



An AI-aided Assessment-driven Instruction Model for Oral English Skill Development

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Abstract

This paper introduces the AI-aided Assessment-Driven Instruction (ADI) Model, an innovative educational approach that harnesses the power of artificial intelligence to enhance the development of oral English skills. The model is designed to integrate AI technology with ADI for oral English teaching, creating a synergistic blend that offers personalized learning experiences tailored to the unique needs and preferences of individual learners. It places a significant emphasis on the crucial role that AI can play in facilitating accurate and timely assessments, which are essential for guiding instructional decisions and for promoting the continuous improvement of oral communication abilities. The model aims to bridge the gap that often exists between conventional teaching practices and the latest technological innovations, with the ultimate goal of contributing to more effective and efficient strategies for improving oral English proficiency. By doing so, it seeks to provide a more dynamic and responsive learning environment that can adapt to the evolving demands of language education in the digital age.

Keywords

AI-aided ADI; Oral English skills; Assessment; Feedback; Technology integration

1. Introduction

Oral English skill holds paramount importance in the realm of English learning and communication, yet unfortunately, they frequently fall by the wayside in traditional Grammar-translation teaching methods. Assessment-driven instruction (ADI), which emphasizes the use of assessments to drive teaching and learning, has gained attention as a promising approach to address this gap. This paper aims to examine the theoretical underpinnings and practical implementations of ADI with the aid of AI in enhancing oral English proficiency.

2. Theoretical Foundations of ADI

ADI is grounded in several key theoretical frameworks that emphasize the role of assessment in enhancing teaching and learning. These foundations provide the basis for designing effective ADI models, particularly in the context of English language teaching. These include Formative Assessment Theory (hereinafter FAT), Constructivist Learning Theory (hereinafter CLT), Feedback Theory (hereinafter FT), Self-Regulated Learning Theory (hereinafter SLT), and technology-enhanced learning theory (hereinafter TELT).

2.1 Formative Assessment Theory

Formative assessment (henceforth FA) is a cornerstone of ADI, focusing on the use of ongoing assessments to inform

instruction and support student learning. Black and William (1998) defined FA as all those activities undertaken by teachers and/or students that provide information to be used as feedback to modify the teaching and learning activities in which they are engaged. It emphasizes the importance of feedback in helping students identify their strengths and areas for improvement. According to Carless (2007), FA can empower students to enhance their language proficiency through prompt feedback on their efforts and achievements. Analytically, it allows students to gain a clear understanding of what they have mastered, enables students to directly identify the gaps between their current levels and the expected goals, prompts students to think about their learning processes and methods, helps students develop the ability to evaluate their own learning, helps teachers identify students' unique strengths and talents, and boosts students' self-esteem and confidence through positive feedback on their strengths.

2.2 Constructivist Learning Theory

Constructivism, as proposed by Vygotsky (1978), posits that learning is an active process in which learners construct knowledge through interaction with their environment, encompassing all the individuals around them, like classmates, playmates, parents, and teachers, as well as the various elements in their surroundings, such as school and classroom settings. This theory underscores the importance of environment and social interaction in learning. According to constructionists, language learning is a social and collaborative process, knowledge is constructed primarily through students' own experiences and reflections, rather than solely through the input of others, such as teachers and parents. Teachers act as facilitators, guiding students to construct knowledge through the learning process, but not as fillers, putting the knowledge into the brain of the students.

In ADI, the application of constructivist principles is facilitated by collaborative activities, including group projects, pair work, group discussions, and role-plays, thereby enabling students to hone their language skills in authentic learning environments (Nation & Newton, 2009). These activities encourage active student participation, facilitating the exchange of ideas and the collaborative construction of knowledge. Through active engagement in language learning activities, students significantly enhance their understanding of the language and refine their communication skills.

2.3 Feedback Theory

Feedback theory, as articulated by Hattie and Timperley (2007), highlights the critical role of feedback in enhancing learning outcomes. Effective feedback provides students with information about their performance and guidance on how to improve. As for English learning, feedback can be classified into three types, namely corrective feedback, informative feedback, and formative feedback. Corrective feedback helps students identify and correct errors in their language use, thereby improving accuracy. Informative feedback informs students of their strengths and areas for improvement, allowing them to develop a comprehensive understanding of their performance. This type of feedback can boost students' self-esteem and confidence when they are praised for their strengths, while also motivating them to work on their weaknesses. Formative feedback is ongoing and focuses on the learning process rather than just the final product. It provides students with regular assessments and guidance throughout a project or course, helping them stay on track and make adjustments as needed. This continuous support can lead to significant improvements in students' understanding and mastery of the material.

