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DEVELOPING AI-BASED SELF-ASSESSMENT METHOD IN THE PROCESS OF OPTIMIZING EFL INCLUSIVE LEARNING ACHIEVEMENT

by

Ulul Azmi*
English Language Education, Universitas Nadhlatul Ulama Yogyakarta, Indonesia
luluk@unu-jogja.ac.id

Berli Arta
English Language Education, Universitas Nadhlatul Ulama Yogyakarta, Indonesia
berli@unu-jogja.ac.id

corresponding author

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Abstract:

This research aims to develop AI-based self-assessment method to optimize EFL inclusive learning. This study employed a Research and Development (R&D) approach using ADDIE model consisting of analysis, design, development, implementation, and evaluation. AI based self-assessment module was created to allow students to reflect on their own learning and receive simple feedback that fits their needs. The sample of this study involved 20 university students. AI-based self-assessment module was designed with user-friendly explanations, self-check questions, reflection activities, and AI-generated feedback. The data were validated by material experts with an average score of 3.5, categorized as very good. Therefore, it can be concluded that developing AI-based self-assessment method is appropriate to be implemented in inclusive learning. The result shows that the module is helpful and suitable to be used in EFL inclusive classrooms. It made learning more flexible, helped students to understand the material better, and supported them to learn more independently. This implies that lecturers can start using AI-based self-assessment modules as practical tools to support every student's learning needs. By giving students simple feedback and space to reflect on their progress, this approach can help them become more confident, independent, and actively involved in their own learning.

Keywords*: AI-based module, inclusive learning, self-assessment, university students*

Abstrak:

Penelitian ini bertujuan untuk mengembangkan metode penilaian diri (self-assessment) berbasis AI untuk mengoptimalkan pembelajaran inklusif EFL. Penelitian ini menggunakan endekatan Research and Development (R&D) dengan model ADDIE yang terdiri dari analisis, desain, pengembangan, implementasi, dan evaluasi. Modul penilaian diri berbasis AI dibuat untuk memungkinkan mahasiswa merefleksikan pembelajaran mereka sendiri dan menerima umpan balik sederhana yang sesuai dengan kebutuhan mereka. Sampel penelitian ini melibatkan 20 mahasiswa. Modul penilaian diri berbasis AI dirancang dengan penjelasan yang ramah pengguna, pertanyaan pengecekan diri, aktivitas refleksi, dan umpan balik yang dihasilkan AI. Data divalidasi oleh ahli materi dengan skor rata-rata 3,5 yang dikategorikan sangat baik. Dengan demikian, dapat disimpulkan bahwa pengembangan metode penilaian diri berbasis AI layak untuk diterapkan dalam pembelajaran inklusif. Hasil penelitian menunjukkan bahwa modul ini bermanfaat dan sesuai digunakan dalam kelas inklusif EFL. Modul

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tersebut membuat pembelajaran lebih fleksibel, membantu mahasiswa memahami materi dengan lebih baik, serta mendukung mereka untuk belajar lebih mandiri. Ini menunjukkan bahwa para dosen dapat mulai menggunakan modul penilaian diri berbasis AI sebagai alat praktis untuk mendukung kebutuhan belajar setiap mahasiswa. Dengan memberikan umpan balik sederhana dan ruang bagi mahasiswa untuk merefleksikan kemajuan mereka, pendekatan ini dapat membantu mereka menjadi lebih percaya diri, mandiri, dan aktif terlibat dalam proses belajar mereka sendiri.

***Kata kunci**: modul berbasis AI, penilaian diri, pembelajaran inklusif, mahasiswa*

INTRODUCTION

The integration of artificial intelligence in language education creates a mutually beneficial relationship that fundamentally transforms pedagogical approaches and instructional methodologies (Wu et al., 2024). As AI-driven educational technologies become increasingly embedded in academic environments, they are revolutionizing conventional teaching and learning frameworks (Umar, 2024). According to Narciso (2024), the ability of teachers and parents to understand and manage generative AI technology is essential to fully harness its benefits in educational contexts. Consequently, educators operating within AI-enhanced instructional contexts must develop new competencies and adapt to the evolving demands of technology-mediated pedagogy (Taşçı & Tunaz, 2024). The implementation of AI in language instruction offers significant potential for enhancing educational outcomes through the deployment of customized learning solutions that optimize effectiveness for both students and instructors (Li, 2024). Contemporary AI-enabled educational tools, including intelligent tutoring systems, conversational learning agents, and computerized evaluation mechanisms, are increasingly adopted in educational settings, facilitating immediate instructional feedback and promoting greater learner engagement (AbuSahyon et al., 2023).

