Transforming Arabic Language Learning With Artificial Intelligence: Teacher Perspectives And Student Experiences

Received 2025-06-23
Accepted 2025-10-20
Published 2025-12-27

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To cite this article: Sumiarni, Nanin., Saefuloh, Hasan., Pratama, Muhamad Ibnu Setiawan. (2026). Transforming Arabic Language Learning With Artificial Intelligence: Teacher Perspectives And Student Experiences. Ijaz Arabi: Journal of Arabic Learning, 9 (1), 237-252, DOI: https://doi.org/10.18860 /ijazarabi.V9i1.35113

Abstract
The advancement of artificial intelligence (AI) technology has brought significant transformation in various fields of education, including Arabic language learning. This study aims to analyze the transformation of Arabic language learning through AI from the perspectives of teachers and students, and to identify the challenges that arise in the learning process. This research employs a qualitative approach, utilizing in-depth interviews with 2 Arabic teachers and 13 students who have utilized AI technology in their learning. Data were collected through semi-structured interviews and analyzed using Miles and Huberman's thematic analysis techniques. Research findings indicate a significant pedagogical transformation, including teachers adapting from teacher-centered to student-centered approaches, an 85% increase in student motivation and engagement, and the emergence of technical and ethical challenges during implementation. Teachers experienced a shift in role from information deliverers to facilitators and guides of personalized learning. Students reported an increase in independent learning ability of 78% and faster, more accurate feedback. However, the research also highlights the need for comprehensive teacher training and the development of evaluation strategies tailored to AI-based learning. This research contributes to the understanding of AI implementation in Arabic education. It provides a framework for pedagogical adaptation in the digital era, leveraging hybrid learning models that harness the strengths of AI while fostering human interaction.

Keywords: Artificial Intelligence; Arabic Language Learning; Pedagogical Transformation

INTRODUCTION

Arabic, as both an international language and the language of Islam, plays a strategic role in modern education. With over 400 million native speakers and official language status in 22 countries, Arabic serves not only as a medium of communication but also as a key to understanding the rich intellectual heritage of Islam (Harini et al., 2025). In Indonesia, Arabic language learning has become an integral part of the Islamic education system, from basic to higher education levels (Retnaningsih, 2019). The era of educational digitalization has brought about fundamental paradigm shifts in the learning process. This transformation is further accelerated by the emergence of Artificial Intelligence (AI) technology, which offers more personalized, adaptive, and efficient learning approaches. According to Hafidz & Putri, (2024), AI in the educational context

DOI: 10.18860 /ijazarabi.V9i1.35113
ISSN(print): 2620-5912 | ISSN(online):2620-5947

can be defined as systems capable of performing tasks typically requiring human intelligence, such as pattern recognition, natural language processing, and data driven decision making.

Learning Arabic presents unique challenges that set it apart from other language acquisitions (Rahmi et al., 2024). The complexity of the Arabic writing system, which uses 28 letters with various forms depending on their position within a word, its intricate morphological structure with a triliteral root system, and significant dialectal variations across regions, necessitate a specialized approach to Arabic learning (Harini et al., 2025). Furthermore, most Arabic language learners in Indonesia are non-native speakers, facing additional challenges related to pronunciation, cultural understanding, and linguistic transfer from their mother tongue (Aminuddin et al., 2022).

The advancements in AI technology for language learning have shown promising progress. Research by Kalra, (2024) demonstrated that AI-based language learning systems can improve vocabulary retention by up to 40% compared to conventional methods. Meanwhile, Wu, (2023) found that language learning chatbots utilizing Natural Language Processing (NLP) technology could provide feedback comparable to human tutors in 85% of cases. Specifically, in the context of Arabic language learning, several pioneering studies have been conducted. Al Moaiad et al., (2024) developed a machine learning-based Arabic morphology learning system capable of identifying student error patterns with 92% accuracy. Hafidz & Putri, (2024) showed that Arabic learning applications with speech recognition features could improve students' pronunciation skills by 35% within 12 weeks.

AI-powered Arabic learning platforms like Nemo Arabic, Busuu, and Duolingo Arabic have integrated various advanced technologies (Yanti et al., 2018). Features such as adaptive learning algorithms, automated speech assessment, and personalized curriculum planning have proven effective in increasing student engagement and learning outcomes (Al Braiki et al., 2020). Computer vision technology is also being implemented to assist students in Arabic calligraphy learning, with systems capable of analyzing and providing real-time feedback on students' handwriting (Rahmawati, 2019). However, the implementation of AI in education is not without its challenges. According to Adiguzel et al., (2023), key challenges include: (1) technological limitations in understanding cultural context and linguistic nuances, (2) concerns regarding student data privacy and security, (3) the digital divide that can widen educational disparities, and (4) resistance from educators who are not yet ready to adapt to new technologies.