In ADI, feedback is used to help students improve their language skills, such as pronunciation, grammar, and fluency. For example, AI-powered tools have been shown to enhance the learning experience by offering real-time feedback on speaking tasks, allowing students to make immediate corrections and improvements (Chapelle & Voss, 2016). This is echoed in various educational settings where AI technology is utilized to provide personalized learning experiences and immediate corrective feedback, thereby improving the efficiency and effectiveness of language education. Furthermore, feedback in AIDI (Artificial Intelligence-Driven Instruction) can be personalized and adapted to each student's unique learning needs. By leveraging the power of AI, teachers can provide more effective and efficient feedback, ultimately leading to improved learning outcomes for all students. Additionally, the use of AI in feedback can free up teachers' time, allowing them to focus on other aspects of instruction and provide more comprehensive support to their students.

2.4 Self-regulated Learning Theory

Self-regulated learning (SRL) theory emphasizes the role of learners in managing their own learning processes. According to Zimmerman (2000), SRL involves setting goals, monitoring progress, and reflecting on outcomes. The central ideas of SRL include goal-setting, self-monitoring, and self-reflection.

In the context of language learning, SRL can be particularly beneficial. Learners who practice self-regulation are more

inclined to engage deeply in meaningful learning activities, persevere through difficulties, and ultimately attain their language learning objectives. For instance, they may set specific, measurable, achievable, relevant, and time-bound (SMART) goals for improving their vocabulary, grammar, or speaking skills. They may also monitor their progress using language learning apps or journals, and reflect on their learning strategies, adjusting them as necessary to enhance effectiveness.

Moreover, the integration of technology, such as AI-driven language learning platforms (such as Superstar and Wisetree), can further support self-regulated learning. Educational platforms, leveraging AI, offer personalized learning paths tailored to individual student needs, real-time progress tracking to monitor each learner's advancement, and feedback mechanisms that align with the principles of SRL, thereby enhancing the learning experience. By utilizing these tools, learners can gain insights into their learning processes, identify areas for improvement, and make informed decisions about their learning strategies, ultimately leading to more effective and efficient language learning outcomes. In summary, ADI fosters SRL by motivating students to establish language learning objectives, track their advancements, and reflect on their achievements.

2.5 Technology-enhanced Learning Theory

The integration of technology into education has led to the development of technology-enhanced learning (TEL) theories, which emphasize the use of digital tools to support and enhance learning. In the context of ADI, technology can facilitate assessment and feedback processes, mainly including the following aspects.

Firstly, automated assessment and feedback systems can leverage digital tools to provide timely and personalized feedback to learners. For example, AI-driven platforms can analyze students' language performance in real-time and offer targeted suggestions for improvement. This immediate feedback helps learners identify and correct errors promptly, facilitating more effective language acquisition (Chapelle & Voss, 2016).

Furthermore, TEL theories advocate for the creation of interactive and engaging learning environments. Technology, such as virtual reality (VR) and augmented reality (AR), can serve as powerful tools to emulate real-life language scenarios, thereby bolstering the authenticity of assessments. By immersing learners in such environments, educators can assess students' language skills in context, rendering the assessment process even more purposeful and pertinent.

Finally, TEL theories underscore the significance of collaboration and peer interaction in the learning process. Platforms such as online forums, discussion boards, social communicative Apps, and collaborative tools facilitate peer feedback and assessment, allowing learners to capitalize on each other's strengths and address weaknesses. This peer-to-peer learning approach further amplifies the effectiveness of language assessments by offering diverse perspectives and providing constructive feedback.

3. Current Challenges in Oral English Skill Development

3.1 Limitations of Traditional Teaching Methods

Traditional English pedagogical approaches predominantly emphasize grammatical structures and lexical acquisition at the expense of oral communication development, resulting in constrained opportunities for authentic speaking practice.

Three principal limitations merit systematic examination. First, the disproportionate focus on written language components engenders a competence disparity where students demonstrate grammatical accuracy in written tasks yet encounter fluency deficits and psychological barriers in spontaneous verbal interactions. This imbalanced development of oral skills undermines comprehensive linguistic competence and restricts social communication efficacy. Second, current pedagogical frameworks lack standardized assessment mechanisms for spoken language proficiency, as evidenced by empirical studies on secondary English education. Students often lack access to timely diagnostic feedback regarding their oral performance, hindering their capacity to identify and rectify specific deficiencies, thereby perpetuating stagnation in speaking competence. Third, conventional methodologies generally fail to cultivate sufficiently immersive environments conducive to sustained oral practice. The absence of authentic communicative contexts and interactive task-based learning modalities frequently renders the acquisition process formulaic and demotivating, ultimately diminishing learner engagement in spoken language development.