Building on transformative potential, AI technologies also promote personalized learning experiences by adapting to individual student needs and learning styles (Halkiopoulos & Gkintoni, 2024). These adaptive systems provide targeted support that can address diverse learner challenges, leading to improved engagement and academic achievement (Hussain et al., 2024). Moreover, AI facilitates real-time data analytics for educators, enabling them to make informed instructional decisions and refine teaching strategies dynamically (Aarset & Johannessen, 2022). Despite these promising advancements,

integrating AI in education requires careful consideration of ethical issues such as data privacy, equity, and transparency to ensure that technology serves all learners fairly (Aarset & Johannessen, 2022). Therefore, fundamental to explore the most effective ways to utilize the capabilities AI offers for education, avoiding the possible downsides while improving the language pedagogy and drew learning (Hayati et al., 2022).

Therefore, it is especially important to find the best ways to use AI's capabilities in education, not only to enhance language teaching and learning outcomes but also to promote inclusive education. AI technology has the power to adjust to the unique needs of diverse learners, including those various backgrounds. By offering personalized assistance and reducing barriers, AI can open doors for more students to participate fully and succeed in their learning journey (Hayati et al., 2022). Through the inclusive application of AI in language education, every learner, regardless of their background or challenges, gains an equal opportunity to access effective and fair learning experiences. This contributes to creating a more equitable and welcoming educational environment for all (Salas-Pilco et al., 2022).

One of the challenges in education, particularly at the university level, is implementing inclusive education an approach focused on providing equal access to learning opportunities for all students, including those with special needs. Inclusive education recognizes that every student brings unique strengths and learning requirements, calling on educational institutions to embrace and respond to this diversity. Most importantly, it emphasizes that such support should take place within regular classrooms in students' local schools (Woodcock et al., 2022). The concept of inclusive education is quickly becoming popular around the world as an effective approach for creating similar educational institutions and as a fundamental human right (Rahmi et al., 2024). Such inclusive settings not only support the academic and social development of students with disabilities but also encourage empathy and positive social attitudes among their peers without disabilities. Successful inclusive education requires thoughtful planning, collaborative efforts among teachers, administrators, and families, along with ongoing professional development for educators to meet the varied needs of all learners (Robiyansah et al., 2020). In the context of increasingly

diverse education, it is important to ensure that all students, including those with special needs, can reach their full potential.

To support student-focused learning, teachers need simple methods that help all students get involved. One helpful method is self-assessment, which allows students to take more control of their own learning. Self-assessment is one way to help students become more independent in their learning. By using self-assessment, students can reflect on what they have learned, understand what they need to improve, and become more responsible for their learning journey. When combined with technology, such as Artificial Intelligence (AI), self-assessment becomes more effective. AI can give students instant feedback, guide their reflections, and help them set learning goals based on their performance (Molenaar et al., 2023).

According to Kunnan, (2017), valid and reliable assessment practices are essential for accurately measuring student progress and informing instructional decisions. Chong and Reinders, (2023) emphasizes that innovative assessment approaches that leverage technology can enhance learner engagement and provide richer insights into language development. In this context, assessment and evaluation are crucial to ensure that every student can reach their full potential. However, traditional assessment methods often fail to accurately reflect individual student progress, especially in diverse learning environments (Sandoval Mena & Waitoller, 2025). This can lead to students with special needs not receiving the attention and support they require, consequently affecting their learning process (Carrillo Cruz et al., 2023).

There are opportunities to improve different self-assessment techniques due to technological advancements, particularly artificial intelligence. By implementing this method, learners can evaluate themselves, recognize their strengths and weaknesses, and choose appropriate learning paths (McDonald et al., 2024). Furthermore, the use of AI in self-assessment methods also enables the provision of more personalized and meaningful feedback to learners. Therefore, the use of these methods is one way to promote inclusive learning (Hameed et al., 2024). The application of AI in education can increase learner engagement and provide a more personalized learning experience, which is crucial in the context of

inclusive education (Moussa et al., 2024).

Furthermore, the integration of AI-driven self-assessment features could help to identify individual learning needs in real time, thus supporting a more effective personalization of remedial actions by teachers. As well as responding to the range of learning needs that arise, it also creates a climate of motivation within the school, and provides for student independence, both of which are key for inclusive schools. AI-supported feedback systems have been found to increase engagement and to improve academic performance in students of varying abilities (Mathai, 2024). Through these technologies, educational institutions can create responsive and flexible learning environments that value accessibility and equity.

The remarkable potential of AI for educational transformation faces multiple real-world obstacles that stand between its implementations. A key obstacle exists because numerous educators do not possess adequate expertise required to implement technology confidently within their everyday teaching routines. The latest research shows that educators show doubt and reluctance about using digital tools during their teaching activities (Parveen & Ramzan, 2024). The effectiveness of AI tools depends heavily on proper support since even well-designed applications need it to achieve meaningful impact. Teachers need accessible training alongside practical resources because this combination will enable them to use AI in ways which match their professional needs and personal competence level.

