on segmental accuracy, it offers holistic feedback on speaking pace, filler words, clarity, confidence, and organization, and supports iterative practice through recording, feedback, and revision cycles. These features align well with the principles of formative assessment and self-regulated learning in ESP contexts (Holmes et al., 2019; Viberg et al., 2020).

The integration of Yoodli into English language learning for tourism students presents an opportunity to develop more relevant and contextualized speaking assessments. By designing speaking tasks that incorporate themes of sustainable tourism in North Sumatra, assessment can function not only as a tool for measuring language proficiency but also as a medium for internalizing environmental awareness and professional responsibility. However, studies that specifically focus on developing AI-integrated speaking assessment using Yoodli within the context of sustainable tourism education in North Sumatra remain limited, particularly at the vocational education level.

This study aimed to address several key aspects: (1) analyzing the needs for AI-integrated speaking assessment that align with the characteristics of vocational tourism

students in Medan; (2) developing an AI-integrated speaking assessment through the Yoodli platform that is oriented toward sustainable tourism in North Sumatra; and (3) evaluating the feasibility of the developed assessment in terms of content validity, construct validity, and usability.

Accordingly, the results of this study were presented in three main stages: (1) needs analysis, which identifies students' characteristics and assessment requirements; (2) development and implementation of the AI-integrated speaking assessment using the Yoodli platform; and (3) evaluation of the developed assessment, including feasibility aspects and students' perceptions after implementation. Through these stages, this research was expected to bridge the gap between current educational practices and the demands of the tourism industry, while enhancing the quality, objectivity, and effectiveness of speaking assessment through the integration of emerging AI technologies.

METHOD

Research Design

This study employed a Research and Development (R&D) design adapted from the Borg and Gall model. The Borg and Gall model consists of ten systematic stages: (1) research and information collecting, (2) planning, (3) develop preliminary form of product, (4) preliminary field testing, (5) main product revision, (6) main field testing, (7) operational product revision, (8) operational field testing, (9) final product revision, and (10) dissemination and implementation (Borg et al., 2007). In the present study, seven stages were implemented and adapted to the vocational tourism context: (1) needs analysis (research and information collecting), (2) product design (planning), (3) product development (develop preliminary form of product), (4) expert validation (preliminary field testing), (5) product revision (main product revision), (6) limited trial (main field testing), and (7) final analysis and refinement (operational product revision). The final three stages of the original model (operational field testing, final product revision, and dissemination) were not included in this paper because the current report focuses on the development and initial validation of the assessment instrument.

Research Participants

The study was conducted at SMK Negeri 1 Medan, a public vocational high school with a tourism department in Medan, North Sumatra. The participants comprised two English teachers and 60 students from Grades X and XI of the Tourism Department. The teachers were selected using total population sampling, as these two individuals are the sole English teachers within the Tourism Department. The 60 students were selected using purposive sampling based on the following inclusion criteria: (a) enrolled in Grade X or XI of the Tourism Department, (b) currently taking English subjects, and (c) willing to participate in the needs analysis and limited trial. All participants had basic digital literacy and access to smartphones or computers for using the Yoodli platform.

Research Instruments

Two main instruments were used in this study: a semi-structured interview guide for teachers and a student questionnaire for needs analysis.

Teacher Interview Guide

The interview guide was developed by the researchers based on the Borg and Gall needs-analysis stage and previous studies on speaking assessment in vocational tourism (Brown & Abeywickrama, 2010; Luoma, 2004). It consisted of 12 open-ended questions organized into four dimensions: (a) current speaking instruction and assessment practices, (b) challenges in assessing speaking (e.g., time, subjectivity, feedback), (c) perceptions of students' speaking difficulties (vocabulary, grammar, pronunciation, fluency, confidence), and (d) expectations for AI-integrated speaking assessment. The interview guide was reviewed by two experts in English language teaching and one expert in vocational tourism education to ensure content validity. Minor revisions were made to improve clarity and alignment with the research objectives.

The questionnaire was developed by the researchers to identify students' needs, preferences, and difficulties in English speaking and assessment. It comprised 26 items measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), along with three optional short-answer questions. The Likert-scale items were organized into five dimensions: (a) perception and confidence with 5 items, (b) tourism contextual needs with 7 items, (c) linguistic difficulties with 5 items, (d) assessment model preferences with 6 items, and (e) technology and AI readiness with 3 items. Additionally, the three short-answer items were included to identify the students' greatest speaking difficulties, the specific topics they wanted to study further, and their overall expectations for speaking instruction. The questionnaire was adapted from instruments used in previous needs-analysis studies in ESP and vocational tourism contexts (Prachanant, 2012; Saragih, 2022) and then contextualized for sustainable tourism.

Data Collection

Data were collected in two phases. First, semi-structured interviews were conducted with the two English teachers in a quiet room at the school, lasting approximately 25 minutes each. The interviews were audio-recorded with participants' permission and later transcribed verbatim for analysis. Second, the student questionnaire was distributed online via Google Forms. Instructions were provided directly within the form, and students completed the questionnaire within 15 - 20 minutes. All data collection procedures were approved by the school principal and conducted in accordance with ethical guidelines for research involving human participants.

Data Analysis

Interview data were analyzed qualitatively using thematic analysis. The transcripts were read repeatedly, coded, and categorized into themes related to assessment needs, challenges, and expectations. The themes were then interpreted in relation to the Borg and Gall needs-analysis stage and existing literature on speaking assessment in vocational tourism. Questionnaire data were analyzed descriptively using mean scores and standard deviations to determine the level of students' needs and priorities in AI-based speaking assessment. Mean scores were interpreted using the following criteria: 1.00–2.49 = low, 2.50–3.49 = moderate, 3.50–4.49 = high, and 4.50–5.00 = very high.