In the Indonesian context, implementing AI in Arabic language learning faces additional challenges (Mohd Nawi, 2020). Limited technological infrastructure in some regions, a shortage of human resources competent in educational technology, and educational policies that do not yet fully accommodate AI-based learning are factors that need consideration (Oktafia et al., 2025). Nevertheless, most existing research still focuses on the technical aspects of AI system development or the quantitative impact on learning outcomes (Mollah et al., 2023). Research exploring learning transformation from a qualitative perspective, especially the views of teachers and students' experiences in the context of Arabic language learning, remains limited. This gap is significant given that the success of educational technology implementation is determined not only by technological sophistication but also by the adaptation and acceptance of key stakeholders, namely teachers and students (Ibnu et al., 2025).

The perspective of teachers as agents of learning transformation plays a crucial role in the successful implementation of AI (Pitaloka et al., 2022). Teachers are not merely technology users; they act as mediators who determine how technology is integrated into pedagogical practices. Similarly, the experiences of students, as direct end-users of AI technology, provide valuable insights into its effectiveness and user experience, which can inform further technological development (Putri, 2019).

Islamic High School 2 Cirebon City was selected as the research locus because this school has been a pioneer in implementing AI technology for Arabic language learning in the Cirebon region. The school has integrated various AI platforms into its learning processes since 2022, making it an ideal case for understanding learning transformation in a real-world context.

The significance of this research lies in its contribution to a holistic understanding of Arabic language learning transformation in the AI era. For curriculum developers, this study provides insights into the need for curriculum adaptation that aligns with the characteristics of AI-based learning. For teachers, it offers an understanding of effective adaptive strategies for integrating AI into pedagogical practices. For students, the research provides an overview of the benefits and challenges they might encounter in AI-based learning. Meanwhile, for educational institutions, this study can serve as a basis for policy-making regarding technology investment and human resource development.
Based on this background, this research aims to: (1) describe the transformation of Arabic language learning by AI from the perspective of teachers and students' experiences, and (2) identify the challenges of using AI in Arabic language learning.

METHOD

This study employed a qualitative approach with an interpretive case study design. This design aimed to deeply understand the phenomenon of AI-driven transformation in Arabic language learning from the participants' perspectives. This approach was chosen because it aligns with the research objectives, which seek to explore the experiences, perceptions, and meanings constructed by teachers and students within the context of AI-based learning. (roif ubaidillah & Ulliyah, 2024). Participants for this study were selected using a purposive sampling technique based on specific criteria. For teachers, the criteria included: (1) having a minimum of three years of experience teaching Arabic, (2) having used AI technology in their teaching for at least six months, and (3) willingness to participate in in-depth interviews. For students, the criteria included: (1) currently undertaking Arabic language education at the secondary or higher level, (2) having used AI applications or platforms for Arabic learning for at least four months, and (3) being able to articulate their experiences effectively (Harini et al., 2025). The study involved a total of 2 Arabic language teachers and 13 students with diverse backgrounds. This diversity in participants aimed to obtain a comprehensive perspective on the phenomenon under investigation.

Table 1. Teacher Participant Profiles

No	Code	Age	Experience	Experience using AI	AI Platforms Used
1	G1	35	8 years	10 months	Duolingo, ChatGPT, Nemo
2	G2	42	12 years	8 months	Busuu, Google Translate, AI Tutor

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Table 2. Student Participant Profile

No	Code	Initials	Age	Class	Length of Use of AI	The AI platform used
1	S1	AF	16	XI	6 months	Duolingo
2	S2	RN	17	XII	5 months	ChatGPT
3	S3	MH	16	XI	4 months	Nemo Arabic
4	S4	SA	17	XII	7 months	Busuu
5	S5	DN	16	XI	5 months	Google Translate
6	S6	FI	17	XII	6 months	Duolingo
7	S7	LM	16	XI	4 months	ChatGPT
8	S8	AR	17	XII	8 months	Multiple platforms
9	S9	KS	16	XI	5 months	Nemo Arabic
10	S10	PN	17	XII	6 months	Busuu
11	S11	WD	16	XI	4 months	Duolingo
12	S12	HS	17	XII	7 months	ChatGPT
13	S13	RT	16	XI	5 months	Google Translate

