AI-POWERED PERSONALIZED LEARNING IN EFL ACQUISITION: EXPLORING ADAPTIVE INSTRUCTION AND FEEDBACK SYSTEMS

Abdelkrim Dekhakhena [1]
8 May 1945 Guelma University (Algeria)
dekhakhena.abdelkrim@univ-guelma.dz

Abstract: The integration of Artificial Intelligence (AI) in English as a Foreign Language (EFL) instruction is revolutionizing traditional approaches by offering personalized learning experiences. This study investigates the potential of AI-powered adaptive learning systems to enhance EFL acquisition, focusing on how these technologies and deliver individualized learning pathways and deliver real-time feedback. By examining AI-driven platforms that analyze student performance in areas such as grammar, pronunciation, and writing, this research evaluates their effectiveness in improving language fluency and retention compared to conventional teaching methods. Additionally, it addresses the pedagogical and ethical implications of AI in the classroom, including the balance between AI automation and the irreplaceable role of human educators. The study aims to provide a comprehensive understanding of how adaptive instruction, supported by AI, can transform EFL education and facilitate more tailored and efficient language acquisition.

Keywords: Adaptive Learning Systems, Artificial Intelligence (AI), EFL Acquisition, Language Learning Technologies, Personalized Learning, Real-Time Feedback

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[1] **Corresponding author:** Abdelkrim Dekhakhena **ORCID ID: https://orcid.org/0000-0003-0354-9130**

1. Introduction

The rapid advancements in artificial intelligence (AI) over recent years have revolutionized various sectors, including education. AI's integration into language learning, particularly English as a Foreign Language (EFL) acquisition, has become an area of growing interest among researchers and educators. Traditional EFL teaching methods, which often rely on instructor-led lessons, textbooks, and static learning materials, face challenges in addressing the diverse needs of learners in a globally connected, fast-paced world. In contrast, AI offers personalized, adaptive, and interactive learning experiences that can significantly enhance the language acquisition process.

AI-powered tools such as intelligent tutoring systems, virtual assistants, and adaptive learning platforms provide learners with real-time feedback, tailored content, and greater autonomy. These technologies enable a more individualized learning journey, making it possible to cater to students' unique learning styles, paces, and needs. For instance, platforms that utilize AI can adjust the difficulty of lessons, provide pronunciation assistance, or generate grammar corrections based on continuous monitoring of student performance. Such innovations are especially relevant in the EFL context, where mastery of pronunciation, vocabulary, and grammar can be challenging and require immediate feedback and personalized practice.

The emergence of AI in education reflects a paradigm shift, emphasizing the need for efficiency and personalization in language instruction. However, the adoption of these technologies also raises important questions about the changing role of teachers, ethical concerns regarding data privacy, and the potential for AI to either complement or overshadow traditional pedagogical approaches.

Traditional EFL teaching methods rely heavily on instructor-led lessons and static materials, which fail to accommodate learners' diverse needs and paces. While recent advancements in language education technologies offer potential solutions, many classrooms still follow a one-size-fits-all approach. This research investigates how AI-powered adaptive learning systems can bridge this gap by providing real-time feedback and personalized learning experiences.

Despite the advancements in language education technologies, traditional EFL teaching methods often fail to address the diverse needs and learning paces of individual students. Many learners encounter difficulties in language acquisition due to a one-size-fits-all approach, which does not account for their unique strengths, weaknesses, and learning preferences (Dörnyei, 2005). As a result, there is a pressing need for more personalized and efficient language learning methods that leverage technology to support learners in overcoming challenges.

Recent research indicates that personalized learning, particularly when supported by AI-driven tools, can significantly improve student outcomes, engagement, and retention rates. For example, a 2022 study by He and Zhu found that AI-powered adaptive learning systems increased vocabulary retention by 25% compared to traditional methods. Similarly, Hwang and Chang (2021) demonstrated that real-time feedback from AI platforms improved speaking fluency by 30% among intermediate EFL learners. These findings underscore the importance of adopting innovative approaches in EFL instruction, particularly in addressing the diverse needs of learners in a globally connected world.

1.1 Research Objectives

This study investigates the transformative role of Artificial Intelligence (AI) in enhancing English as a Foreign Language (EFL) learning, with a focus on adaptive learning pathways, real-time feedback, and learner autonomy. It explores how AI technologies are reshaping traditional EFL instruction by offering personalized and interactive experiences. Specifically, the research compares AI-driven methods with conventional teaching approaches to assess their effectiveness in improving grammar, vocabulary acquisition, and speaking fluency.

This study seeks to answer three key questions:

1.   How do AI-driven platforms compare to traditional methods in improving grammar, vocabulary, and speaking fluency among EFL learners?

2.   To what extent does real-time AI feedback enhance learner autonomy and motivation?

3.   What ethical challenges emerge when implementing AI tools in culturally diverse Algerian classrooms?

By addressing these questions, the research aims to inform educators and policymakers about the potential of AI to enrich EFL pedagogy while highlighting both its pedagogical benefits and ethical implications.

1.2 Significance of the Study

The significance of this study lies in its potential to inform educators and policymakers about the transformative impact of Artificial Intelligence (AI) on English as a Foreign Language (EFL) education. By demonstrating how AI-driven platforms can enhance the learning process and improve student outcomes, this research aims to contribute to the ongoing dialogue about integrating technology into language instruction. Specifically, the study seeks to highlight the benefits of adaptive learning pathways and real-time feedback in fostering personalized, efficient, and engaging learning experiences.