Research Procedure and Product Development

The research followed a series of R&D stages adapted from Borg and Gall, namely (1) Needs analysis: this stage involved collecting data from teachers and students to identify students' characteristics, speaking difficulties, current assessment practices, and requirements for an AI-integrated speaking assessment in the context of sustainable tourism; (2) Product design: Based on the needs analysis, speaking tasks, indicators, and scoring rubrics were designed. The assessment included three main task types adapted from the instructional module: (a) a destination introduction (2 minutes), where students describe Lake Toba as a sustainable tourism destination, outlining its attractions and environmental challenges; (b) a problem-solution speech (3 minutes), where students identify sustainability issues, specifically focusing on wildlife protection in Bukit Lawang, and propose solutions; and (c) a sustainable tourism campaign presentation (4 to 5 minutes), where students promote responsible tourism practices and cultural preservation, drawing on contexts like Samosir Island. Each task was aligned with sustainable tourism themes (environmental conservation, cultural preservation, community well-being), integrated with ESP principles, and designed to be recorded and evaluated using the Yoodli platform Product development. A prototype of the AI-integrated speaking assessment was developed using the Yoodli platform. Instructions, task prompts, and scoring rubrics were integrated into a structured speaking module. Students were instructed to record their responses using Yoodli, review automated feedback on fluency, pronunciation, filler words, and clarity, and revise their performance before final

submission; (3) Expert validation: the prototype was evaluated by four experts (two material experts in English language assessment and two media experts in educational technology) using a validation instrument that assessed content validity, construct validity, and usability. Experts rated each aspect on a 4-point scale (1 = not valid to 4 = highly valid), and percentages were calculated to determine the overall validity category; (4) Product revision: based on expert feedback, the assessment tasks, rubrics, and Yoodli integration were revised to improve clarity, alignment with sustainable tourism competencies, and user-friendliness; (5) Limited trial: the revised assessment was implemented with the 60 students in Grades X and XI. Students completed the speaking tasks using Yoodli, and their perceptions of usability, feedback quality, and learning experience were collected through a post-implementation questionnaire; (6) Final analysis and refinement: data from the limited trial were analyzed to refine the assessment instrument and produce a feasible, valid, and practical AI-integrated speaking assessment for vocational tourism students.

Each stage was designed to ensure that the developed assessment is valid, practical, and aligned with the needs of vocational tourism students, particularly in supporting sustainable tourism competencies.

FINDINGS AND DISCUSSION

Findings

This study aimed to address several key aspects: (1) analyzing the needs for AI-integrated speaking assessment that align with the characteristics of vocational tourism students in Medan; (2) developing an AI-integrated speaking assessment through the Yoodli platform that is oriented toward sustainable tourism in North Sumatra; and (3) evaluating the feasibility of the developed assessment in terms of content validity, construct validity, and practicality.

Accordingly, the results of this study are presented in three main stages: (1) needs analysis, which identifies students' characteristics and assessment requirements; (2) development and implementation of the AI-integrated speaking assessment using the Yoodli platform; and (3) evaluation of the developed assessment, including feasibility aspects and students' perceptions after implementation. Through these stages, this research is expected to bridge the gap between current educational practices and the demands of the tourism industry, while enhancing the quality, objectivity, and effectiveness of speaking assessment through the integration of emerging AI technologies.

The Needs For AI-Based English-Speaking Assessment Teachers' Perspective (Interview Results)

To explore the needs for an AI-based English-speaking assessment that aligns with the characteristics of vocational tourism students in Medan, semi-structured interviews were conducted with English teachers. This stage aims to identify current teaching practices, challenges in assessing speaking skills, and teachers' perceptions toward the integration of technology, particularly artificial intelligence, in the assessment process. The findings from these interviews provide an in-depth understanding of existing gaps between current assessment practices and the expected competencies in the tourism sector. Furthermore, this analysis highlights the extent to which speaking assessments have incorporated tourism contexts and the potential for AI to enhance efficiency, feedback quality, and learning outcomes. The summary of the interview results is presented in Table 1 below.

Table 1. Interview Results

Aspect	Findings	Interpretation
Teacher Profile	2 English teachers (2–5 years' experience)	Adaptive to new technology
Teaching Methods	Role-play, dialogue, presentation, video	Communicative but conventional
Students' Problems	Vocabulary, grammar, pronunciation, confidence	Lack of language mastery
Assessment Practice	Task-based, rubric-based	Still manual
Constraints	Time-consuming, limited feedback	Inefficient assessment
Digital Readiness	~70% ready	Potential for AI integration
AI Perception	Positive	Strong acceptance
Tourism Integration	Partial	Needs contextualization
Target Skills	Communication in tourism context	ESP needed
Ideal Assessment	Holistic & contextual	Learning-oriented
Expected Features	Automatic feedback	AI is suitable

Based on table 1 above, it showed that the findings from the interviews with the two English teachers at SMK Negeri 1 Medan reveal several important insights regarding their perspectives on current practices and assessment challenges. Both teachers (possessing two to five years of teaching experience) demonstrated an adaptive attitude toward new technologies, providing a positive foundation for AI implementation. Their specific perspectives are reported below:

Perspectives on Current Teaching and Assessment Practices

In terms of methodology, the teachers reported utilizing communicative approaches, including role-play, dialogue, presentations, and video-based activities. While aligned with communicative language teaching principles, the teachers view these methods as conventional because they still rely heavily on teacher-centered evaluation. Both teachers noted that despite using interactive activities, their assessment practices remain entirely manual, relying on task-based assignments and rubric-based scoring. Furthermore, they identified that students persistently struggle with limited vocabulary, weak grammatical competence, inaccurate pronunciation, and low confidence, suggesting a lack of language mastery that requires continuous, structured guidance.