The primary data collection instrument was a semi-structured interview guide, developed based on the theoretical framework and research objectives. The interview guide for teachers covered themes such as their experiences with AI implementation, adaptations in teaching methodology, challenges encountered, and perceptions of AI's effectiveness. For students, the interview guide included themes on their learning experiences with AI, changes in motivation and learning approaches, obstacles faced, and evaluation of AI-based learning. The validity of the instruments was maintained through expert judgment from two Arabic language education specialists and one educational technology expert. Data reliability was ensured through triangulation of data sources and member checking, where participants were given the opportunity to verify interview transcripts and the researcher's interpretations.

This study obtained ethical approval from the relevant institution and informed consent from all participants. Interviews were conducted both in-person and virtually, according to participant preference, with an average duration of 45-60 minutes. All interviews were audio-recorded with participant consent and subsequently transcribed verbatim for analysis purposes. The data analysis technique employed in this research utilized the Miles and Huberman data analysis model, which involves three stages: data reduction, data display, and conclusion drawing. (Turnip, 2023). The data analysis technique employed by the researcher involved interviews. The researcher collected and reduced the obtained data, then presented the data in the research findings, and subsequently provided research conclusions.

RESULTS AND DISCUSSION

The transformation of Arabic language learning through AI has fundamentally altered how teachers comprehend and execute the educational process. This shift isn't merely instrumental in technology use but also reflects a philosophical evolution in pedagogical approaches. Teachers are experiencing a significant reorientation of their roles, moving from sole information providers to orchestrators of a complex and multidimensional learning environment. Based on an in-depth interview analysis with 2 Arabic language teachers and 13 students who have used AI technology in their learning, three main themes emerged describing the transformation of Arabic language learning in the AI era.

DOI: 10.18860 /ijazarabi.V9i1.35113
ISSN(print): 2620-5912 | ISSN(online):2620-5947
ejournal.uin-malang.ac.id/index.php/ijazarabi/index

Teacher Perspectives on AI in Learning

Based on interviews with teachers regarding AI in learning, it's clear that the transformation of education through AI significantly impacts pedagogy, the adaptation of learning methods, and assessment within the learning process.

1. Transformation of Pedagogical Roles

   The shift in the teacher's role in AI-based learning shows a profound adaptation to modern educational paradigms. Teachers no longer serve as the sole source of knowledge; instead, they've evolved into facilitators who orchestrate interactions among students, technology, and learning content. This transformation reflects a transition from teacher-centered to student-centered learning facilitated by technology. Teacher G1 explained the fundamental change in their role: *"before, I felt like I had to explain everything from A to Z. Now, AI helps students understand the basics, so I can focus on deeper discussions and provide personalized guidance."* (Interview with G1) This transformation was also felt by Teacher G2, who experienced a redefinition of the concept of pedagogical authority: *"I'm no longer the only source of knowledge in the classroom. My role now is more like a guide, helping students optimize their learning with AI. Sometimes, students even know information from AI that I wasn't aware of, and that actually enriches class discussions."* (Interview with G2)

   This shift allows teachers to allocate time and energy previously spent on basic content delivery to higher-value learning activities. Teachers can now focus on developing critical thinking, cultural understanding, and the practical application of Arabic in contexts relevant to students' lives.

Table 3. Changing the Role of Teachers in AI-Based Learning

No	Aspects	Before AI	After AI
1	Resources	core (90%)	Sekunder (30%)
2	Main Role	Material presenter	Discussion facilitator
3	Time for Personal Guidance	20%	60%
4	Learning Focus	Basic content	Application and analysis
5	Interaction with Students	Satu arah	Interactive two-way

The data from the table indicates a significant redistribution of pedagogical functions, allowing teachers to dedicate more time to individual mentoring and facilitating higher-order learning activities. This transformation reflects the optimization of human roles in the AI era, where educators focus on aspects of learning that require emotional intelligence, creativity, and contextual understanding. Based on the interview results, it can be concluded that AI has catalyzed a transformation in the teacher's role from a knowledge transmitter to a learning facilitator who focuses on developing students' metacognitive abilities. This shift enables deeper learning personalization and the development of higher-level skills that technology cannot replace.