Furthermore, this research underscores the implications of AI for educators, including potential shifts in teaching methodologies and the need for professional development to effectively leverage these technologies. As the educational landscape continues to evolve with rapid technological advancements, understanding how to harness AI's capabilities will be critical for creating dynamic, responsive, and learner-centered EFL environments. By providing actionable insights, this study aims to support the development of strategies that ensure equitable access to AI-enhanced learning tools, ultimately benefiting learners and educators worldwide.

2. Literature Review

The integration of Artificial Intelligence (AI) in education has advanced significantly over the past decade, driven by developments in machine learning (ML) and natural language processing (NLP). These technologies have enabled the creation of sophisticated language-learning platforms that offer personalized instruction and real-time feedback (Hwang & Chang, 2021). AI-powered platforms such as Duolingo, Babbel, and Replika leverage adaptive learning algorithms to dynamically adjust content based on learner performance. These tools provide individualized learning experiences, including grammar correction, pronunciation assistance, and conversational practice (Miao, Zhang, & Wang, 2021; Hwang & Chang, 2021). Their ability to tailor instruction enhances engagement and accelerates language acquisition.

Despite these advancements, critical challenges remain. One of the most pressing issues is algorithmic bias, where AI systems may favor certain dialects or accents, disadvantaging learners from diverse linguistic backgrounds (Liu & He, 2020). This bias can lead to inequitable learning experiences, as students with non-standard accents may receive inaccurate feedback or struggle with AI recognition systems.

2.1 Theoretical Background

2.1.1 AI in language learning: foundations and theoretical perspectives

Artificial Intelligence (AI) has become an integral component of educational technology, revolutionizing teaching and learning across various disciplines, including English as a Foreign Language (EFL) acquisition. AI applications such as natural language processing (NLP), machine learning, and data analytics have enabled the development of personalized learning tools that cater to individual learner needs. AI-driven platforms align with Vygotsky's Sociocultural Theory (1978), which underscores the importance of scaffolding in language acquisition. Studies show that AI applications like chatbots and adaptive learning models serve as digital scaffolds, offering tailored support at each learner's proficiency level (González-Lloret, 2016).

For instance, AI-powered platforms like Duolingo utilize adaptive algorithms to modify lesson difficulty based on learner performance, thereby creating personalized learning pathways (Vesselinov & Grego, 2016). This adaptability aligns with Vygotsky's Sociocultural Theory, which emphasizes the role of scaffolding and mediated learning in language acquisition (Vygotsky, 1978). AI acts as a dynamic scaffolding tool, providing real-time feedback and adjusting to the learner's Zone of Proximal Development (ZPD)—a concept that highlights the importance of guided instruction in skill development.

Additionally, Krashen's Input Hypothesis supports AI-driven feedback as a means of enhancing comprehensible input, a crucial factor in second language acquisition (Krashen, 1982). AI-powered chatbots, such as those integrated into language learning apps, facilitate conversational practice and exposure to authentic language use, mimicking real-world interactions (González-Lloret, 2016). This growing integration of AI underscores its potential to enhance learner engagement, efficiency, and autonomy in EFL learning environments.

2.1.2 Evolution of EFL instruction: From traditional approaches to AI integration

Historically, EFL instruction relied on traditional methods such as the Grammar-Translation Method and the audio-visual approach, both of which emphasized rote memorization and repetitive drills (Richards & Rodgers, 2014). While these methods provided a structured foundation, they often failed to develop communicative competence or encourage authentic language use. The late 20th century saw the emergence of Communicative Language Teaching (CLT), which shifted the focus toward interactive, student-centered learning and real-world communication skills (Littlewood, 2004). This approach emphasized fluency over accuracy and encouraged learners to engage in meaningful language exchanges.

With advancements in technology, modern EFL instruction has increasingly integrated digital tools such as multimedia resources, online learning platforms, and mobile applications. Research suggests that technology-enhanced learning environments boost learner motivation and improve authentic communication skills, aligning closely with CLT principles (Blaschke, 2012; Godwin-Jones, 2018). Recent work by Sebbah (2025) and Alafnan (2025) underscores the need for AI tools to incorporate culturally relevant content for Algerian learners, such as local dialects (e.g., Darja) in conversational practice, to enhance engagement and contextual learning.

Given these developments, AI represents the next stage in EFL instruction, further enhancing personalization, interactivity, and adaptive learning to meet diverse learner needs.

2.1.3 AI in education: From rule-based systems to adaptive learning technologies

The application of AI in education has evolved significantly, transitioning from early rule-based systems to advanced machine learning algorithms capable of processing large-scale learner data (Luckin et al., 2016). Early AI-based tutoring systems followed predefined scripts, offering limited flexibility in adapting to individual learner needs.

However, the advancements in NLP and deep learning have led to the development of sophisticated AI-driven applications that dynamically adjust content based on learner performance. For example, Rosetta Stone and Busuu utilize AI algorithms to analyze learner progress and customize instruction, while Versant, an AI-driven assessment tool, employs speech recognition to provide real-time feedback on pronunciation and fluency (Wang et al., 2024). These applications demonstrate AI's capacity to enhance language learning through data-driven, personalized instruction.

2.1.4 AI-driven adaptive learning systems: Key platforms and technologies

AI-driven adaptive learning systems are revolutionizing EFL instruction by using sophisticated algorithms to personalize educational content. Platforms like Duolingo, Lingvist, and Babbel dynamically adjust material difficulty based on learner performance (Vesselinov & Grego, 2016; Karpicke & Grimaldi, 2012), ensuring optimal challenge levels. Duolingo enhances engagement through gamification, while Replika's AI chatbots offer conversational practice with instant feedback. For writing development, tools like Grammarly leverage natural language processing to provide real-time grammar and style corrections. Together, these technologies create a responsive learning ecosystem that adapts to individual needs, making language acquisition more efficient and engaging. These adaptive technologies empower learners by customizing their learning experiences, fostering greater autonomy, and improving engagement and retention.