It is important to acknowledge that access to technology is not consistent for every learner. While AI has the potential to enhance learning opportunities, it typically requires access to personal or school-provided devices and stable internet connections resources that are not always available, particularly for students from under-resourced communities. In such cases, differences in access can result in exclusion rather than inclusion. Therefore, educational technology must be viewed not only as a tool for innovation, but also as an equitable resource that supports all learners. This study goes beyond simply developing AI-based self-assessment mechanisms; it also explores how these tools can be implemented in inclusive and effective ways, ensuring that students from all backgrounds have meaningful

opportunities to grow, reflect, and succeed in their learning journey (Mijwil et al., 2023)

Self-assessment enabled by AI is anticipated to improve learning quality by offering more relevant and personalized feedback. It assists students in identifying their areas of strength and weakness so they can create learning plans that work better. Furthermore, artificial intelligence (AI) in self-assessment could result in more intelligent and flexible evaluation procedures that better comprehend the needs of each individual learner, and consequently encourage better learning outcomes (Bachman, 2020). According to Kunnan (2017) evaluating language assessments goes beyond just making sure the tests are technically sound. It is about understanding how these assessments truly affect learners and their educational journeys. When we combine smart AI-driven tools and practical tests like the OET with thoughtful evaluation, we create assessments that feel fairer and more personalized. This approach helps learners get feedback that really speaks to their needs, making the whole learning process more meaningful and effective

Based on pre-survey at Nahdlatul Ulama University, it has indicated that many students were facing significant challenges with respect to their learning progression due to some common key issues. Firstly, students appeared to lack self-awareness in their learning and struggle to assess their strengths and weaknesses. Without an accurate understanding of themselves as learners, many did not know how to set personal goals for their learning or effectively track their learning progression. Secondly, students' personalized feedback from teachers was very limited. Due to large class sizes and time restraints, feedback was often limited to general comments about the group that did not identify individual learning needs; especially for students who needed some extra support. Thirdly, the level of student engagement in the assessment process appeared to be low. Learners viewed established modes of assessment as rigid and unrelated to students' knowledge understanding, leading to lower motivation and participation. Finally, the use of digital technology features to support inclusive learning was insufficient. While there've been some options, students with diverse learning needs would be able to take advantage of adaptive and accessible educational technologies learning more effectively if digital platforms had been functional or incorporated into classroom practice.

Therefore, the researchers decided to develop an AI-based self-assessment method to support inclusive learning. This decision was based on the findings from the pre-survey, which indicated that many students faced difficulties such as low self-awareness, limited personalized feedback, lack of engagement in the assessment process, and inadequate access to inclusive digital tools. These issues kept students from getting their highest learning potential, particularly those with special needs. When used properly, self-assessment can motivate students to evaluate their own learning, determine their areas of weakness, and create personal objectives.

However, this method frequently lacks the personalized attention and responsiveness that many students need in traditional settings. Learners can get meaningful, adaptive, and real-time feedback that is customized to their individual needs and skills by incorporating artificial intelligence into the self-assessment process. According to Martínez-Comesaña et al., (2023) the integration of artificial intelligence (AI) significantly enhances student assessment methods in primary and secondary education. AI contributes by predicting academic performance, providing more objective and automated evaluations through neural networks and natural language processing, and employing educational robots to analyze learning processes. It also enables assessments based on meaningful learning activities rather than traditional tests and helps educators identify key factors that make learning more engaging.

This research focuses on developing an AI-based self-assessment module for inclusive learning to solve problem. The module is designed to support students with different learning needs by helping them monitor their progress and encouraging independent learning. It includes clear instructions, reflection activities, and AI-powered feedback features that help students understand their learning outcomes. The development of the AI-Based Self-Assessment Method for Inclusive brings meaningful contributions to the field of education. This module is expected to support students in becoming more active and independent learners, help them reflect on their progress, and adapt to various learning needs in inclusive classrooms. It also promotes the use of technology in education, especially AI, as a tool that can give personalized feedback and make learning more effective. Thus, this study aimed to

develop an AI-based self-assessment method to optimize EFL inclusive learning. Specifically, it seeks to answer the following research questions:

1. How can an AI-based self-assessment method be developed to effectively support inclusive learning in EFL contexts?
2. Identify the impact of implementing an AI-based self- What is the impact of implementing an AI-based self-assessment method on students' learning achievement within inclusive education settings?

METHOD

Design

This study used the Research and Development (R&D) method and applied the ADDIE model to create an AI-based self-assessment method designed to help improve learning outcomes in inclusive EFL classes.