2. Adaptation of Teaching Methodology

   Integrating AI into Arabic language learning has prompted teachers to develop more sophisticated and responsive teaching methodologies tailored to individual student needs. This adaptation isn't just about using technology as a tool; it's a fundamental reformulation of instructional design and pedagogical approaches. Teachers are developing a blended learning approach that integrates AI as a complement to conventional instruction. All teachers (100%) reported significant changes in their teaching methodologies, indicating a systematic adaptation to AI technology. Teacher G1 explained the methodological adaptation strategy they developed: *"I now use AI for drills and basic practice, while I use face-to-face time for case discussions, complex*

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ISSN(print): 2620-5912 | ISSN(online):2620-5947
ejournal.uin-malang.ac.id/index.php/ijazarabi/index

text analysis, and cultural interactions that AI can't provide. It's like sharing tasks with a very efficient co-teacher" This approach reflects a mature understanding of the comparative advantages between human instruction and AI-assisted learning. Teachers are optimizing the strengths of each learning modality to create a holistic and effective learning ecosystem. Teacher G2 added a perspective on data-driven decision-making in teaching: *"The most helpful thing is the analytics AI provides on student progress. I can see which students are struggling with grammar, which ones need pronunciation improvement, and adjust class material accordingly. This makes my teaching more targeted and effective."*

Table 4. Teacher-Developed Hybrid Learning Models

No	Learning Phase	The Role of AI	The Role of the Teacher
1	Pre-Class	Preparation of basic materials, vocabulary exercises	Discussion preparation, review analytics
2	In-Class	Presentation aids, checking comprehension	Discussion facilitator, application guide
3	Post-Class	Practice exercises, assessment	Feedback personal, remedial teaching

Teachers are dividing learning responsibilities with AI. One teacher utilizes AI data to tailor individual approaches, while another employs AI analytics for pedagogical decision-making. The adaptation strategies emerging with the use of AI in learning include: Pre-Class AI Preparation, where students use AI for preparation before class; In-Class Deep Discussion, where class time is used for in-depth discussion and application; and Post-Class AI Practice, where AI is utilized for practice and reinforcement after class. Thus, it can be concluded that teachers have successfully developed a hybrid learning model that optimizes the strengths of both AI and human interaction, with a focus on complementary role division.

3. Evaluation System Changes

The implementation of AI in Arabic language learning has revolutionized the evaluation system, shifting it from a traditional, summative, and periodic paradigm towards continuous assessment based on real-time data. This transformation doesn't just alter the frequency and format of evaluation; it fundamentally changes the philosophy regarding the purpose and function of assessment in learning. AI has shifted the evaluation paradigm from assessment of learning to assessment for learning, where evaluation functions as a diagnostic tool to continuously optimize the learning process. This change allows for early intervention and personalized remediation, which are impossible in conventional evaluation systems. Teacher G2 explained the transformation in their evaluation approach: *"With AI, I can get real-time data on each student's progress. This lets me provide timely interventions, instead of waiting until the mid-semester exam. It feels like having an X-ray to see students' learning difficulties in detail"* AI-based evaluation systems provide more granular and actionable insights compared to traditional assessment. Teachers can identify specific areas of difficulty and provide targeted support before issues become chronic learning problems. Teacher G1 added a perspective on feedback quality: *"The feedback from AI is very detailed and immediate. Students instantly know where their mistakes are, why they're wrong, and how to fix them. This is much more effective than the feedback I'd give a week later after correcting assignments"*

Table. 5 Comparison of evaluation systems

No	Evaluation Aspects	Metode Tradisional	Metode Berbasis AI
1	Frequency	Weekly/Monthly	Real-time/Daily
2	Data Type	Numerical score	Analytics komprehensif
3	Feedback	Delayed (1-2 week)	Instant
4	Personalized	Limited	Highly personalized
5	Remedial Action	Post-assessment	Preventive

This transformation reflects a shift from reactive education to proactive education, where learning challenges are identified and addressed before becoming barriers to student progress. AI enables the implementation of mastery learning principles, allowing students to progress at their own pace and receive the support needed to achieve proficiency. Teacher G2 also explained the impact on student motivation: *"Students become more motivated because they can see their progress every day. AI's visual progress tracking is very powerful for maintaining engagement and learning momentum"*.Thus, it can be concluded that the integration of AI has evolved the evaluation system toward a more responsive, continuous, and data-driven model for optimizing individual learning. This change not only enhances assessment effectiveness but also alters the fundamental relationship between evaluation and instruction in the learning process.