2.1.5 Real-Time feedback: AI's role in personalized language acquisition

AI significantly enhances EFL instruction through real-time, personalized feedback, accelerating language acquisition by enabling immediate error correction (Shute, 2008). Automated Writing Evaluation (AWE) systems like Grammarly analyze grammar and coherence (Attali & Burstein, 2006), while AI speech tools such as SpeechAce assess pronunciation and fluency. These technologies provide targeted support, helping learners refine both written and spoken English efficiently. By delivering instant, tailored corrections, AI tools reinforce accurate language use and promote independent learning, making them invaluable assets in modern EFL classrooms.

Studies show that timely feedback significantly boosts learner motivation and confidence, leading to greater language proficiency (Hattie & Timperley, 2007). AI's ability to provide immediate, data-driven insights represents a transformative shift in EFL education, supporting learners in achieving fluency more efficiently. Zhang & Pérez-Paredes (2023) demonstrated that AI-generated feedback improves grammatical accuracy by 22% compared to delayed human feedback, supporting our findings on immediate error correction.

The integration of AI in EFL instruction represents a paradigm shift from static, one-size-fits-all teaching methods to dynamic, personalized learning environments. AI's adaptive capabilities, rooted in theoretical models such as Vygotsky's ZPD and Krashen's Input Hypothesis, facilitate tailored instruction that aligns with individual learner needs. By offering real-time feedback, adaptive content, and interactive learning experiences, AI-driven

platforms enhance learner engagement, motivation, and autonomy (Guan, Li & Gu, 2024). As AI continues to evolve, its role in transforming language education will likely expand, making personalized and data-driven learning an integral part of EFL instruction.

2.2 Research Gap

While AI-driven platforms have demonstrated effectiveness in adaptive learning, there is still limited research on their inclusivity and fairness in diverse EFL contexts. Existing studies primarily focus on learning outcomes rather than how AI biases affect learners from different linguistic and cultural backgrounds. Therefore, further research is needed to:

1. Evaluate the fairness of AI-driven language learning tools across various learner profiles.

2. Develop more inclusive AI models that account for diverse accents and linguistic variations.

3. Investigate the long-term impact of AI-generated feedback on language proficiency and learner autonomy.

Addressing these gaps is essential for ensuring that AI-enhanced EFL instruction remains equitable, effective, and accessible to all learners worldwide.

3. Methodology

3.1 Context

This study employs a comparative analysis design to evaluate the effectiveness of AI-driven platforms in enhancing EFL acquisition compared to traditional teaching methods. The research will focus on two distinct groups: one using AI-assisted learning tools (e.g., Duolingo, Babbel, and Grammarly) and the other relying on conventional classroom instruction (e.g., teacher-led lessons, textbooks). This design allows for a systematic comparison of learner outcomes, engagement levels, and overall satisfaction with the learning process.

To facilitate this comparison, the research will establish specific learning objectives, such as improving vocabulary acquisition, speaking fluency, grammatical structures, and writing skills. By utilizing pre- and post-intervention assessments, the study aims to measure the impact of each instructional approach on student performance. For instance, vocabulary and grammar tests, speaking assessments, and writing evaluations are administered before and after the intervention period to gauge progress.

3.2 Participants

The study involves two distinct groups of participants: EFL learners and EFL educators.

EFL Learners: The study included 100 EFL learners enrolled in English LMD courses at the Department of Literature and English Language, 8 May 1945 Guelma University. Participants were first assessed using a standardized placement test (CEFR-aligned) to determine their proficiency levels, resulting in the following distribution: 30 beginners (L1/CEFR A1-A2), 50 intermediate learners (L2/CEFR B1-B2), and 20 advanced learners (L3/CEFR C1). Culturally, the sample represented Algeria's diversity with 65 Arab students, 30 Amazigh students, and 5 students from other ethnic backgrounds, drawn from 15 different study groups at the department.

Participants were randomly assigned to either:

1. An AI-assisted learning group (n=50) that used platforms including Duolingo (25 students), Babbel (15 students), and Grammarly (10 students), or

2. A traditional teaching group (n=50) that received conventional classroom instruction (see table 1).

To ensure validity, strict inclusion criteria were applied. Both groups underwent identical pre-intervention proficiency assessments, confirming baseline equivalence ($p > .05$). The AI-assisted group (n=50) additionally verified reliable internet access and device compatibility. Participants were matched by proficiency (15 L1, 25 L2, 10 L3) and cultural representation (AI group: 32 Arab, 15 Amazigh, 3 other; traditional group: 33 Arab, 15 Amazigh, 2 other). Pre-intervention assessments controlled for prior language proficiency and technological access, ensuring only qualified students were included in the AI group. This design maintained group comparability while accounting for critical variables.

EFL Educators: To enrich the research findings, the study gathered insights from 10 experienced EFL instructors proficient in both traditional and AI-driven teaching methodologies. These educators offered valuable perspectives on three key areas: the practical implementation of each instructional approach, their observations regarding student engagement and learning outcomes across both methods, and the specific challenges and opportunities encountered when integrating AI tools into EFL classrooms. Their professional experiences provided crucial context for interpreting the study's quantitative data, while also highlighting real-world considerations for adopting AI-enhanced language instruction.

By including both learners and educators, the study aims to provide a comprehensive understanding of the impact of AI on EFL education, considering both the learner experience and the instructor's role in facilitating effective learning environments.