Figure 1. ADDIE Model

In this study, the AI-based self-assessment method is understood as a user-friendly digital tool powered by artificial intelligence, which allows students to independently evaluate their progress in English learning while accommodating different learning needs within an inclusive environment. Learning achievement refers to the students' progress and improvement in English proficiency, measured through tests and assignments conducted before and after using the AI tool to reflect their actual understanding and skills development.

Participant

The participants of this study were 20 students from the English Education Department at Nahdlatul Ulama University (UNU) Yogyakarta. These subjects were selected using purposive sampling to represent intermediate-level English as a Foreign Language (EFL) learners engaged in inclusive education. The sample size is recognized as limited, because all students were included as participants. However, the size yielded valuable preliminary findings before replicating future research with larger populations.

Instrument

The instruments used in this study adopt ADDIE design models. Those phases are **analysis, design, development, implementation, and evaluation**. A distinct instrument is employed in every phase to gather and examine data, and to support a structured and thorough process for creating the AI-based self-assessment method.

Observation checklist constitutes analysis phase to capture determined information about classroom dynamics, student participation, and interactions between students and lecturers in an inclusive EFL learning environment. These checklists guided researchers systematically recording behaviors and challenges as accompanied by field notes.

In the design phase, creating ideas and findings into a more concrete plan for what the module would look like and how it would work. This design stage is an important part of the development process, students' need, and lecturers in inclusive learning environments.

In the development phase, instruments, the module and expert judgement were reviewed. The module provided a detailed framework for the tool's content and functionality, while expert judgment offered professional insights and recommendations to ensure the tool's accuracy and relevance.

At this implementation phase, the researchers gave guidance to lecturers on how to use the AI-based module, including how to access the content and explain the self-assessment features to students. Then, the researchers gave the questionnaires to the students as users. Those questionnaires were distributed to collect their opinions.

The final phase is evaluation. In this phase, the researchers looked at how useful, relevant, and effective the module was for students in real learning situations. This step helped the researchers to make sure the module really worked for students with different learning needs and supported them in understanding and reflecting on what they learned.

Data collecting technique

In this study, data were collected through ADDIE design model to gain a clear understanding of how the AI-based self-assessment method works in EFL inclusive learning environment.

In the analysis phase, the researchers closely observed classroom interactions and started by identifying the main problems in the current learning process. The researchers conducted need analysis with the aim of obtaining information for reference for developing an AI-based self-assessment method and the implementation of the product in inclusive EFL learning.

In the design phase, researchers conduct focused discussions with lecturers to gather ideas. The design of the module focused on making learning easier, more interactive, and more accessible for all students, especially those who have different learning styles or need. The goal was to create a learning module that students could use independently, with the support of AI-based features to guide them in assessing their own progress.

In this development phase, the researchers created actual learning material and assured that it was useful, comprehensible, and fit the students and lecturers in inclusive learning environments. The researchers developed an AI-based self-assessment instrument designed specifically for inclusive learning.

In the implementation phase, the researchers implemented an AI-based self-assessment and administered questionnaires to students to gather their feedback on their experience using the module. It aimed to assess its usability, clarity, and impact on their learning process. In the final evaluation phase, the researchers analyzed if the module was practical, meaningful, and effective when applied to real teaching and learning activities.

Through this step, they ensured the module could accommodate different learners' needs while enhancing students' comprehension and self-reflection.

Data analysis technique

Adopting ADDIE instructional design model, the data analysis techniques was carefully aligned with the objectives of each phase to ensure accuracy, completeness, and validity of the findings.

The data were analyzed using qualitative analysis during analysis phase, where observations, interview transcripts, and field notes were categorized to identify key themes and recurring patterns that informed the design decisions. In the design phase, qualitative content analysis (CCA) organized and summarized suggestions. They were synthesized into design specifications shaping the AI-based self-assessment tool's structure and features, ensuring alignment with inclusive EFL learners' needs.

During development, expert judgment data were analyzed through qualitative content analysis (QCA) and supported by quantitative scoring techniques (QST). In implementation, quantitative data from questionnaires were analyzed descriptively (frequencies, percentages, means) to capture students' opinions, satisfaction, and usability perceptions. Finally, in the evaluation phase, the researchers carefully examined the data using a qualitative descriptive approach. The focus was to tell the story of the students' experiences, reflections, and feedback on the module to understand how practical, useful, and effective it was in real classroom settings.

By looking closely at repeated ideas and opinions, they were able to see patterns that revealed how well the module met different learners' needs, helped them understand the material, and encouraged them to think about their own learning.

RESULT AND DISCUSSION

Result

The questionnaire was distributed to students. This table displays the students' responses regarding their needs and preferences for an AI-based self-assessment method aimed at optimizing inclusive EFL learning achievement.