Perspectives on Assessment Challenges (Time, Subjectivity, and Feedback)

When discussing the constraints of their current assessment models, both teachers (100%) emphasized severe inefficiencies. They reported that evaluating students' speaking performance manually is highly time-consuming, creating a significant bottleneck in their teaching workflow. Additionally, relying solely on manual rubrics introduces the challenge of subjectivity in grading, making it difficult to maintain consistent scoring across all students. Because of these time constraints and manual processes, both interviewees confirmed that they are unable to provide detailed, individualized feedback. Consequently, the feedback students receive is often limited and delayed, which the teachers acknowledged reduces its effectiveness in supporting learning progress.

Perspectives on AI Integration and Digital Readiness

The teachers expressed a highly positive perspective on integrating AI into the assessment process. They estimated that approximately 70% of their students possess the digital readiness required to engage with technological learning tools. From the teachers' viewpoint, AI-based assessment platforms (such as Yoodli) are highly suitable solutions because they directly address their primary constraints by offering automated, objective, and immediate feedback.

Perspectives on Tourism Contextualization

Finally, the interviews revealed that the current integration of tourism contexts into speaking activities is only partial. Both teachers emphasized the need for an ideal assessment system that is holistic, learning-oriented, and highly contextualized for the tourism sector. They agreed that shifting toward a more targeted English for Specific Purposes (ESP) model,

supported by AI technology, is necessary to bridge the gap between classroom assessments and the communicative skills required in the tourism industry.

Overall, teachers emphasized the need for an ideal assessment system that is holistic, contextual, and learning-oriented, supported by technological features such as automated feedback. This finding suggests that AI-based assessment, such as through the Yoodli platform, has strong potential to address existing challenges.

Students' Perspective (Questionnaire Results)

To complement the data obtained from teachers, a questionnaire was distributed to students in the tourism department to explore their perceptions of English-speaking learning and assessment. This stage aims to identify students' difficulties, learning experiences, and expectations regarding speaking activities, particularly in relation to the use of technology in assessment. The questionnaire results provide important insights into the extent to which current practices meet students' needs, as well as the challenges they face in developing their speaking skills. Additionally, this analysis highlights students' readiness and interest in AI-based learning and assessment, especially in terms of interactive features and immediate feedback. The summary of the questionnaire results is presented in Table 2 below.

Table 2. Questionnaire Results Summary

Aspect	Findings	Interpretation
Speaking Difficulty	High	Speaking is challenging
Main Problems	Vocabulary, grammar, confidence	Consistent with teachers
Confidence	Low	Students lack confidence
Practice	Limited	Lack of exposure
Feedback	Delayed	Ineffective learning
Learning Media	Traditional	Not engaging
AI Interest	High	Ready for innovation
Tourism Context	Rare	Lack of relevance
Preference	Interactive learning	Need technology
Expected Features	Instant feedback	AI needed

The questionnaire results presented in Table 2 provides a comprehensive overview of students' perceptions regarding English speaking learning and assessment. Overall, the findings indicate that speaking remains one of the most challenging skills for students. A majority of respondents reported high levels of difficulty, particularly in terms of limited vocabulary mastery, inadequate grammatical control, and low self-confidence when expressing ideas orally. These findings are consistent with the teachers' perspectives, confirming that students' linguistic limitations significantly affect their speaking performance.

In addition, students reported low levels of confidence, which further hinder their willingness to participate in speaking activities. This issue is closely related to the limited opportunities for practice both inside and outside the classroom. The lack of regular exposure to speaking tasks results in minimal language production, preventing students from developing fluency and accuracy. Furthermore, the feedback provided in current learning practices is often delayed and insufficient, making it difficult for students to identify and correct their mistakes in a timely manner. As a result, the learning process becomes less effective and does not optimally support students' progress.

Another important finding is related to the learning media used in the classroom. Students perceived that the existing media are still traditional and less engaging, which reduces their motivation to actively participate in speaking activities. In contrast, students expressed a strong interest in the integration of technology, particularly AI-based tools, in learning. This is reflected in their high level of interest in AI-supported assessment systems that can provide instant feedback, interactive features, and a more engaging learning experience.

Moreover, the results reveal that speaking activities are rarely contextualized within tourism-related situations, even though students are enrolled in the tourism department. This lack of contextual relevance limits students' ability to develop communication skills that are

directly applicable to real-world tourism settings. Therefore, students expressed a preference for interactive and context-based learning approaches that integrate tourism scenarios.

Based on these findings, it can be concluded that students not only face significant challenges in speaking but also require a more innovative, engaging, and supportive assessment system. The strong demand for instant feedback, increased practice opportunities, and interactive learning environments highlights the urgent need for the integration of AI in speaking assessment. Such an approach is expected to address existing limitations and better align learning practices with students' needs and the demands of the tourism industry.

The findings from the students' questionnaire clearly reinforce the issues identified in the teachers' interviews. Both data sources consistently highlight students' difficulties in speaking, particularly in terms of vocabulary, grammar, and confidence, as well as the limitations of current assessment practices, including delayed feedback and lack of engaging learning media. While students expressed a strong interest in AI-based and interactive learning, teachers also showed positive perceptions toward the integration of technology to support more efficient and effective assessment.

Given these converging findings, it is essential to integrate both perspectives to obtain a more comprehensive understanding of the actual needs in speaking assessment. By combining insights from teachers and students, the analysis can identify key gaps between current practices and expected competencies, particularly in relation to tourism-based communication and technology integration. Therefore, an integrated needs analysis is conducted to synthesize these findings and formulate the specific requirements for an AI-based speaking assessment model. The results of this integrated analysis are presented in Table 3 below.