Table 1:

Demographic Distribution and Platform Usage Across Experimental Groups

Characteristic	AI Group (n=50)	Traditional Group (n=50)
Proficiency	/	/
L1 (A1-A2)	15	15
L2 (B1-B2)	25	25
L3 (C1)	10	10
Cultural Background	/	/
Arab	32	33
Amazigh	15	15
Other	3	2
Platform Usage	/	/
Duolingo	25	N/A
Babbel	15	N/A
Grammarly	10	N/A

3.3 Data Collection

Data collection follows a multi-faceted approach to gather both quantitative and qualitative data, ensuring a comprehensive evaluation of the two instructional methods. Semi-structured interviews were conducted with participating educators to explore their experiences with AI-driven and traditional teaching approaches. These interviews focus on key aspects

such as student engagement, perceived effectiveness, and implementation challenges. For example, teachers might be asked, "How do you perceive student engagement when using AI tools compared to traditional methods?" Their responses provide valuable insights into the practical advantages and limitations of each approach.

Student surveys were also administered to capture learners' perspectives on their experiences. These surveys include Likert-scale questions assessing satisfaction, perceived learning gains, and motivation levels. A sample question might be, "On a scale from 1 to 5, how satisfied are you with the feedback provided by the AI platform?" This quantitative feedback helps gauge student preferences and the perceived effectiveness of each method. Additionally, for the AI-assisted learning group, platform analytics were collected to track engagement levels, completion rates, and performance metrics. These data points reveal how frequently students interact with the platform and their progression through the material.

To measure learning outcomes, pre- and post-intervention assessments were administered, evaluating four core competencies: grammar, vocabulary, speaking, and writing. These assessments align with the study's predefined learning objectives, ensuring consistency in measuring progress. Throughout the data collection process, participant anonymity and data security were prioritized. Identifiers were replaced with alphanumeric codes, and only essential data was collected with explicit consent, adhering to ethical research standards. This rigorous approach ensures reliable and meaningful results while safeguarding participant confidentiality.

3.4 Procedures

The data analysis will incorporate both quantitative and qualitative methods to ensure a thorough understanding of the research findings. For the quantitative aspect, statistical tests such as paired t-tests or ANOVA will be used to compare pre- and post-intervention scores between the two groups. This analysis will reveal whether there are statistically significant differences in learner performance based on the instructional method. For example, if the AI-driven group demonstrates a greater improvement in vocabulary retention compared to the traditional group, this finding will be emphasized in the results.

Qualitative data from teacher interviews and student surveys will be analyzed using thematic analysis. This process involves coding the responses to identify recurring themes and patterns. For instance, if multiple educators note increased student motivation when using AI tools, this theme will be documented and further explored in the discussion section. The qualitative insights will provide depth to the numerical data, offering a clearer picture of the participants' experiences and perceptions.

Finally, the study will integrate the findings from both the statistical and qualitative analyses to present a comprehensive evaluation of AI-driven platforms versus traditional methods. This combined approach will highlight not only the measurable outcomes but also the subjective experiences of learners and educators, ensuring a well-rounded interpretation of the results.

3.5 Intervention Design and Assessment Framework

This study employed a controlled eight-week intervention comparing AI-assisted and traditional learning conditions. Both groups received identical curricular content aligned with Algeria's national EFL standards, covering four core competencies: grammar, vocabulary, speaking, and writing. The AI-assisted group (n=50) supplemented classroom instruction with three 45-minute weekly sessions using prescribed platforms: Duolingo for grammar and vocabulary (gamified exercises), Babbel for speaking (voice recognition drills), and

Grammarly for writing (real-time feedback). The traditional group (n=50) engaged in equivalent time with textbook exercises, teacher-led drills, and peer review sessions.

The assessment protocol involved pre- and post-intervention testing using parallel-form instruments to assess language proficiency. The grammar test was a 30-item discrete-point test measuring accuracy in verb tense consistency, article usage, and sentence structure. The vocabulary test was a 50-item computer-adaptive test from the Academic Word List. The speaking assessment was a two-part, 5-minute monologue (IELTS Task 2 format) and a 10-item pronunciation test using Praat software. The writing assessment was a timed argumentative essay, evaluating grammar accuracy, lexical diversity, cohesion/coherence, and task achievement.

3.6 Limitations of the Study

While this study provides valuable insights into the effectiveness of AI-driven platforms in EFL learning, several limitations should be acknowledged. First, the research was conducted with a specific group of university students, which may limit the generalizability of the findings to other educational contexts, such as K -12 or adult education. Second, the reliance on self-reported data (e.g., student surveys) introduces the potential for response bias, as participants may overstate their satisfaction or learning gains. Additionally, the study focused on short-term outcomes, such as immediate improvements in grammar and pronunciation, but did not explore the long-term impact of AI tools on language retention or fluency. Future research should address these limitations by conducting longitudinal studies and incorporating objective performance metrics alongside self-reported data.

4. Results

4.1 Feedback Summary from EFL Students

The feedback collected from 100 EFL students enrolled in university courses reveals a diverse range of experiences with both AI-driven platforms and traditional teaching methods. The students provided insights into their satisfaction, perceived learning gains, and motivation, highlighting the strengths and weaknesses of each approach.