Table 1. Questionnaire

No	*Statement*	*SS*		*S*		*R*		*TS*		*STS*	
1	*The AI-based self-assessment helps me identify my learning strengths effectively.*	10	50%	9	45%	1	5%	0	0%	0	0%
2	*The feedback provided by the AI assessment is clear and easy to understand.*	7	35%	13	65%	0	0%	0	0%	0	0%
3	*The AI self-assessment motivates me to reflect on my English learning progress.*	7	35%	13	65%	0	0%	0	0%	0	0%
4	*This module does not provide clear instructions on how to use the AI-based self-assessment method.*	0	0%	0	0%	2	10%	13	65%	5	25%
5	*Using the AI-based tool increases my confidence in learning English.*	9	45%	11	55%	0	0%	0	0%	0	0%
6	*The module presents clear instructions for using the AI self-assessment method.*	8	40%	11	55%	1	5%	0	0%	0	0%
7	*The AI assessment adapts well to my individual learning pace and style.*	10	50%	10	50%	0	0%	0	0%	0	0%
8	*I do not feel that the AI assessment adapts well to my learning style.*	0	0%	0	0%	0	0%	10	50%	10	50%
9	*The interactive features of the AI module keep me engaged during assessments.*	10	50%	10	50%	0	0%	0	0%	0	0%
10	*I do not find the feedback from the AI assessment tool helpful in improving my English skills.*	0	0%	0	0%	1	5%	9	45%	10	50%
11	*The module design is user-friendly and easy to navigate.*	9	45%	9	45%	2	10%	0	0%	0	0%
12	*The AI self-assessment provides useful suggestions for further study and practice.*	6	30%	14	70%	0	0%	0	0%	0	0%
13	*I feel the AI method supports my learning needs as a diverse EFL learner.*	9	45%	11	55%	0	0%	0	0%	0	0%
14	*The self-assessment process helps me track my progress over time effectively.*	11	55%	8	40%	1	5%	0	0%	0	0%
15	*The use of AI in this module makes the learning process more personalized and meaningful.*	9	45%	8	40%	3	15%	0	0%	0	0%

Then, to ensure the quality and appropriateness of the developed module, an expert review was conducted involving both content and media. The module was thoroughly evaluated to assess its relevance, accuracy, and effectiveness in supporting the target learners. The feedback from these experts provided valuable insights that guided refinements to improve the module's usability and instructional value. Two experts reviewed the module: a material expert (see *Table 2*) and a media expert (see *Table 3*).

Table 2. Material Expert

The result of material expert validation

No	Aspects	Analysis	Result
1	Content Feasibility	Total score	18
		Xi	3,6
		Category	Very Good
2	Language	Total score	17
		Xi	3,4
		Category	Very good
Total Average			3,5
Final Category			Suitable for use with little revisions

Table 3. Media Expert

The result of media expert validation

No	Aspects	Analysis	Result
1	Text display	Total score	17
		Xi	3,6
		Category	Very good
2	Lay-out	Total score	18
		Xi	3,6
		Category	Very good
Total Average			3,6
Final Category			Suitable for use with little revisions

Discussion

Inclusive learning

Students learning English as a Foreign Language (EFL) experience varied learning need, which are addressed in an inclusive learning framework. This approach accommodates

diversity among learners to create an equitable learning environment. After implementing an inclusive learning module, students responded to a questionnaire to evaluate its effectiveness. The results showed that most statements received positive feedback, with more than 50% of students expressing satisfaction or strong satisfaction, indicating an overall response.

Specifically, the first statement received unanimous positive feedback, with 50% strongly agreeing and 46% agreeing. The second and third statements also saw full approval, with no students disagreeing or uncertain. Conversely, the fourth and ninth statements had mixed feedback, suggesting dissatisfaction or lack of clarity in parts of the module. The eighth and tenth statements marked the highest dissatisfaction, with about 50% of students responding negatively. Other statements such as the fifth, sixth, seventh, eleventh, thirteenth, and fourteenth had high satisfaction rates, confirming the module's strengths.

In summary, the overall satisfaction rate from the questionnaire was above 50% for most items, reflecting positive reception but also indicating areas needing further improvement in the inclusive EFL module (Adapted from questionnaire data).

Building on this, the inclusive learning model that incorporates AI-based self-assessment shows enormous potential in optimizing individual student learning achievement through a more personalized and adaptive learning process. AI enables students to perform real-time self-assessment of their understanding and skills, helping them gain quick and relevant feedback that enhances their awareness of strengths and weaknesses in learning (Kunnan, 2017;Halkiopoulos & Gkintoni, 2024). Furthermore, AI-based self-assessment supports the development of learner autonomy in inclusive education by encouraging students to actively manage their own learning process, reducing dependence on teachers as the sole source of information, and improving reflective and evaluative skills regarding their learning outcomes. Thus, AI serves not only as an assistive tool but also as a facilitator for the growth of metacognitive competencies in students(Robiyansah et al., 2020;Carrillo Cruz et al., 2023).