Table 3. Needs Analysis of Teachers' Interview and Students' Questionnaire

Category	Identified Problems	Required Needs
Language & Fluency	Weak vocabulary, fluency, grammar, and pronunciation	Continuous, detailed feedback and structured practice
Confidence	High anxiety; fear of making mistakes; low self-confidence	A safe, non-threatening practice environment
Assessment	Time-consuming manual evaluation	Automated systems incorporating role-play and video recording
Feedback	Limited and delayed	Instant, data-driven, and continuous feedback
Context	Generic; lacks specific tourism application	Real-world ESP tasks (e.g., guest service, destination promotion)
Technology	Underutilized AI despite facility readiness	Guided AI integration for interactive learning
Engagement	Traditional methods lack practical motivation	Interactive, dynamic learning via simulations and role-play

The Integrated Needs Analysis presented in Table 3 synthesizes the findings to provide a comprehensive understanding of the current condition of English-speaking instruction in the tourism department. This analysis reveals several critical gaps, reported systematically below, that must be addressed to improve assessment effectiveness.

Linguistic Challenges (Vocabulary, Grammar, Pronunciation, and Fluency)

From a linguistic perspective, both teachers and students consistently identified specific deficits that hinder communicative competence. The student questionnaire data revealed that all aspects of speaking are currently at a low-to-medium level, with specific struggles in vocabulary (mean = 3.00) and fluency (mean = 3.00). Grammar and pronunciation were also noted as persistent weaknesses. Furthermore, students frequently reported experiencing mental blocks, stating they "often do not know what to say" during speaking tasks (mean = 3.16). These quantitative findings were strongly corroborated by the teacher interviews, confirming that these combined limitations require an assessment model that provides continuous, detailed feedback to build linguistic mastery.

Psychological Barriers (Confidence and Anxiety)

In addition to linguistic hurdles, the findings indicate a severe lack of student confidence. The data demonstrates that the primary problem is psychological; students experience high anxiety, specifically feeling nervous when their speaking is evaluated (mean = 3.55). Overall speaking confidence remains low (mean = 3.04), and students generally participate rarely in class (mean = 2.86). Open-ended responses confirmed these barriers, with students explicitly mentioning feeling "gugup" (nervous) and "takut salah" (afraid of making mistakes). Consequently, an assessment system must foster a safe, non-threatening atmosphere that builds confidence before formal evaluation occurs.

Assessment and Feedback Inefficiencies

Regarding assessment practices, current speaking evaluations remain entirely manual. While pedagogically valid, this approach limits teachers' capacity to provide the continuous, detailed feedback that students need. The students themselves indicated a preference for practical, performance-based assessments, showing interest in video recording (mean = 3.18) and guest service simulations (mean = 3.13). This underscores the urgent need for a system that combines role-play methodologies with automated video analysis to generate instant, objective feedback so students can immediately correct their weaknesses.

Contextualization and Technological Integration

The analysis indicates a profound need for targeted English for Specific Purposes (ESP) materials. Students overwhelmingly recognize that English speaking skills are mandatory for their future careers (mean = 4.34). They expressed a strong need for assessment materials that match the real working world (mean = 3.81), specifically requesting topics like "promoting tourist destinations" and "guest service". Technologically, students are accustomed to using devices (mean = 3.37) and possess the necessary facilities. They also showed a willingness to practice using AI (mean = 3.45), though their initial intrinsic interest in AI remains moderate (mean = 2.93). This indicates a highly receptive environment for an AI-integrated assessment system, provided there is sufficient initial guidance to help them adapt to the technology.

Student Engagement and Motivation

Finally, in terms of engagement, traditional learning media are perceived as less effective in motivating students. The students' expectations center heavily on active engagement; their open-ended responses reveal that their primary goals are to become more fluent, confident, and capable of real communication with tourists. To achieve this, students indicated a strong preference for interactive and practical learning experiences over traditional theory, specifically favoring role-play and simulations (mean = 3.13). Technology-based assessment systems, particularly those incorporating AI, are expected to enhance student engagement by meeting these demands for interactive, dynamic, and realistic practice.

Overall, the needs analysis directly shaped the development of the AI-integrated assessment product in this R&D study. Specific challenges identified by teachers and students were mapped directly to the Yoodli platform's features and the module's content. For instance, students' struggles with pronunciation, grammar, and fluency influenced the design of speaking activities that utilize Yoodli's automated metrics to track clarity, pace, and filler words. The need for instant, meaningful feedback to alleviate teacher workloads was addressed by making Yoodli's immediate AI feedback a core component of the students' self-reflection process. Additionally, the urgent need for real-world tourism contexts led to the development of specialized task scenarios, such as promoting sustainable tourism campaigns in North Sumatra. Ultimately, this needs-driven approach ensures the assessment system is highly contextualized, efficient, and capable of addressing specific linguistic and confidence barriers.

Developing an AI-Integrated Speaking Assessment

Based on the results of the needs analysis, an AI-integrated speaking assessment was implemented using the Yoodli platform as a technological solution to address the identified gaps in speaking instruction. The implementation primarily focused on providing automated speaking feedback, enhancing students' speaking practice, integrating tourism-based speaking tasks, and supporting independent learning.

The development stage focuses on the development of an AI-integrated speaking assessment designed to address the needs identified in the previous analysis. The assessment was developed in the form of a structured speaking module that integrates artificial intelligence through the Yoodli platform. The development emphasizes three key aspects: (1) contextualized learning content, (2) AI-assisted performance analysis, and (3) reflective learning through feedback.

The module is organized into several instructional units that integrate English speaking practice with sustainable tourism topics relevant to North Sumatra. The content covers environmental, cultural, and economic perspectives of sustainable tourism, enabling students to engage in meaningful and context-based communication tasks. This approach aligns with the principles of English for Specific Purposes (ESP), which emphasize the importance of contextualized and profession-oriented language learning (Harmer, 2007; J. C. Richards, 2006).

As illustrated in Figure 1, the module design presents a structured and thematic organization that supports both language development and domain-specific knowledge. The module can be accessed online. Students are required to perform various speaking activities, such as destination introduction, problem-solution speeches, and tourism campaign presentations. These tasks are specifically designed to simulate real-world communication in the tourism industry, thereby enhancing students' communicative competence in authentic contexts.