Table 2:

Student Satisfaction with AI Platforms (n=50)

Feedback Category	Response Options	Percentage of Students (%)
Satisfaction with AI Platforms	1 (Very Unsatisfied)	5%
	2 (Unsatisfied)	10%
	3 (Neutral)	15%
	4 (Satisfied)	40%
	5 (Very Satisfied)	30%
Usefulness of Real-Time Feedback	1 (Very Unhelpful)	5%
	2 (Unhelpful)	10%
	3 (Neutral)	20%
	4 (Helpful)	35%
	5 (Very Helpful)	30%
Perceived Learning Gains	1 Significant Progress	60%
	2 Moderate Progress	30%
	3 No Significant Progress	10%

The feedback from EFL students indicates a generally positive reception of AI-driven platforms, with many students experiencing enhanced engagement and perceived learning gains. While traditional teaching methods remain valuable, integrating AI tools may offer additional support in creating a more personalized and effective learning environment for EFL learners.

4.1.1 Satisfaction with Instructional Approaches

Overall, students expressed a high level of satisfaction with the AI-driven platforms. Approximately 70% of respondents rated their satisfaction with the overall learning experience provided by AI platforms as 4 or 5 on a Likert scale. Common themes included an appreciation for the interactive nature of the platforms and the gamified learning experience, which many found engaging. In contrast, satisfaction with traditional teaching methods was slightly lower, with only about 55% rating their experience as 4 or 5. Many students appreciated the structured environment of traditional classes but noted a lack of individualized attention.

4.1.2 Feedback from AI platforms

Students indicated that they found the feedback provided by AI platforms to be immediate and useful. On a 5-point Likert scale, about 65% rated their satisfaction with the feedback as 4 or 5. Many students reported that the timely feedback helped them identify and

correct their mistakes, enhancing their learning process. However, some students (about 25%) noted that they desired more detailed explanations and specific guidance to complement the automated feedback.

4.1.3 Perceived learning gains

When asked about their perceived improvement in English skills, 60% of students felt they had made significant or exceptional progress while using the AI platforms. Many cited improvements in vocabulary retention and speaking fluency as major areas of growth. Comparatively, 50% of students reported similar levels of improvement through traditional methods, suggesting that while both approaches can be effective, AI tools may offer additional benefits for some learners.

Table 3:

Comparison of Learning Outcomes

Outcome Measure	Traditional Methods	AI-Driven Methods
Overall Satisfaction	55% (4 or 5 on the Likert Scale)	70% (4 or 5 on the Likert Scale)
Significant Learning Gains	50%	60%
Improvement in Pronunciation	40%	70%
Improvement in Grammar	45%	75%
Improvement in Writing Skills	50%	65%

4.1.4 Motivation and engagement

Motivation levels varied among students, with about 75% stating they felt very or extremely motivated to practice English using AI platforms. Many students expressed that the gamified elements of the platforms made learning enjoyable and encouraged them to practice more frequently. In contrast, motivation for traditional methods was lower, with only 45% feeling very or extremely motivated, often due to the more rigid structure of classroom learning.

Table 4:

Learner Autonomy and Motivation

Aspect	AI-Driven Methods	Traditional Methods
Student Motivation	Very High (75%)	Moderate (45%)
Student Autonomy	High (80%)	Low (30%)
Student Engagement	Very High (80%)	Moderate (50%)

4.1.5 Open-ended feedback

Students highlighted several benefits of AI systems in EFL learning, particularly their flexibility in allowing self-paced study and 24/7 resource access. They also appreciated the interactive elements, such as gamified activities, that make learning engaging, along with the convenience of mobile apps for on-the-go practice. However, learners suggested key improvements, including enhanced interactivity through more speaking and conversational practice features, as well as the integration of cultural components to deepen language comprehension. Researchers Hu (2024) and Hooshyar et al. (2024) support these findings, emphasizing the growing demand for AI systems that deliver truly personalized learning experiences tailored to individual progress and skill gaps.

4.2 Feedback Summary from EFL Instructors

The feedback gathered from 10 experienced EFL instructors provides valuable insights into the implementation and effectiveness of both traditional and AI-driven teaching methods. These educators, with varied backgrounds in language instruction, shared their experiences and observations regarding student engagement and learning outcomes.

4.2.1 Implementation of teaching methods

All instructors reported that integrating AI-driven platforms into their teaching has required a shift in their instructional strategies. They emphasized the need for adequate training to effectively use these technologies. While traditional methods often involve structured lesson plans and direct teacher-led instruction, the AI platforms introduced a more flexible and interactive approach.

Instructors noted that traditional methods, characterized by lectures, group discussions, and standardized assessments, provide a familiar structure that many students appreciate. However, they acknowledged that these methods can sometimes limit student participation and engagement, particularly among less confident learners. Conversely, instructors highlighted the versatility of AI-driven platforms, noting that they facilitate personalized learning pathways and allow for differentiated instruction. They reported that AI tools can adapt to individual students' needs, making it easier to address varying proficiency levels within the same classroom.

Table 4:

Instructor Observations on Teaching Methods

Teaching Method	Observation	Percentage of Instructors (%)
Traditional Methods	High Student Engagement	40%
	Moderate Student Engagement	50%
	Low Student Engagement	10%
AI-Driven Methods	High Student Engagement	80%
	Moderate Student Engagement	20%
	Low Student Engagement	0%
Effectiveness of AI Feedback	Not Effective	10%
	Somewhat Effective	20%
	Effective	70%

4.2.2 Perceptions of student engagement

Instructors observed significant differences in student engagement between the two approaches. While some students thrived in a structured classroom environment, others were less engaged, particularly during longer lectures. Instructors noted that students often became passive participants, relying heavily on the teacher for information. In contrast, instructors unanimously reported higher levels of engagement when using AI platforms. Many students actively participated in gamified activities and interactive exercises, which fostered a sense of autonomy and motivation. One instructor noted, "Students who previously struggled to participate in discussions were much more willing to engage with the AI tools."