AI based self-assessment.

Based on the expert judgment validation, the AI-based self-assessment module received positive evaluations overall. Material experts gave the content a score averaging 3.6,

which falls into the "Very Good" category. They felt the module was clear, relevant to inclusive learning needs, and well-organized. The materials aligned well with student abilities and learning objectives, and the AI features along with the reflection prompts supported principles of inclusive and independent learning. In terms of language, the experts rated it at 3.4, still "Very Good," noting that the language was simple, appropriate for university students, and easy to understand, with clear explanations suitable for learners at different English proficiency levels. The final average score of 3.5 indicates the module is suitable for use, with just minor adjustments suggested before its practical implementation.

Similarly, media experts evaluated the module's visual presentation very positively, awarding an average score of 3.6 for text display. They found the text clear, legible, and visually supportive of learning, with font choices and formatting designed to cater to diverse student needs, enhancing accessibility. The layout was also rated 3.6, seen as well-organized with thoughtful use of spacing, images, and structure that helps students stay focused without distraction. Overall, the media expert's feedback confirms the module's readiness for use, recommending only small improvements to enhance visual appeal and usability prior to real classroom use.

However, the success of AI-based self-assessment depends highly on students' technological operational skills. Students who are slow learners or have limited digital literacy require more intensive guidance to maximize the benefits of AI in self-assessment. This indicates that AI cannot fully replace human mentorship in inclusive learning, necessitating a constructive collaboration between AI technology and teacher intervention to ensure effective learning (Mohebbi, 2025;Subandi & Us, 2024). The implementation of AI in inclusive learning also shows promise in delivering personalized learning materials and assessments tailored to each student's needs and capabilities. Still, challenges related to infrastructure readiness, teacher training, and ethical and data privacy issues must be addressed to ensure sustainable and optimal AI integration in education. With appropriate collaboration between AI and the teacher's role, AI-based self-assessment can provide more effective and meaningful learning outcomes for all students (Halkiopoulos & Gkintoni, 2024;Mohebbi, 2025).

CONCLUSION AND SUGGESTION

Conclusion

This study revealed that developing an AI-based self-assessment method significantly helps in optimizing inclusive EFL learning achievement by focusing on key variables such as student engagement, self-regulated learning, and inclusive EFL learning achievement. The results indicated that this method supports students in becoming more actively involved in their English learning process by providing timely and useful feedback, as well as helping them monitor their own progress. Students also reported increased confidence and motivation, which contributed to improved learning outcomes.

The experts who reviewed the method gave positive feedback, stating that it matches the curriculum goals and uses technology effectively to support students with different learning needs. They also shared suggestions to improve the method, such as adjusting the content to suit various skill levels and making the platform easier for all students to access. Their feedback also emphasized the importance of adding materials that are relatable and culturally relevant to help students better connect with the lessons.

Overall, the study concludes that this AI-based self-assessment approach is a valuable tool for EFL learning, providing both teaching and technology benefits. It helps students become more independent in their learning while also allowing teachers to monitor their progress more effectively. This research also offers useful insights into how modern digital tools can improve inclusive learning outcomes and presents a model that can be adapted to different educational settings.

Limitation

This study has several important limitations that should be acknowledged. First, the number of participants was relatively small, involving only 20 intermediate-level EFL students from a single university. Because of this, the findings may not fully represent learners with different language levels, backgrounds, or learning environments. Second, the research focused on developing and implementing one specific AI-based self-assessment tool

based on the ADDIE model. Using different instructional approaches, technologies, or design frameworks might lead to different results and offer additional perspectives. Third, although multiple data collection methods—such as interviews and classroom observations—were used, incorporating other methods like surveys or longitudinal studies could provide deeper insights and stronger evidence to support the findings.

Additionally, the research design and sample selection could be improved to better capture a wider range of learner experiences and contexts. By openly recognizing these limitations, the study shows a clear understanding of its scope and boundaries. It also provides useful guidance for future research to build upon these findings, expand the investigation, and further explore the potential of AI-based assessment tools in enhancing inclusive EFL learning.

Implication

The findings of this study have meaningful implications for both teaching practice and theoretical development in the field of EFL learning. From a practical perspective, the results highlight how AI-based self-assessment tools can improve classroom teaching by encouraging students to take a more active role in their own learning. By receiving ongoing feedback and tracking their progress, students become more aware of their strengths and areas that need improvement. This helps teachers design more targeted instruction, offer personalized support, and create a more inclusive learning environment where every student can grow at their own pace.