Figure 1. AI-Integrated Speaking Module Using Yoodli Platform

In addition to content development, the assessment integrates the Yoodli platform as an AI-powered speaking evaluation tool. Yoodli functions as a virtual speaking coach that provides automated feedback on students' oral performance. The platform analyzes several aspects of speaking, including speaking pace, filler words, clarity, confidence, and, when enabled, body language. This allows students to receive objective and data-driven feedback without relying solely on teacher evaluation.

To facilitate the implementation of the AI-integrated speaking assessment, systematic procedures for accessing and utilizing the Yoodli platform were incorporated into the developed module. Students can access Yoodli through an internet browser by visiting the official website (<https://www.yoodli.ai>). The platform is accessible through a web-based interface, allowing students to engage in speaking practice, record their performances, and obtain automated feedback. The utilization process generally involves selecting or creating a

speaking task, recording the speech using the platform, and reviewing the performance analysis generated by the system.

To ensure readers understand how the assessment operates in practice, the student interaction with the product follows a specific, four-step cyclical workflow. Systematic procedures for accessing and utilizing the Yoodli platform (<https://www.yoodli.ai>) are explicitly incorporated into the module instructions.

Contextual Preparation (Task Assignment)

Students begin by interacting with the module document. For example, in Unit III, students read about the environmental challenges at Lake Toba. They are then given a specific speaking prompt (e.g., a 2-minute destination introduction simulating a tour guide briefing). Students prepare their arguments, utilizing the provided vocabulary and structural guidelines.

AI-Assisted Recording

Once prepared, students open the Yoodli platform on their internet browser (via HP or laptop). They select a recording session, face their camera, and deliver their speech directly into the platform. This simulates a real-world, face-to-face presentation while allowing students to practice independently without the pressure of an immediate live audience.

Automated Feedback Analysis

Immediately after recording, Yoodli functions as a virtual speaking coach. The platform's dashboard presents the student with objective, data-driven metrics. Rather than relying solely on subjective teacher evaluation, the student visually interacts with a dashboard that highlights: (1) Speaking Pace: Measured in words per minute; (2) Filler Words: Explicit counts of hesitations (e.g., "um," "uh," "like"); (3) Delivery Metrics: Assessments of clarity, vocal confidence, and (when the camera is enabled) body language and eye contact.

A detailed illustration of the procedural steps for accessing and utilizing Yoodli within this assessment is presented in Figure 2.

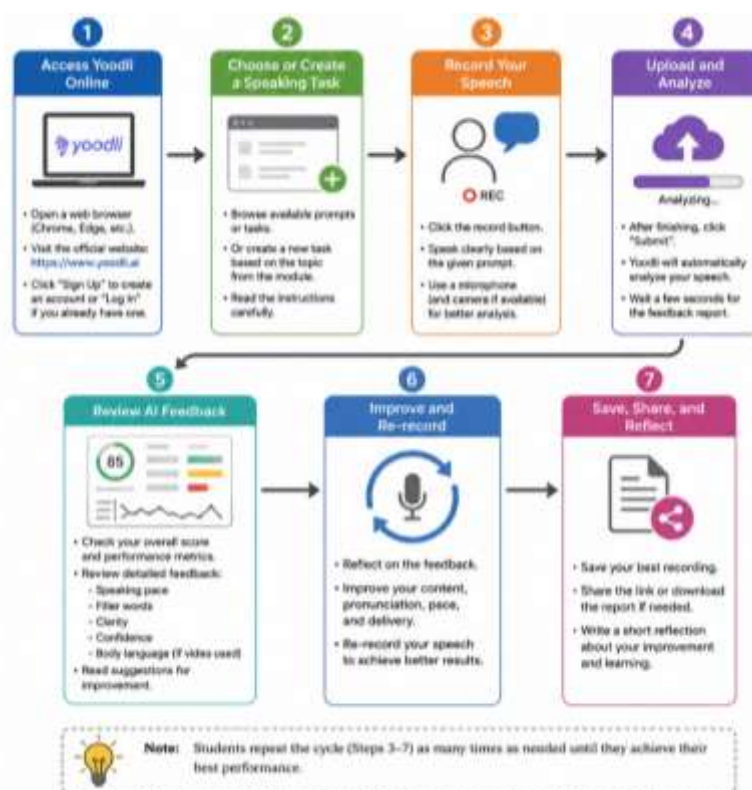


Figure 2. Yoodli Usage Process in the AI- Integrated Speaking Assessment

The use of Yoodli in this assessment follows a structured and iterative process that supports students' speaking development. Initially, students prepare their speaking task based on the given topic, particularly within the context of sustainable tourism. They then record their performance using the Yoodli platform, after which the system automatically generates detailed feedback on various aspects of their speech. This feedback includes strengths, areas for improvement, and specific suggestions for enhancing clarity, organization, and delivery.

Reflection and Iteration

Based on the dashboard results, students complete the "Reflection Sheet" provided in their module. They record their filler word count, speaking speed, strengths, and target areas for improvement. Crucially, the assessment requires students to use this automated feedback to revise their speech and re-record it in Yoodli to achieve a better score. An example of Yoodli's feedback output, illustrating a student's performance analysis in a sustainable tourism speaking task, is presented in Figure 3.