These methodological constraints originate from fundamental design flaws in traditional teaching paradigms that undervalue the psycho-linguistic dimensions of speech production. The resultant pedagogical shortcomings not only restrict practical speaking opportunities but also compromise the quality of formative assessment and intercultural communication experiences. To address these systemic issues, curriculum reforms must prioritize three strategic interventions:

implementing balanced skill development frameworks, establishing evidence-based oral assessment protocols, and designing context-rich learning ecosystems. Contemporary technological advancements in language education present viable solutions for transcending these historical limitations and facilitating more robust oral competence development through enhanced interactivity and personalized feedback mechanisms.

3.2 Limitations of Traditional Assessment Methods

The assessment of speaking proficiency predominantly employs formative methodologies, including classroom participation and peer evaluation, complemented by summative approaches such as oral examinations and standardized testing protocols. While these conventional techniques provide meaningful data, they frequently fail to account for learner variability in individualized educational requirements and demonstrate limitations in comprehensiveness and objectivity when evaluating oral English competencies. Furthermore, the evaluative process in traditional paradigms exhibits excessive dependence on instructor subjectivity, potentially introducing systematic bias and assessment inconsistency. These systemic constraints inherent in both pedagogical and evaluative conventional methods underscore the critical necessity for innovative intervention strategies in oral language development and assessment, particularly within technology-enhanced learning ecosystems. Artificial intelligence systems, specifically language-based generative models with adaptive learning capabilities, offer novel solutions to these challenges through advanced language modeling and personalized feedback mechanisms.

3.3 Potential of AI-aided ADI in Speaking Teaching

AI-aided ADI represents a transformative pedagogical framework that systematically embeds formative assessment within instructional sequences. This methodology manifests substantial potential through its tripartite capacity to deliver instantaneous feedback, a customized instructional environment, and data-driven learning analytics. The principal advantages and developmental trajectories of AI-aided ADI implementation in oral English pedagogy can be articulated through five salient dimensions.

Firstly, AI-aided ADI enables the delivery of dynamically calibrated learning content and exercises commensurate with individual learners' linguistic competencies. Through continuous diagnostic evaluation, the system maintains optimal challenge levels, effectively circumventing cognitive overload or disengagement phenomena. The platform's capacity to provide granular feedback mechanisms facilitates precise identification and remediation of phonological, morphosyntactic, and lexical errors, outperforming conventional correction methodologies.

Secondly, AI-aided ADI constructs multi-modal immersive environments for oral communication practice. Leveraging virtual reality simulations and augmented reality interfaces, the technology replicates authentic discourse contexts spanning professional, academic, and social domains. This multi-modal scaffolding enhances interactional authenticity while stimulating metacognitive awareness, thereby increasing learner motivation and retention rates.

Thirdly, AI-aided ADI implements multidimensional assessment matrices for comprehensive oral proficiency evaluation. Through spectral analysis of prosodic features, automated speech recognition (ASR) of segmental phonetics, and natural language processing (NLP) of syntactic structures, the system generates longitudinal competency profiles. These analytics enable precision tracking of fluency development, phonological accuracy, and pragmatic appropriateness across temporal dimensions.

Fourthly, AI-aided ADI facilitates adaptive learning pathways through machine learning algorithms. By processing multi-modal interaction data, the system identifies individual developmental trajectories and administers targeted micro-interventions. This personalized paradigm optimizes the interlanguage restructuring process through focus-on-form strategies and pushes output opportunities.

Fifthly, AI-aided ADI ensures criterion-referenced formative feedback through computational linguistics frameworks. The system's objective evaluation metrics circumvent human rater variability while providing immediate corrective feedback on suprasegmental features, turn-taking strategies, and discourse coherence markers. This real-time evaluation-intervention cycle accelerates interlanguage fossilization prevention.

Collectively, AI-aided ADI establishes a paradigm shift in L2 oral competency development through its tripartite integration of continuous assessment, personalized remediation, and predictive analytics. The technology's capacity to quantify implicit knowledge development and scaffold explicit knowledge acquisition addresses critical limitations in conventional oral pedagogy. As deep learning architectures evolve, the convergence of affective computing and multi-modal interaction analysis promises enhanced adaptive capabilities, potentially revolutionizing second language acquisition methodologies.