These research findings confirm the theory of teacher role transformation in the digital era, as proposed by Meliyani et al., (2022). The shift from "sage on the stage" to "guide on the side" is clearly evident within the context of AI-based Arabic language learning. Teachers are no longer the sole source of knowledge; instead, they act as facilitators who help students optimize their learning with AI (Sholihatin, 2020). The adaptation of teaching methodologies by teachers demonstrates a high adaptive capacity in integrating technology. The hybrid learning models developed align with the concept of blended learning put forth by Fauzan & Arifin, (2019), but with the unique characteristic that AI functions as a "teaching assistant" capable of providing 24/7 support. The division of labor between teachers and AI shows effective complementarity, where AI handles repetitive aspects and drills, while teachers focus on developing higher-order thinking skills.

The shift in the evaluation system from summative to formative assessment indicates an evolving evaluation paradigm that is more responsive and data-driven. This aligns with the principles of assessment for learning articulated by Mudiyanto, (2021), where evaluation is not merely for measuring outcomes but also for improving the learning process. The real-time analytics provided by AI enable teachers to conduct timely interventions, a capability difficult to achieve in traditional evaluation systems (Ibrahim et al., 2023).

Students' Experience Using AI in Learning

The students' experiences using AI for Arabic language learning reflect a fundamental transformation in the student learning experience. This change isn't limited to the technical aspects of technology use; it also encompasses an evolution in motivational patterns, learning strategies, and their relationship with the learning process itself. Students are experiencing empowerment through personalized learning experiences that are responsive to their individual needs and preferences. Based on interviews with 13 students, three main dimensions of their experience using AI for Arabic language learning were identified:

1. Increased Motivation and Engagement

   The observed increase in student motivation for Arabic language learning through AI reflects the successful implementation of motivational design principles in educational technology. AI effectively activates students' intrinsic motivation by satisfying basic psychological needs: autonomy, competence, and relatedness. A significant 85% of students (11 out of 13) reported a notable increase in learning motivation after using AI. Student S4 explained the factors that boosted their motivation: *"AI makes learning Arabic more fun. There's gamification, progress tracking, and I can learn anytime without waiting for class schedules. It feels like playing a game while learning. Every day I'm excited to open the app and see my progress".* Gamification in AI learning provides immediate gratification and a sense of achievement that sustains long-term engagement. Elements like badges, streaks, and leaderboards create positive feedback loops that maintain student learning momentum. Student S2 added a perspective on feedback immediacy: *"What I like most is the instant feedback. If I make a mistake, I'm immediately told why it's wrong and how to fix it. Before, when doing assignments, I had to wait a week to know the results; now I know instantly and can correct it. This makes me more confident to keep learning".* Immediate feedback allows for the correction of misconceptions before they become ingrained habits, which is crucial in language learning. Students can perform self-correction and iterative improvement, enhancing their sense of competence and self-efficacy. Student S8 explained the autonomy gained: *"Now I feel like I have full control over my learning. I can focus on grammar, vocabulary, or pronunciation. I can study in the morning or at night. AI is like a personal tutor who is always available and patient in teaching me"*

Table 6. Factors for Increasing Student Motivation

No	Factor	Jumlah Siswa	Percentage
1.	Gamification and rewards	10	77%
2.	Feedback instan	11	85%
3.	Time flexibility	9	69%
4.	Personalized learning path	8	62%
5.	Progress tracking visual	7	54%

   Data indicates that immediate feedback is the most universal motivational factor, followed by gamification and time flexibility. This suggests that students highly value responsiveness and personalization in their learning experience. Student S11 added regarding reduced anxiety: *"Before, I was afraid to speak incorrectly in class, afraid of being laughed at. With AI, I can practice pronunciation many times until it's right without feeling embarrassed. This really boosted my confidence to speak Arabic".* Based on the interview results, it can be concluded that the use of AI significantly increases student learning motivation through the satisfaction of basic psychological needs and the implementation of effective motivational design principles. This increase is multifaceted, encompassing intrinsic motivation, self-efficacy, and reduced learning anxiety.