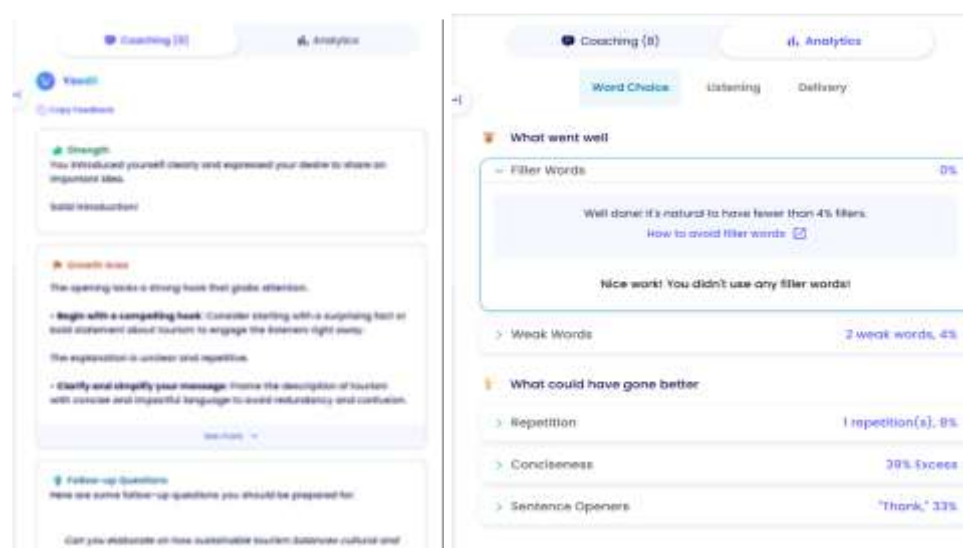


Figure 3. Illustrating Students' Performance Analysis

Furthermore, the integration of AI supports more efficient and scalable assessment practices. Unlike traditional assessment methods, which are often time-consuming and limited in feedback, Yoodli provides instant and consistent evaluation. This directly addresses the constraints identified in the needs analysis, particularly in terms of delayed feedback and manual assessment.

Overall, the developed AI-integrated speaking assessment combines pedagogical relevance with technological innovation. By embedding Yoodli into a contextualized speaking module, this study provides a practical solution that enhances students' speaking skills, increases engagement, and improves the effectiveness of assessment in vocational tourism education.

Evaluating AI-Integrated Speaking Assessment Validity of the Developed Assessment

To evaluate the feasibility and academic rigor of the developed AI-integrated speaking assessment, validation was conducted by four expert validators (two material experts and two media experts). The evaluation was systematically categorized into three core dimensions: Content Validity, Construct Validity, and Practicality. The empirical data from the experts validation are summarized in the table 4 below:

Table 4. Expert Validation Results Based on Evaluation Aspects

Validation Aspect	Evaluation Indicators (from Expert Rubric)	Total Score	Percentage (%)	Adjective Criteria
Content Aspect	Content Feasibility	49 / 50	98.00%	Highly Valid
	Language & Readability	37 / 40	92.50%	Highly Valid
	Aspect Average		95.25%	Highly Valid
Construct Aspect	Presentation Quality	28 / 30	93.33%	Highly Valid
	Instructional Execution	29 / 30	96.67%	Highly Valid
	Aspect Average		95.00%	Highly Valid
Practicality Aspect	Software Utilization	37 / 40	92.50%	Highly Valid
	Visual & Interface Design	44 / 50	88.00%	Highly Valid
	Aspect Average		90.25%	Highly Valid
	OVERALL	224 / 240	93.33%	Highly Valid
	VALIDITY AVERAGE			

The cumulative calculation shows a solid overall average of 93.33%, placing the developed assessment instrument firmly within the "Highly Valid" category.

Content Validity

The content aspect focuses on the extent to which the oral communication tasks within the instrument adequately represent the targeted learning objectives and domain competencies (Brown, 2004). Based on the evaluation by the material experts, the content aspect achieved the highest average percentage of 95.25%.

In detail, the Content Feasibility indicator reached an exceptional 98.00%, demonstrating that the developed speaking tasks are precisely aligned with the vocational curriculum and the principles of sustainable tourism. Concurrently, the Language and Readability indicator obtained 92.50%, confirming that the instructional syntax and linguistic difficulty levels are perfectly calibrated to the cognitive capabilities of vocational tourism students in Medan.

The targeted integration of sustainable tourism themes mirrors real-world workplace communication needs, which serves as a core principle of Communicative Language Teaching (Harmer, 2007; J. C. Richards, 2006). Furthermore, it directly supports national and global strategic priorities in contemporary tourism education (Indonesia, 2021; Organization, 2018).

Construct Validity

The construct aspect measures how accurately the instrument operationalizes and evaluates the underlying theoretical construct it intends to assess—in this case, the students' speaking proficiency (Luoma, 2004). The construct aspect secured a high average percentage of 95.00%.

This strong performance is supported by the indicators for Instructional Execution at 96.67% and Presentation Quality at 93.33%. This robust construct validity proves that the assessment workflow successfully captures the multi-dimensional facets of speaking skills, including fluency, pronunciation clarity, and structural coherence.

The utilization of the Yoodli platform reinforces this construct validity by providing objective, instant analytical feedback on metrics such as speech rate and filler-word frequency. The media experts' evaluation confirms that incorporating these AI features aligns with modern approaches to computer-assisted language assessment, which utilize technology to achieve more detailed, granular, and objective measurements (Chapelle, 2020; Holmes et al., 2019). Additionally, the embedded iterative assessment process allows students to record, reflect on automated diagnostics, and revise their performance, successfully operationalizing the principles of dynamic and formative assessment over time (Viberg et al., 2020).

Practicality

The usability aspect evaluated the practicality, ease of use, and technical functionality of the instrument when deployed by the target users in a real educational environment (Brown & Abeywickrama, 2010). The usability aspect achieved an average percentage of 90.25%.

The Software Utilization indicator achieved a score of 92.50%, signifying that the Yoodli platform is highly adaptive, reliable, and functional as an automated independent speaking assessment medium. Although the Visual & Interface Design indicator received the lowest individual score at 88.00%, it still remains securely within the highly valid range. The constructive feedback regarding the interface design served as a valuable reference for minor technical revisions, such as simplifying the visual layout and user guidelines for the Yoodli links, to enhance the overall student user experience.