4.2.3 Learning Outcomes

When discussing the learning outcomes, instructors shared varied perspectives based on their observations. Instructors acknowledged that while traditional methods can yield positive learning outcomes, they often depend on the effectiveness of the individual instructor's

teaching style. Several educators emphasized the importance of student-teacher interaction in enhancing comprehension and retention. Quite the reverse, most instructors reported that students using AI platforms demonstrated notable improvements in specific language skills, particularly in vocabulary acquisition and pronunciation. One instructor remarked, *"The immediate feedback from AI tools has helped students correct their errors in real-time, for language learning which is incredibly beneficial."*

4.2.4 Challenges and Recommendations

While instructors were generally positive about the integration of AI-driven methods, they also highlighted several challenges. Technology Accessibility emerged as a key concern. Some educators pointed out that not all students have equal access to the technology needed to fully benefit from AI platforms, which can create disparities in learning opportunities. instructors suggested that a blended approach combining traditional and AI-driven methods could be most effective. They recommended maintaining the structure of traditional lessons while incorporating AI tools to enhance engagement and personalize learning. Additionally, instructors emphasized the need for ongoing professional development to help educators effectively integrate technology into their teaching practices.

The feedback from EFL instructors illustrates the potential benefits of AI-driven teaching methods in enhancing student engagement and learning outcomes. While traditional methods remain valuable, instructors advocate for a blended approach that leverages the strengths of both strategies. By providing students with personalized learning experiences and immediate feedback, AI tools can significantly contribute to the effectiveness of EFL instruction.

4.3   Feedback on Platform Analytics for AI-Assisted Learning Group

The data collected from AI-assisted learning platforms offered comprehensive insights into learner engagement, completion rates, and performance metrics, revealing how students interacted with the technology and progressed through EFL material. Engagement levels were notably high, with analytics showing students accessed the AI system 4-5 times weekly—some even daily. Adaptive, personalized content, particularly interactive exercises like AI chatbots and dynamic grammar quizzes, drove this consistent participation. Completion rates further demonstrated the platform's effectiveness: the AI group outperformed traditional methods, with 85% completing weekly lessons on time and 90% achieving overall completion. Gamification elements, such as badges and progress tracking, along with real-time feedback, significantly boosted motivation and goal attainment.

Performance metrics revealed substantial improvements, with AI learners increasing grammar scores by 20% compared to 12% in traditional settings. Speech recognition tools enhanced pronunciation clarity, while real-time feedback reduced recurring writing errors by 15%. Time-on-task data showed sessions averaged 45 minutes, with longer usage correlating to higher assessment scores, underscoring the value of sustained AI interaction. Additionally, 70% of learners utilized the platform's self-directed options to focus on weak areas, such as pronunciation, fostering greater autonomy, motivation, and independent study habits. Together, these findings highlight AI's transformative potential in EFL instruction..

Table 5 provides a concise summary of the platform analytics data and demonstrates the impact of AI on learner engagement, completion rates, performance, time management, and autonomy.

Table 5:

Platform Analytics for AI-Assisted Learning Group

Metric	Observation	Details
Engagement Levels	High frequency of interaction with the platform	- Students interacted 4-5 times per week on average. - Interactive exercises (chatbots, quizzes) enhanced engagement.
Completion Rates	Higher completion rates compared to traditional methods	- 85% of students completed weekly lessons on time. - Gamification elements (badges, progress tracking) contributed to a 90% lesson completion rate.
Performance Metrics	Significant improvement in language skills	- 20% improvement in grammar scores (AI group) vs. 12% (traditional group). - Pronunciation clarity and fluency improved through AI speech recognition exercises.
Time on Task	Effective time spent on the platform	- Average of 45 minutes per session. - Increased time on task correlated with higher post-assessment scores.
Learner Autonomy	AI-promoted self-directed learning	- Over 70% of students selected personalized learning paths based on AI suggestions. - Focused practice on weaker areas (e.g., pronunciation, writing).

4.4 Feedback on Performance Metrics

The pre- and post-intervention assessments provided clear insights into the impact of AI-driven learning on key EFL outcomes, including vocabulary retention, speaking fluency, and writing proficiency.

The post-intervention assessments showed a marked improvement in vocabulary retention. On average, students in the AI-assisted learning group retained 30% more vocabulary words compared to the traditional group. This improvement is attributed to the adaptive nature of the AI platform, which reinforced new words through personalized exercises and spaced repetition techniques.

The AI system's speech recognition and interactive chatbot features allowed students to practice speaking regularly with real-time feedback. As a result, students demonstrated a 25% improvement in speaking fluency based on post-intervention fluency assessments. The AI's immediate pronunciation corrections and suggestions for alternative phrasing contributed to the smoother and more confident delivery of the speech.

Significant gains were also observed in writing proficiency. Post-intervention essays and written exercises showed improvements in grammar accuracy, sentence structure, and overall coherence. The AI's real-time grammar and style suggestions led to a 20% reduction in grammatical errors and an improvement in the complexity of sentence construction. Students reported feeling more confident in their writing abilities, owing to the instant feedback provided by the platform.

Post-intervention testing demonstrated a 28% improvement in grammatical accuracy (M=85.3, SD=6.4) for the AI group versus 12% (M=72.1, SD=7.8) for the traditional group (p<.01). The AI platform's real-time error detection proved especially effective for: verb tense consistency (error reduction: 35%), article usage (error reduction: 27%), and complex sentence formation (error reduction: 22%).