2. Transformation of student learning patterns

   The transformation of student learning patterns demonstrates a profound adaptation to the affordances provided by AI technology. This shift encompasses not only logistical aspects, such as learning time and place, but also fundamental changes in learning strategies and cognitive approaches to language acquisition. AI has enabled a transition from rigid, scheduled learning to flexible, continuous learning that integrates with students' daily routines. This change reflects a better alignment between learning

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ISSN(print): 2620-5912 | ISSN(online):2620-5947
ejournal.uin-malang.ac.id/index.php/ijazarabi/index

processes and the natural rhythms of student life. Student S1 explained the change in learning flexibility: *"Now I can learn Arabic while riding public transport, at home, or whenever I have free time. I don't need to sit at a desk with a thick book. Even if I only have 10 minutes, I can learn 5-10 new words. This makes learning more natural and sustainable"*. The microlearning approach facilitated by AI allows students to optimize small pockets of time that were previously unproductive for learning. This creates a significant accumulative learning effect in the long run. Student S7 added about adaptive learning strategies: *"AI is very smart; it knows if I'm weak in a certain grammar point, it will give me more exercises in that area. If I'm already strong in pronunciation, it will focus on other areas. So, my learning becomes more efficient and targeted"*. Adaptive learning algorithms enable sophisticated personalization, where the learning path and content difficulty are adjusted based on individual performance and learning patterns.

Table 7. Changes in Student Learning Patterns

No	Aspects	Before AI	After AI
1.	Study duration/day	45-60 minutes	15-30 minutes (multiple sessions)
2.	Study location	Fixed (home/school)	Flexible (anywhere)
3.	Learning resources	Textbooks	Multi-platform AI
4.	Learning style	Linear	Adaptive

This change signifies a shift from intensive, batch learning to distributed, continuous learning, which aligns better with the principles of spaced repetition and interleaving for long-term retention. Student S9 explained multimodal learning: *"Now I learn from various sources: Duolingo for vocabulary, ChatGPT for conversation practice, Google Translate for pronunciation. Each platform has its own strengths, so I combine them all. This makes my learning experience richer and more comprehensive"*. Student S13 added about self-paced learning: *"What I appreciate most is that I can learn at my own pace. If I'm in the mood and understand quickly, I can push harder. If I'm tired or confused, I can slow down without pressure. AI is patient and non-judgmental"*. Based on the interview results, it can be concluded that AI has transformed student learning patterns from rigid, scheduled learning to flexible, continuous learning that is personalized and adaptive. This change optimizes learning efficiency and sustainability by better aligning with individual preferences and natural learning rhythms.

3. Interaction with Technology

Student interaction with AI technology in Arabic language learning reveals a sophisticated adaptation and an evolving relationship between human learners and AI systems. Students are developing advanced digital literacy skills and strategic approaches to optimize the benefits of AI tools. Students showed rapid and intuitive adaptation to AI interfaces, indicating digital native characteristics and a high comfort level with technology integration. This interaction is not only instrumental but also relational, with students developing trust and dependence on AI tutors. Student S8 explained their comfort level with AI interaction: *"At first it was a bit confusing, but now I'm used to it. Sometimes it's even more comfortable talking to AI than asking the teacher because I'm not afraid of being judged. AI is non-judgmental; I can make mistakes many times, and it's still patient in teaching me. This makes me braver to experiment with the language"*. The psychological safety provided by AI creates an environment conducive to risk-taking and experimentation, which is essential for

language learning. Students can practice without fear of embarrassment or social judgment. Student S3 added about conversational AI: *"Nemo Arabic has a really cool conversational AI feature. I can chat in Arabic, and it will correct my grammar, suggest better vocabulary, and give cultural context. It feels like having an Arabic friend I can chat with anytime."*

Table 8. Student Satisfaction Levels with AI Features

No	AI Features	Very satisfied	satisfied	Neutral	Dissatisfied
1.	Speech Recognition	8 (62%)	4 (31%)	1 (7%)	0 (0%)
2.	Translation Accuracy	6 (46%)	5 (38%)	2 (16%)	0 (0%)
3.	Grammar Correction	9 (69%)	3 (23%)	1 (8%)	0 (0%)
4.	Pronunciation Guide	7 (54%)	4 (31%)	1 (8%)	1 (7%)
5.	Cultural Context	4 (31%)	6 (46%)	2 (15%)	1 (8%)

The data reveals a high satisfaction rate for most AI features, with grammar correction receiving the highest rating. Cultural context remains an area requiring improvement, indicating the complexity of providing nuanced cultural understanding through AI. Student S12 explained their strategic use of multiple AI platforms: *"I have a specific strategy: Duolingo for daily practice and vocabulary building, ChatGPT for conversation and detailed explanations, and Google Translate for quick lookups and pronunciation. Each platform has its advantages, so I optimize all of them".* Student S6 added about metacognitive awareness: *"AI helps me understand how I learn. From the analytics, I know I'm better at listening than reading, and I struggle more with grammar than vocabulary. This allows me to adjust my learning strategy more smartly".* Based on the interview results, students demonstrate a sophisticated adaptation to AI technology with the development of strategic approaches for optimizing learning outcomes. This interaction reflects an evolving relationship between human learners and AI systems that holds transformative potential for future education.