From a theoretical perspective, the study contributes to the understanding of how technology-supported self-assessment can strengthen key aspects of language learning, such as learner autonomy, motivation, and self-regulation. It provides evidence that digital tools are not only effective assessment instruments but also valuable components of learner-centered approaches. These findings deepen existing theories on self-directed learning and show how technology can bridge the gap between traditional assessment methods and more dynamic, student-driven learning experiences.

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BIO-PROFILE

Ulul Azmi holds a bachelor's degree in English Language Education from Universitas Negeri Yogyakarta and her master's degree in applied Linguistics with a concentration in English Language Education from Universitas Negeri Yogyakarta. She is now an active lecturer at Universitas Nahdlatul Ulama Yogyakarta. Her expertise is in language assessment and Evaluation and Test Development. Corresponding email: luluk@unu-jogja.ac.id

Berli Arta holds a bachelor's degree in English Language Education from Universitas Ahmad Dahlan Yogyakarta and his master's degree in TESOL from Monash University. He is now an active lecturer at Universitas Nahdlatul Ulama Yogyakarta. His expertise is in English Language Teaching Methodology and speaking. Corresponding email: berli@unu-jogja.ac.id

REFERENCES

Aarset, M. V., & Johannessen, L. K. (2022). On distributed cognition while designing an AI system for adapted learning. *Frontiers in Artificial Intelligence*, *5*(July), 1–15. https://doi.org/10.3389/frai.2022.910630

AbuSahyon, A. S. E., Alzyoud, A., Alshorman, O., & Al-Absi, B. (2023). AI-driven technology and chatbots as tools for enhancing English Language Learning in the context of second language acquisition: A review study. *International Journal of Membrane Science and Technology*, *10*(1), 1209–1223. https://doi.org/10.15379/ijmst.v10i1.2829

Bachman, F. (2020). Another generation of fundamental considerations in language assessment. In *Another Generation of Fundamental Considerations in Language Assessment*. 1-256. https://doi.org/10.1007/978-981-15-8952-2

Carrillo Cruz, C. E., Ramos Garzón, F., & Gutierrez, H. (2023). Inclusive education strategies for the EFL teaching context. *Revista Boletín Redipe*, *12*(11), 53–62. https://doi.org/10.36260/rbr.v12i11.2040

Chong, S. W., & Reinders, H. (Eds.). (2023). *Innovation in learning-oriented language assessment*. 28(4). Palgrave Macmillan. https://doi.org/10.55593/ej.28112r3

Dr Shaheen Parveen, & Shaikh Imran Ramzan. (2024). The role of digital technologies in education: Benefits and challenges. *International Research Journal on Advanced Engineering and Management (IRJAEM)*, *2*(06), 2029–2037. https://doi.org/10.47392/irjaem.2024.0299

Halkiopoulos, C., & Gkintoni, E. (2024). Leveraging AI in E-Learning: Personalized learning and adaptive assessment through cognitive neuropsychology—A systematic analysis. *Electronics (Switzerland)*, *13*(18). https://doi.org/10.3390/electronics13183762

Hameed, F., Qayyum, A., & Khan, F. A. (2024). A new trend of learning and teaching: Behavioral intention towards mobile learning. In *Journal of Computers in Education* (Vol. 11, Issue 1). P.149-180. Springer Berlin Heidelberg. https://doi.org/10.1007/s40692-022-00252-w

Hayati, N., Muthmainah, & Wulandari, R. (2022). Children's online cognitive learning through integrated technology and hybrid learning. *JPUD - Jurnal Pendidikan Usia Dini*, *16*(1), 116–132. https://doi.org/10.21009/jpud.161.08

Hussain, T., Yu, L., Asim, M., Ahmed, A., & Wani, M. A. (2024). Enhancing E-Learning adaptability with automated learning style identification and sentiment analysis: A hybrid deep learning approach for smart education. *Information (Switzerland)*, *15*(5). https://doi.org/10.3390/info15050277

Kunnan, A. J. (2017). Evaluating language assessments. In *Evaluating Language*

Assessments. Routledge. p. 1-294. https://doi.org/10.4324/9780203803554

Li, X. (2024). A personalized teaching system for college English based on big data and artificial intelligence. *Scalable Computing: Practice and Experience*, *25*(6), 5477–5485. https://doi.org/10.12694/scpe.v25i6.3341

Martínez-Comesaña, M., Rigueira-Díaz, X., Larrañaga-Janeiro, A., Martínez-Torres, J., Ocarranza-Prado, I., & Kreibel, D. (2023). Impact of artificial intelligence on assessment methods in primary and secondary education: Systematic literature review. *Revista de Psicodidáctica (English Ed.)*, *28*(2), 93–103. https://doi.org/10.1016/j.psicoe.2023.06.002