Overall, the performance metrics demonstrate that AI-driven tools can substantially improve learner outcomes in critical areas of language acquisition, outperforming traditional methods in providing personalized, immediate support aligned with individual learning objectives. Table 6 provides a concise overview of the improvements observed in vocabulary retention, speaking fluency, and writing proficiency following the AI-assisted learning intervention.

Table 6:

Performance Metrics – Pre- and Post-Intervention Outcomes

Metric	Pre-Intervention Status	Post-Intervention (AI Group)	Improvement
Grammar Accuracy	Frequent errors in verb tenses, articles, and complex structures	28% improvement (M=85.3%)	largest AI advantage
Vocabulary Retention	Lower retention with inconsistent reinforcement	30% higher retention through personalized exercises and spaced repetition	Significant increase in retention
Speaking Fluency	Limited practice opportunities, minimal feedback	25% improvement due to real-time feedback and interactive chatbot practice	Enhanced fluency and confidence
Writing Proficiency	Frequent grammatical errors, basic sentence structure	20% reduction in grammatical errors, more complex sentence construction	Clear improvement in writing skills

4.5 Comparative Performance Outcomes

The study found that AI-assisted learning significantly improved grammar accuracy, vocabulary retention, speaking fluency, and writing proficiency compared to traditional methods. The AI group achieved a 28% improvement in grammar accuracy, 18 percentage points more in vocabulary retention, and a 25% improvement in speaking fluency. Writing proficiency saw a 20% reduction in grammatical errors, while lexical diversity gains were more substantial. These results demonstrate the effectiveness of AI in promoting active learning, boosting completion rates, and improving performance metrics. The platform analytics highlight the role of AI in enhancing the EFL learning experience by providing real-time feedback and a personalized learning environment. Despite the modest improvements, traditional methods still yield measurable improvements.

Table 7.

Comparative Performance Outcomes: AI-Assisted vs. Traditional Instruction

Metric	AI Group (Post-Intervention)	Traditional Group (Post-Intervention)	Improvement Difference	Statistical Significance
Grammar Accuracy	28% improvement (M=85.3, SD=6.4)	12% improvement (M=72.1, SD=7.8)	+16%	p<.01, d=1.2
Verb tenses	35% error reduction	18% error reduction	+17%	p<.05
Articles	27% error reduction	13% error reduction	+14%	p<.05
Vocabulary Retention	30% improvement	12% improvement	+18%	p<.01, d=0.9
Speaking Fluency	25% improvement	9% improvement	+16%	p<.01, d=1.1
Phonological errors	40% reduction	15% reduction	+25%	p<.001
Writing Proficiency	20% error reduction	14% error reduction	+6%	p=.03
Lexical diversity	+15%	+8%	+7%	p<.05

5. Discussion

The study reveals that AI-driven learning platforms significantly enhance the effectiveness of EFL instruction by offering personalized, adaptive learning experiences. Through real-time feedback and content tailored to individual needs, students demonstrated greater improvements in language skills compared to traditional methods. Platform analytics showed that students using AI-powered systems exhibited higher engagement levels, completion rates, and notable progress in grammar, pronunciation, and vocabulary retention. The ability to adjust learning pathways based on performance metrics allowed for targeted practice, accelerating progress and fostering learner autonomy. Overall, the findings highlight the transformative potential of AI in EFL education, making learning more interactive, efficient, and personalized.

5.1 Impact of AI on Personalized Learning Paths

AI has revolutionized the customization of learning paths in EFL education. By leveraging algorithms to assess learners' proficiency levels and preferences, AI-driven platforms deliver tailored content that aligns with individual needs. Approximately 70% of students reported that AI tools adapted well to their learning pace, providing content that matched their proficiency. Instructors observed that this personalization addressed diverse abilities within classrooms and encouraged deeper engagement with the material. For example, one instructor noted, "The ability of AI to modify lessons based on real-time assessments has been a game-changer for struggling learners."

5.2 Effectiveness of Real-Time Feedback

Real-time feedback, a key feature of AI-driven platforms, played a crucial role in improving language skills such as pronunciation, grammar, and writing. Around 65% of students expressed satisfaction with the feedback, emphasizing its role in helping them identify and correct errors promptly. Instructors corroborated this, noting significant progress in areas like pronunciation and grammar accuracy. One instructor remarked, "Students who were previously hesitant to speak are now practicing aloud more frequently, thanks to the instant feedback they receive on their pronunciation."

5.3 Comparison with Traditional Methods

The comparative analysis of AI-driven and traditional EFL teaching methods revealed that AI-based learning platforms significantly improved student outcomes. Learners using AI-assisted tools reported higher perceived learning gains, with 60% indicating significant or exceptional progress, compared to 50% in traditional classrooms. While conventional methods provided a structured approach to language learning, they often lacked the adaptability needed to engage students effectively.

AI-driven systems, on the other hand, offer personalized learning experiences, real-time feedback, and interactive exercises that cater to individual learning needs. Instructors observed increased enthusiasm and participation among students using AI tools, attributing this to the dynamic nature of AI-driven content and immediate corrective feedback. Moreover, AI-enabled platforms facilitated autonomous learning, allowing students to practice at their own pace. These findings suggest that a blended approach, integrating AI with traditional methods, can enhance student engagement, motivation, and overall learning efficiency in EFL education.

5.4 Learner Autonomy and Motivation

AI-driven platforms effectively fostered learner autonomy and motivation by encouraging students to take control of their language-learning journey. Approximately 75% of students reported increased motivation when using AI tools, attributing this to features such as gamified elements, adaptive learning pathways, and instant feedback. These interactive components made learning more engaging and helped sustain interest over time. Instructors also recognized the advantages of self-directed learning, particularly for students with varying confidence levels.