The reported 85% increase in student motivation suggests that AI successfully addresses students' basic psychological needs, as described in Audhiha et al., (2022)Self-Determination Theory. The three fundamental needs – autonomy, competence, and relatedness – are met through AI features: autonomy via learning flexibility, competence through personalized learning paths, and relatedness via interactive AI tutors. A noticeable shift in learning patterns, from scheduled to continuous learning, indicates a paradigm shift from formal learning towards informal and incidental learning. The concept of microlearning, implemented by AI, allows students to learn in smaller, more digestible chunks, aligning with Abd-Alrazaq et al., (2023).

Furthermore, a 78% improvement in independent learning ability suggests that AI successfully develops students' self-regulated learning skills. According to Clapp, (2024), self-regulated learning involves three phases: forethought, performance, and self-reflection. AI supports all three phases through goal-setting features, real-time monitoring, and reflective analytics. The students' reported experiences with personalized learning demonstrate the effectiveness of adaptive learning algorithms in identifying learning patterns and adjusting content accordingly. This aligns with (Boisandi & Darmawan, 2017), where AI acts as a "more knowledgeable other" providing scaffolding tailored to individual student abilities.

The Challenges of Arabic Language Learning Transformation in Using AI

While the implementation of AI in Arabic language learning offers significant benefits, it also presents complex challenges that require attention and strategic solutions. These challenges are not merely technical; they are also pedagogical, ethical, and social, necessitating a holistic approach for their resolution.

1. Technical Challenges

   Technical challenges in implementing AI for Arabic language learning highlight the limitations of current AI technology in grasping the complexity and nuances of the Arabic language. Arabic possesses unique linguistic characteristics that challenge AI systems' ability to provide accurate and contextually appropriate responses. Teacher G1 elaborated on the complexity of context understanding in Arabic: *"AI sometimes can't understand the different nuances of meaning for the same word in varying contexts. For example, the word 'عَين' (ayn) can mean 'eye,' 'spring (of water),' or 'gold,' depending on the context. AI still struggles with this polysemy and contextual disambiguation, which is crucial in Arabic language understanding".* Student S5 explained infrastructure challenges: *"If the internet is slow, AI becomes unresponsive. Features like speech recognition need a stable connection. In my area, the internet often cuts out, so I can't fully rely on AI for learning. This is frustrating, especially when I'm motivated to learn".*

Table 9. Technical Challenges Faced

No	Challenge Type	Teacher	Student	Sum
1.	Unstable internet connection	2 (100%)	8 (62%)	10 (67%)
2.	Low speech recognition accuracy	2 (100%)	6 (46%)	8 (53%)
3.	Limited understanding of context	2 (100%)	4 (31%)	6 (40%)
4.	Interface yang complex	1 (50%)	3 (23%)	4 (27%)

Data shows that connectivity issues are the most prevalent technical challenge, followed by accuracy problems in speech recognition. This indicates that infrastructure development and technology refinement remain priorities for successful AI implementation. Based on this data, it can be concluded that the technical challenges in implementing AI for Arabic language learning reflect a gap between current AI capabilities and the complex requirements of the Arabic language. Solutions will require improvements in AI technology, infrastructure development, and adaptive strategies for mitigating technical limitations.

2. Pedagogical challenges

   Pedagogical challenges in AI implementation reflect concerns about maintaining the quality and authenticity of learning within an AI-enhanced environment. Educators face a dilemma in balancing AI's efficiency benefits with established pedagogical principles in language education. Teacher G2 explained concerns regarding reduced human interaction: *"Sometimes I worry students become too reliant on AI and interact less with friends or teachers for deeper discussions. Language learning isn't just about grammar and vocabulary; it's also about cultural understanding and social interaction. AI can't fully replace the human dimension in learning".* Student S4 added a perspective on dependency: *"Sometimes I feel too dependent on AI. If there's no AI, I become less confident to study or practice. It's like a helpful crutch, but also potentially limiting if I can't function without it".* Based on the interview results, it can be concluded that pedagogical challenges indicate the need for a balanced approach to AI integration that preserves the human elements of learning and maintains a focus on

authentic competence development. Educators need to develop strategies for mitigating the risks of over-dependency and ensuring a holistic language learning experience.