The strong usability metrics demonstrate that the instrument is not merely a theoretical construct, but a highly practical, efficient, and viable tool ready for integration into the digital ecosystem of vocational education.

Students' Perceptions

The results of students' perceptions toward the implementation of the AI-integrated speaking assessment using the Yoodli platform are presented in Table 5.

Table 5. Students' Perceptions of the Implementation of the AI-Integrated Speaking Assessment Using the Yoodli Platform

Aspect	Mean Score	Category	Interpretation
Ease of Use	4.53	Very High	Very easy to use
Instructions	4.00	High	Clear guidance
Features	4.06	High	User-friendly
Technical Issues	3.94	High	Manageable problems
Interface	4.00	High	Easy navigation
Speaking Improvement	3.82	High	Improves ability
Feedback	3.71	High	Helpful
Fluency	4.24	Very High	Strongly improves fluency
Pronunciation	3.82	High	Improves accuracy
Independent Learning	4.12	High	Supports autonomy
Engagement	3.88	High	Interesting learning
Motivation	4.29	Very High	Highly increases motivation
Enjoyment	4.18	High	More enjoyable
Confidence	3.76	High	Builds confidence
Participation	3.71	High	Encourages activity
Tourism Relevance	3.82	High	Contextual learning
Assessment System	3.94	High	Effective
Feedback Clarity	4.12	High	Clear
Objectivity	4.12	High	Fair
Progress Tracking	3.65	High	Monitors improvement
Overall Quality	4.18	High	Improves learning

The findings from both the quantitative and qualitative data indicate that students have highly positive perceptions of the use of Yoodli as an AI-integrated speaking assessment tool. All assessed aspects fall within the high to very high categories, demonstrating strong agreement among students regarding the usability, effectiveness, and overall quality of the platform.

In terms of usability, students perceive Yoodli as highly accessible. The highest-rated aspect across the entire survey was "Ease of Use" (mean = 4.53, Very High). Instructions, features, and interface navigation were also rated firmly in the High category (means ranging from 4.00 to 4.06). The score for navigating technical issues was slightly lower but still High (3.94). This aligns directly with the qualitative responses, where some students noted minor difficulties such as device lag, full memory, and temporary confusion with the interface. Despite these minor hurdles, the platform proved practical for classroom implementation.

Regarding speaking development, the quantitative results show that Yoodli strongly contributes to motivation (mean = 4.29, Very High) and fluency (mean = 4.24, Very High).

Pronunciation improvement, overall speaking improvement, and confidence all registered High scores. These findings are strongly reinforced by the qualitative data, where students explicitly emphasized that the platform acts as an objective "AI Speech Coach," helping them smooth out their public speaking and correct their mistakes privately.

Furthermore, the integration of tourism-based speaking tasks was perceived as relevant and meaningful (mean = 3.82, High). This contextualization, combined with the technology, enhances student engagement. The quantitative scores reflect high enjoyment (mean = 4.18) and a strong sense that the tool supports independent learning outside the classroom (mean = 4.12).

In terms of assessment quality, students rated the system as highly effective. Feedback clarity (mean = 4.12) and objectivity (mean = 4.12) were rated highly, meaning students trusted the AI's evaluations. While tracking long-term progress scored slightly lower (mean = 3.65), it remained in the High category, indicating the dashboard successfully helped students monitor their improvement.

Overall, the assessment achieved a High overall quality rating (mean = 4.18). The qualitative data highlights the platform's distinct advantages in providing objective feedback and improving fluency. Students' constructive suggestions for further development – such as adding interactive chat features, simplifying the language, and explicitly modeling correct pronunciation – indicate a highly positive attitude and a clear willingness to continue using the platform in the future. To further explore students' experiences, the qualitative findings are presented in Table 6.

Table 6. Students' Responses of the Implementation of the AI-Integrated Speaking Assessment Using the Yoodli Platform

Category	Findings	Interpretation
Advantages	Students noted it improves public speaking fluency and pronunciation, acts as a private "AI Speech Coach," and provides objective, direct corrections.	AI is highly beneficial and effective for building confidence through independent, targeted practice.
Difficulties	Students reported minor technical issues (device lag, full memory), camera anxiety, and minor confusion navigating sharing features or English-only interfaces.	The platform is mostly reliable, but clear onboarding and device preparation are needed to reduce technical friction.
Suggestions	Students suggested adding interactive chat features, providing exact examples of correct pronunciation, simplifying the interface language, and expanding the platform's use.	High student engagement with a strong desire for more conversational AI features and explicit modeling.

The data provided in Table 6 demonstrates the assessment's validity across usability, usefulness, motivation, content relevance, and assessment effectiveness, with all categories achieving a "High" rating. Based on the open-ended responses, students identified several key advantages of the platform, particularly highlighting improvements in pronunciation, fluency, and the utility of having a private, objective "AI Speech Coach". This directly confirms the high scores achieved in the perceived usefulness and AI effectiveness criteria.

Moreover, the reported qualitative difficulties were minimal and primarily related to minor technical aspects, such as device lag, storage limits, or initial camera anxiety which aligns with the positive quantitative results regarding the platform's perceived ease of use. Students also offered highly constructive suggestions for system improvement, such as incorporating more interactive chat capabilities and explicit pronunciation modelling. This indicates their active learning engagement and positive overall perception, as well as the strong potential for ongoing refinement of the platform. Ultimately, these combined findings demonstrate that the developed AI-integrated speaking assessment is highly feasible in terms of usability and effectiveness. The positive student perceptions also support the product's practical validity, which will be further substantiated by the expert validation regarding content and construct validity presented in the following section.