AI tools allow learners to progress at their own pace, reducing the anxiety often associated with classroom-based assessments. One instructor noted, "The shift towards self-directed learning has empowered students, making them more responsible for their own progress and more invested in their outcomes." This finding suggests that AI-driven learning environments not only enhance motivation but also cultivate independent learning habits, ultimately leading to improved long-term language acquisition and greater learner confidence. The observed increase in self-directed learning aligns with Mohebbi (2024) and Wang, Li, & Bonk (2024) meta-analysis, which found AI platforms boost autonomy by 40% through features like adaptive goal-setting. Both studies highlight the positive impact of AI in enhancing learner autonomy and supporting self-directed learning in educational contexts.

5.5 Ethical Considerations

The integration of AI in EFL instruction presents both transformative opportunities and significant ethical challenges that require careful consideration. Our research identifies three primary areas of concern that must be addressed to ensure equitable implementation: algorithmic bias, the digital divide, and data privacy protections.

The issue of algorithmic bias emerges most prominently in speech recognition systems, which frequently disadvantage non-native English speakers. Our findings reveal that Amazigh-speaking learners received 23% more pronunciation errors than their Arab peers (p=.02), echoing broader patterns of linguistic bias documented by Nguyen & Hajek (2022). This systemic bias stems from training datasets that inadequately represent global English varieties. To combat this, we propose a multi-pronged solution: (1) collaborative partnerships with Expert linguists to develop comprehensive regional accent databases, (2) implementation of accent-adaptive scoring algorithms, and (3) mandatory human verification for assessments

of marginalized dialects. These measures align with Mebarkia & Reffad's (2024) framework for equitable natural language processing in North African contexts.

Equally pressing is the digital divide that may exacerbate existing educational inequalities. As Hwang & Chang (2021) demonstrate, unequal access to technology disproportionately affects rural and low-income students. Policymakers must prioritize infrastructure development and device distribution programs to ensure all learners can benefit from AI-enhanced instruction. Our study's data protocols provide a paradigm for resolving privacy issues by including encrypted pseudonymization and tight data reduction criteria. These technology measures ensure study integrity while maintaining participant confidentiality.

The evolving role of educators in AI-enhanced classrooms requires particular attention. Contrary to replacement fears (Luckin et al., 2016), our findings support Nguyen et al.'s (2024) "hybrid scaffolding" model. In this framework, AI assumes responsibility for repetitive tasks like grammar drills and vocabulary practice while teachers focus on higher-order skills, including critical thinking, cultural pragmatics, and personalized feedback. When AI systems were unable to understand cultural norms, and human involvement was necessary to explain the cultural background of the refusal, the division of labor in Algerian communication became clear.

Table 7:

Ethical Considerations

Concern	Instructors' Perspective	Percentage of Instructors (%)
Data Privacy	Significant Concern	80%
Data Security	Important but Manageable	15%
Shift in Teacher Role	Positive Impact	50%
Need for Professional Development	Essential	70%

Moving forward, successful implementation will depend on three key strategies: First, ongoing bias testing and dataset diversification to improve AI's cultural responsiveness. Second, comprehensive teacher training programs that develop AI literacy and hybrid pedagogical skills (Hwang & Chang, 2021). Third, institutional policies that mandate regular ethical audits of educational AI systems. By addressing these challenges proactively, educators and policymakers can harness AI's potential while preserving the human elements that remain essential to quality language education.

5.6 Limitations

Four key limitations warrant consideration when interpreting our findings. First, the exclusive focus on Guelma University students may limit generalizability to Algeria's diverse educational landscape, particularly rural communities with distinct linguistic profiles. Second, the 8-week intervention period precluded the assessment of long-term retention effects, an important dimension given AI's potential for sustained adaptive learning. Third, while our sample included Arab and Amazigh learners, other ethnic English speakers were significantly underrepresented (5%) - a critical gap given their unique phonological challenges. Finally, the Hawthorne effect may have influenced results, as AI-group participants knew they were being observed, potentially inflating engagement metrics by 15-20%, according to instructor estimates. Future studies should incorporate longitudinal designs and more representative sampling to address these constraints.

6. Conclusion

The integration of AI in EFL education offers significant opportunities to enhance personalized learning, real-time feedback, and learner autonomy. This study demonstrates how AI-driven platforms create tailored experiences that improve language proficiency and engagement. Real-time feedback proves particularly effective, enabling students to promptly identify and correct errors, accelerating language acquisition. Additionally, AI tools boost motivation through interactive, gamified experiences that empower students to direct their own learning.

Educators should integrate AI to complement traditional methods, using adaptive systems to address diverse student needs. These tools can identify weaknesses and provide targeted exercises, allowing teachers to focus on complex or creative aspects of instruction. AI also aids in managing large classrooms by offering real-time feedback to enhance engagement. To maximize benefits, institutions must invest in teacher training programs that balance technological support with human interaction. However, ethical considerations—such as data privacy and the evolving role of teachers—must be addressed. Educators should preserve empathy and relational dynamics while leveraging AI's capabilities. A blended approach, combining AI's efficiency with traditional teaching's human touch, can create engaging and ethically responsible learning environments.

Future research should explore how AI can optimize long-term fluency and cultural understanding. A blended approach is recommended to maintain human elements like cultural awareness and critical thinking, which teachers uniquely foster (Liu & Wang, 2024). Professional development is crucial to help educators effectively integrate AI. Further studies could examine shifts in teacher-student dynamics, whether AI redefines or complements teacher roles, and ethical challenges like algorithmic bias or over-reliance on technology.

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