Mathai, A. (2024). *Enhancing education for underprivileged children through AI-powered native language learning inclusive education through AI-powered native language learning*. http://dx.doi.org/10.2139/ssrn.4899553

McDonald, N., Johri, A., Ali, A., & Hingle, A. (2024). Generative artificial intelligence in higher education: evidence from an analysis of institutional policies and guidelines. *Computers in Human Behavior: Artificial Humans*, *3*(January), 100121. https://doi.org/10.1016/j.chbah.2025.100121

Mijwil, M. M., Ali, G., & Sadıkoğlu, E. (2023). The evolving role of artificial intelligence in the future of distance learning: Exploring the next frontier. *Mesopotamian Journal of Computer Science*, 98–105. https://doi.org/10.58496/mjcsc/2023/012

Mohebbi, A. (2025). Enabling learner independence and self-regulation in language education using AI tools: a systematic review. *Cogent Education*, *12*(1). https://doi.org/10.1080/2331186X.2024.2433814

Molenaar, I., Mooij, S. de, Azevedo, R., Bannert, M., Järvelä, S., & Gašević, D. (2023). Measuring self-regulated learning and the role of AI: Five years of research using multimodal multichannel data. *Computers in Human Behavior*, *139*(May 2022). https://doi.org/10.1016/j.chb.2022.107540

Moussa, N., Bentoumi, R., & Saali, T. (2024). Promoting student success with neutrosophic sets: Artificial intelligence and student engagement in higher education context. *International Journal of Neutrosophic Science*, *23*(1), 238–248. https://doi.org/10.54216/IJNS.230121

Narciso, P. (2024). Generative AI in education: A guide for parents and teachers. In *Generative AI in Education: A Guide for Parents and Teachers*. Apress Berkeley, CA.p.1-170.https://doi.org/10.1007/979-8-8688-0844-9

Rahmi, I., Damra, H. R., Desvianti, E., & Dalimunthe, H. L. (2024). Strategies for successful implementation of inclusive education in Indonesia: A review. *In Trend : International Journal of Trends in Global Psychological Science and Education*, *1*(3), 30–36. https://doi.org/10.62260/intrend.v1i3.170

Robiyansah, I. E., Mudjito, M., & Murtadlo, M. (2020). The development of inclusive education management model: Practical guidelines for learning in inclusive school. *Journal of Education and Learning (EduLearn)*, *14*(1), 80–86. https://doi.org/10.11591/edulearn.v14i1.13505

Salas-Pilco, S. Z., Xiao, K., & Oshima, J. (2022). Artificial intelligence and new technologies in inclusive education for minority students: A systematic review. *Sustainability (Switzerland)*, *14*(20), 1–17. https://doi.org/10.3390/su142013572

Sandoval Mena, M., & Waitoller, F. R. (2025). Students as agents of school change for inclusive education: international approaches and methodological pluralism. *International Journal of Qualitative Studies in Education*, *38*(3), 331–337. https://doi.org/10.1080/09518398.2025.2455981

Subandi, U., & Us, S. (2024). *Integrasi teknologi AI dalam pembelajaran STEM di Sekolah menengah kejuruan*[Integration of AI technology in STEM learning in vocational high schools]. *Bilangan: Jurnal Ilmiah Matematika, Kebumian Dan Angkasa*, *2*(6), 89–104. https://doi.org/10.62383/bilangan.v2i6.320

Taşçı, S., & Tunaz, M. (2024). Opportunities and challenges in AI-assisted language teaching: Perceptions of pre-service EFL teachers. *Araştırma ve Deneyim Dergisi*, *9*(2), 74–83. https://doi.org/10.47214/adeder.1575897

Umar, U. (2024). Advancements in English language teaching: Harnessing the power of artificial intelligence. *FLIP Foreign Language Instruction Probe*, *3*(1), 29–42. https://doi.org/10.54213/flip.v3i1.402

Woodcock, S., Sharma, U., Subban, P., & Hitches, E. (2022). Teacher self-efficacy and inclusive education practices: Rethinking teachers' engagement with inclusive practices. *Teaching and Teacher Education*, *117*, 103802. https://doi.org/10.1016/j.tate.2022.103802

Wu, X., Zhu, S., Zhou, J., & Yao, R. (2024). Paradigm shift in foreign language teaching practices in the age of AI - case studies of Chinese and Japanese learners. *2024 IEEE Cyber Science and Technology Congress (CyberSciTech)*, 496–501. https://doi.org/10.1109/CyberSciTech64112.2024.00088