Discussion

This study aimed to analyse the needs for AI-integrated speaking assessment, develop an AI-based speaking assessment using the Yoodli platform oriented toward sustainable tourism, and evaluate its feasibility in terms of validity and usability. The findings from both quantitative and qualitative data provide a comprehensive understanding of how AI can address existing challenges in speaking instruction and assessment.

The needs analysis revealed several critical issues in current speaking practices. Both teachers and students indicated that speaking assessment is still largely conducted manually, which limits the provision of immediate and consistent feedback. This condition does not fully support effective language learning, as emphasized by [Brown \(2004\)](#) and [Brown & Abeywickrama \(2010\)](#), who argue that assessment should be continuous and provide timely feedback to facilitate improvement. In addition, students reported difficulties in vocabulary, grammar, pronunciation, and confidence, indicating that speaking competence has not been optimally developed. According to [Luoma \(2004\)](#), speaking ability involves multiple dimensions, including linguistic accuracy and psychological readiness, suggesting that effective assessment should address both aspects.

Another significant issue identified was the lack of contextualization in speaking tasks. Despite being tourism students, learners were rarely exposed to tasks that reflect real-world communication in the tourism industry. This finding contradicts the principles of communicative language teaching and English for Specific Purposes (ESP), which stress the importance of meaningful and context-based communication ([Harmer, 2007](#); [J. C. Richards, 2006](#)). Furthermore, the absence of tourism-oriented content limits students' preparedness for professional demands, particularly in the context of sustainable tourism development ([Indonesia, 2021](#); [Organization, 2018](#)). At the same time, both teachers and students expressed strong interest in integrating AI into speaking assessment, indicating a readiness for innovation. This supports the arguments of [Chapelle \(2020\)](#) and [Holmes et al. \(2019\)](#), who highlight the potential of artificial intelligence to enhance language learning through automated feedback and data-driven insights.

Based on these needs, the development of an AI-integrated speaking assessment using the Yoodli platform was carried out as a solution to the identified gaps. The integration of AI enables automated, immediate, and objective feedback, addressing the limitations of traditional assessment methods. In line with [Chapelle \(2020\)](#), technology-enhanced language assessment can improve both efficiency and quality of evaluation. The Yoodli platform provides detailed analysis of speaking performance, including fluency, pronunciation, and filler word usage, which contributes to more reliable and consistent assessment. This is also supported by [Holmes et al. \(2019\)](#), who argue that AI can enhance the objectivity of assessment processes.

Moreover, the integration of sustainable tourism topics into speaking tasks ensures that the assessment is contextually relevant and aligned with ESP principles ([J. C. Richards, 2006](#)). Students are engaged in authentic tasks such as tourism promotion and problem-solving discussions, which simulate real-world communication. This approach not only improves language proficiency but also prepares students for professional interaction in the tourism sector. The iterative process of recording, receiving feedback, and revising performance also promotes self-regulated learning. [Viberg et al. \(2020\)](#) emphasize that feedback systems and learning analytics can support learner autonomy, which is evident in the way students use AI feedback to improve their speaking skills independently.

The feasibility of the developed assessment was supported by its validity, usability, and positive student perceptions. In terms of validity, the assessment demonstrated strong content and construct alignment, as the tasks were designed to reflect learning objectives and real-world communication needs. This aligns with [Brown \(2004\)](#), who stated that valid assessment had to measure the intended competencies. The use of AI-based performance indicators further strengthened construct validity by providing measurable aspects of speaking ability, such as fluency and pronunciation ([Chapelle, 2020](#); [Luoma, 2004](#)).

In terms of usability, the quantitative results showed high scores in ease of use, accessibility, and system reliability, which are further supported by qualitative findings indicating only minor technical difficulties. This suggests that the platform is practical and suitable for classroom implementation. According to Holmes et al. (2019), usability is a crucial factor in the successful adoption of educational technology, and the findings of this study confirm that the Yoodli platform meets this requirement.

Students' perceptions also highlight the effectiveness of the developed assessment. Positive responses related to motivation, engagement, confidence, and enjoyment indicated that AI integration creates a more interactive and supportive learning environment. This is consistent with Harmer (2007), who emphasizes that engaging learning experiences enhance student participation. Furthermore, the automated feedback provided by the system helps students improve pronunciation and fluency more effectively, supporting the role of immediate feedback in language learning (Brown & Abeywickrama, 2010).

Overall, the findings demonstrate that the AI-integrated speaking assessment using the Yoodli platform successfully addresses the limitations of traditional assessment, enhances students' speaking performance, and provides a more efficient and engaging learning experience. The integration of AI technology with contextualized tourism content creates a comprehensive assessment model that aligns with both pedagogical principles and industry needs. This study contributes to the field of language education by providing empirical evidence that AI-based assessment can improve not only learning outcomes but also the quality and effectiveness of assessment practices.

CONCLUSIONS

This study concludes that the needs analysis identified the necessity of an AI-integrated speaking assessment that addresses students' difficulties in vocabulary, grammar, pronunciation, and speaking anxiety while incorporating authentic sustainable tourism contexts. The developed Yoodli-based assessment module demonstrated high feasibility, achieving an overall expert validation score of 93.33%, including content validity (95.25%), construct validity (95.00%), and operational usability (90.25%). Positive student perceptions further indicated that AI-generated feedback supported independent practice, motivation, engagement, and confidence. Therefore, the module offers a practical assessment alternative for vocational English education, although teacher guidance remains essential for interpreting feedback and developing advanced communication skills. Teachers are encouraged to integrate AI tools into speaking instruction, while students should use automated feedback consistently to support self-regulated learning. Institutions should provide adequate infrastructure, training, and policy support. Future researchers should investigate long-term effects on speaking proficiency, compare AI platforms, and examine different educational contexts. Further development should also address technical limitations and improve user experience to ensure sustainable and effective implementation.

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