4. An AI-aided ADI Model for Oral English Teaching

4.1 Core Components

An effective AI-aided ADI model for speaking teaching includes the following components: Firstly, it incorporates an advanced natural language processing engine that can understand, analyze, and evaluate students' spoken language with high accuracy. This engine serves as the foundation for all assessment and feedback activities, ensuring that the information provided to students is reliable and useful. Secondly, the model includes a comprehensive database of language learning resources and exercises. These resources are designed to cater to different language levels and learning styles, enabling the system to tailor learning content to individual student needs. This ensures that students receive challenges that are appropriate for their current proficiency level, promoting steady progress and preventing frustration or boredom. Thirdly, the AI-aided ADI model features a user-friendly interface that makes it easy for students and teachers to interact with the system. The interface should be intuitive and accessible, allowing users to navigate through the various functions and features with ease. This enhances the overall user experience and encourages greater adoption and use of the model in the classroom. Lastly, the model incorporates machine learning algorithms that continuously improve the accuracy and effectiveness of the assessment and feedback provided. By analyzing data from student interactions and performance, the algorithms can identify patterns and trends, allowing the system to adapt and optimize its functionality over time. This ensures that the AI-aided ADI model remains relevant and effective as students' language skills develop and evolve.

4.2 Fundamental Principles

Within AI-mediated language acquisition frameworks, establishing well-defined objectives for oral proficiency constitutes a critical prerequisite. These objectives should encompass multidimensional competencies including linguistic fluency, phonological accuracy, and pragmatic communicative efficacy. Functioning as a strategic framework, these delineated goals enable learners to systematically comprehend developmental expectations while formulating evidence-based strategies for oral skill enhancement.

Secondly, it is important to implement comprehensive assessment methodologies. The evaluation of speaking proficiency necessitates the integration of multidimensional assessment paradigms. This entails the synergistic application of formative assessment mechanisms, characterized by continuous performance monitoring and developmental feedback, complemented by summative assessment protocols designed for terminal proficiency evaluation. Furthermore, the pedagogical architecture should incorporate tripartite evaluation modalities: metacognitive self-assessment for learner reflexivity, collaborative peer-assessment fostering critical listening competencies, and expert-led teacher evaluation providing domain-specific diagnostic feedback.

Thirdly, it is imperative to establish temporally proximal, pedagogically constructive feedback mechanisms. Such feedback architectures should exhibit diagnostic precision, operational practicality, and motivational efficacy, employing scaffolded guidance to stimulate oral performance refinement. Optimal feedback formulations must articulate commendations of demonstrated competencies while systematically addressing improvement domains through actionable recommendations, thereby catalyzing iterative cycles of speaking proficiency development.

4.3 Implementation Procedures

The implementation of AI-aided ADI comprises three crucial stages: Pre-class Diagnosis, In-class Intervention, and Post-class Reinforcement.

Pre-class Diagnosis: Initial assessments to identify students' speaking levels and learning needs. This phase involves conducting a series of diagnostic tests and evaluations to gauge the proficiency of students in spoken English. The objective is to accurately assess their current abilities, recognize their strengths and address their weaknesses, and identify specific areas where they may require additional support or enhancement. In this way, educators can customize their teaching strategies to accommodate the diverse learning needs of the classroom, ensuring that each student receives the appropriate level of attention and resources to improve their speaking skills.

In-class Intervention: Interactive activities, such as immersive role-plays and stimulating group discussions, are thoughtfully designed based on the outcomes of initial assessment results. During this stage, the curriculum is enriched with a variety of engaging and participatory exercises that are directly informed by the initial diagnostic assessments. Role-plays immerse students in real-life scenarios, enhancing their speaking skills within a structured yet dynamic learning environment. Group discussions foster collaborative learning and enhance teamwork skills among students. These activities are carefully crafted to address the individual learning needs identified earlier, ensuring that each student is

challenged and supported appropriately.

Post-class Reinforcement: Follow-up assessments and feedback to consolidate learning outcomes. Following the interactive session, it is imperative to assess students' progress and offer insightful feedback. Follow-up evaluations function as milestones to gauge students' improvement since the initial assessment and to pinpoint any lingering deficiencies in their knowledge base or skills. Feedback is then given to students, highlighting their achievements and offering guidance on areas that need further development. This reinforcement stage is essential for solidifying the learning outcomes and preparing students for the next steps in their educational journey.

5. Conclusion

This paper highlights the significance of integrating an AI-aided ADI model in oral English teaching. By drawing on various educational theories, such as formative assessment, constructivist learning, and feedback theory, the paper outlines the core components, principles, and implementation procedures for this innovative teaching approach. The AI-aid ADI model not only ensures that assessments are tailored to students' individual needs but also promotes a student-centered learning environment where continuous feedback and improvement are paramount. The pre-class diagnosis, in-class intervention, and post-class reinforcement stages collectively form a robust framework that supports students in developing their speaking proficiency. As educational technologies continue to evolve, the AI-aided ADI model stands as a testament to the transformative potential of leveraging technology to enhance language learning outcomes, as evidenced by the success of AI-driven language learning applications like Speak and Xunfei, which have attracted significant investments and are reshaping the language learning landscape.

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