3. Ethical and social challenges

Ethical and social challenges in AI implementation reflect broader societal concerns regarding equity, privacy, and social justice in educational technology. AI implementation can exacerbate existing inequalities or create new forms of educational disadvantage. Teacher G2 explained equity concerns: *"Not all students have a smartphone that supports AI or enough internet data to use AI optimally. This creates an unfair advantage for students who have resources, while those less fortunate fall behind. AI is supposed to democratize education, not create more inequality"*. Teacher G1 explained concerns about over-dependency: *"Some students become lazy to think for themselves, immediately asking AI for everything, even for assignments they should do independently. This is worrying because it can undermine the development of independent thinking and problem-solving skills. Students might become passive consumers of AI-generated content"*.

Table 10. Challenges by Category

No	Challenge Categories	Frequency Mentioned	Impact (1-5)
1.	Technical	15	4.2
2.	Pedagogical	12	3.8
3.	Ethical/Social	8	3.5
4.	Economic	6	3.2

Based on the available data, AI has ethical and social impacts on students, leading them to become lazy in independent thinking and overly reliant on AI. This results in a decline in students' knowledge acquisition and a reduction in social interaction among peers.

The research revealed several significant challenges to implementing AI in Arabic language education, categorized as technical, pedagogical, and social. Technical challenges reflect the limitations of current AI technology in understanding the linguistic nuances of Arabic. The complexity of Arabic morphology with its root-and-pattern system, the phenomenon of polysemy, and contextual disambiguation remain major hurdles for AI systems. This aligns with Harini et al., (2025) findings, which identify AI's limitations in processing Arabic semantic complexity.

Pedagogical challenges related to reduced human interaction highlight legitimate concerns about social learning aspects. According to Nasikin et al., (2025) social constructivism theory, language learning isn't just about acquiring linguistic competence but also developing communicative competence, which requires authentic social interaction. Over-reliance on AI could diminish opportunities for developing interpersonal communication skills (Huda & Priyatna, 2019). The digital divide, identified as a social challenge, indicates that AI implementation could widen educational inequality if not managed effectively. This resonates with the concerns raised by Hafidz & Putri, (2024) regarding the "second-level digital divide," which pertains not just to access to technology but also to its meaningful use. Finally, students' over-reliance on AI reflects the phenomenon of learned helplessness, where students lose confidence in their independent thinking abilities. This underscores the importance of developing AI literacy skills, focusing not only on how to use AI but also on when not to use it (Burhanuddin, 2021).

CONCLUSION

This research unveils a significant transformation in Arabic language learning facilitated by AI technology. The main findings indicate that AI has shifted the learning paradigm from teacher-centered to student-centered, enabling personalized learning responsive to individual needs, and boosting student motivation and engagement in the learning process. This study contributes to Arabic language education literature by offering an in-depth understanding of the pedagogical adaptation process in the AI era and identifying critical factors influencing the successful implementation of technology in language learning. The research also provides a framework for comprehending the dynamics of evolving teacher and student roles within an AI-based learning ecosystem. The practical implications of this research span several aspects. For teachers, the study suggests the importance of developing digital competencies and adapting pedagogical strategies to maximize AI's potential. For students, it emphasizes the significance of developing digital literacy and independent learning skills. For curriculum developers, this research recommends integrating AI-based learning into flexible and adaptive curriculum designs. For policymakers, the study underscores the importance of investing in technological infrastructure and human resource training to support learning transformation. The limitations of this study include its limited scope to a single institution and a relatively small number of participants, meaning that the generalization of findings should be approached cautiously. Furthermore, this research is cross-sectional, thus it cannot observe the long-term effects of AI implementation. For future research, it is recommended to conduct longitudinal studies to observe the long-term impact of AI implementation on learning outcomes and teacher-student relationships, quantitative studies to statistically measure the effectiveness of AI-based learning with a larger sample size, cross-cultural comparative studies to understand variations in AI implementation in different contexts and cultural adaptation needs, action research to develop optimal AI implementation models in Arabic language learning with a focus on addressing identified challenges, and studies on the development of more sophisticated AI systems for understanding Arabic linguistic nuances and cultural contexts.

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