



The Role of Artificial Intelligence in Developing EFL Learners' Autonomy: Opportunity or Obstacle?

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Abstract

The integration of Artificial Intelligence (AI) in language education has redefined pedagogical practices, particularly in English as a Foreign Language (EFL) learning. While AI-powered tools promise to enhance personalization, engagement, and learner-centered approaches, their impact on learners' autonomy remains a subject of debate. This study aims to explore the dual role of AI in fostering, or potentially hindering, the development of autonomy among Moroccan university EFL learners. Drawing on both qualitative and quantitative data, the study investigates how AI tools influence learners' decision-making, self-regulation, and motivation in language learning contexts. Combining quantitative data from questionnaires distributed to 200 EFL students with qualitative insights from interviews conducted with 10 professors, the research assesses how AI affects students' capacity for self-directed learning. The findings reveal prevalent use of AI-powered platforms such as ChatGPT, Google Translate, Grammarly, and Duolingo among EFL learners, primarily for language practice, grammar correction, vocabulary acquisition, translation tasks, and exam preparation. Both students and professors acknowledged that these tools can significantly enhance language learning autonomy by enabling personalized, flexible learning experiences and fostering increased responsibility and motivation. However, concerns were also raised about the potential downsides, particularly overreliance on AI, reduced engagement in critical thinking, and threats to academic integrity. While some professors observed improved student engagement and self-directed learning, others noted a decline in cognitive effort when learners relied too heavily on AI-generated content. Overall, AI emerged as a double-edged sword; it offers valuable support for autonomous learning, yet its unchecked use may hinder essential skill development. The study concludes that the thoughtful and guided integration of AI is crucial to ensure it strengthens rather than weakens EFL learner autonomy.

Keywords: Artificial Intelligence, autonomy, challenges, EFL learning, practices

1. Introduction

For decades, ongoing technological advancements have been changing our lifestyles, workplaces, and educational systems. Individuals are increasingly depending on digital tools for learning and work-related activities, as well as platforms and services for entertainment and communication. Indeed, digital technologies have fundamentally reshaped the ways we create, share, and consume content. Among these advancements, the most recent and perhaps the most impactful is artificial intelligence (AI). AI systems are significantly affecting our lives and social relationships through breakthrough technologies; every individual in society will connect to intelligent AI applications and services through mobile devices and other internet of things (IoT) devices.

In contemporary education, AI has become one of the most transformative technological innovations. Applications and AI-powered tools such as intelligent tutoring systems, chatbots, automated writing assistants, and personalized learning platforms have profoundly reshaped teaching and learning practices and experiences across disciplines. In the field of language education, English as a foreign language in particular, AI technologies are progressively integrated into language learning environments to support learners' linguistic development by offering interactive, adaptive, and personalized learning opportunities.

Unlike traditional teacher-centered approaches, AI-assisted learning environments encourage students to engage more actively in their learning process by allowing them to learn independently, track their progress, and have easy access to different educational contents that extend beyond the boundaries of the classroom. Hence, AI is often associated with the promotion of learner autonomy, which is considered a key element for successful language learning.

In addition to developing learners' ability to take responsibility for their learning through self-regulation and independent engagement with learning tasks, learner autonomy in EFL contexts specifically, enables learners to cultivate essential skills such as critical thinking, problem-solving, decision-making, and motivation. However, despite the increasing adoption of AI tools and applications in education, debates surrounding their actual impact on learner autonomy continue to persist. Whereas some researchers and educators emphasize the positive role of AI in enhancing learners' motivation, self-regulation, and independent learning, others remain concerned about its potential to foster overreliance on technology, weaken cognitive skills, and undermine academic integrity and ethics.

Therefore, this study attempts to investigate the impact of AI on EFL learners' autonomy by exploring how AI tools influence students' learning behaviors, motivation, self-regulation, and independent learning practices. The study also aims to identify both the opportunities and challenges associated with AI integration in language learning environments from both students' and teachers' perspectives. By examining these dimensions, this research contributes to the growing body of literature on AI-assisted language learning and provides pedagogical insights into the effective and responsible integration of AI in EFL education.

2. Literature Review

2.1 Understanding the Integration of AI technology in English Language Education

2.1.1 Definitions of Artificial Intelligence (AI)

Artificial Intelligence (AI) is the field of computer science that focuses on creating systems capable of performing tasks that typically require human intelligence, such as learning,

reasoning, problem-solving, perception, and language understanding (Russell & Norvig, 2021). It is the science and engineering of making intelligent machines, especially intelligent computer programs to understand human intelligence (McCarthy, 2007). Moreover, The European Commission, in a report released in 2018, claimed that AI is any system that exhibit intelligent behavior by assessing their environment, with a certain amount of autonomy, to accomplish particular objectives.

The term artificial intelligence was first coined by John McCarthy in 1956 when he organized the first academic conference on the subject. However, the investigation into whether or not computers are capable of true thought started far earlier. Eventually, the definition of AI evolves over time as our understanding of human cognition and intelligence deepens. As researchers uncover new insights into how humans think, learn, and process information, these advancements influence how we conceptualize and develop artificial intelligence systems. Consequently, AI is not a static concept but a dynamic field that adapts to the ongoing exploration of human intellectual capabilities and technological progress.

Numerous daily objects and systems that we use today are helped or powered by artificial intelligence (AI), which comes in a wide variety of forms. These AI-powered systems range in "humanness" from computer games to navigation systems (Google Maps), voice-based virtual assistants (Alexa, Siri, and Google Assistant), automobiles (Driver Assist), and robots (Sophia), among others.

2.1.2 The Evolution of AI in the Field of Education

In an era where AI technology is rapidly and continuously transforming our daily lives, including how we communicate, work, manage tasks, and address evolving needs, this innovation is also making a radical and profound impact on education. The integration of AI technology into language education is increasingly recognized as a transformative force and a powerful tool for enhancing the learning process in the digital age (Ahmadi, 2017). Historically, the roots of AI in education can be traced back to the late 1960s with the creation of early Intelligent Tutoring Systems (ITS) such as SCHOLAR, which attempted to adapt instruction based on learners' responses (Carbonell, 1970). These pioneering systems laid the foundations for the gradual incorporation of AI into computer-assisted instruction during the 1980s and 1990s. As Russell and Norvig (2021) explain, "the earliest intelligent tutoring systems laid the groundwork for AI-driven personalization in education by attempting to mimic the role of a human tutor" (p. 1042). The early 2000s marked a turning point, as the rise of big data and increased computing power enabled AI to manage large-scale interactions, giving rise to adaptive platforms and assessment tools (Luckin et al., 2022).

Today, AI has transitioned from experimental prototypes to mainstream applications in classrooms and online learning, becoming a cornerstone of digital pedagogy. In other terms, in the AI era, education has moved from research-driven projects into everyday teaching practices, enabling personalization, assessment, and feedback at scale (Holmes et al., 2021). In this context, as English continues to reinforce its position as the world's lingua franca, educators, learners, and institutions are seeking innovative, flexible, and effective tools to facilitate education, notably in the field of English as a Foreign Language (EFL) teaching and learning (Khouya & Alaoui, 2025, p. 355).

2.1.3 AI's Key Applications in EFL

EFL is undergoing a significant shift as AI now enables personalized learning, immediate feedback, and increased student engagement through tools, such as chatbots and adaptive

learning platforms. According to Zou and Xie (2021), AI-driven learning platforms go beyond simply providing rapid feedback to learners; they also create real-world and interactive learning experiences, enabling learners to engage in meaningful language practice and receive immediate guidance tailored to their individual needs. Applications such as *Duolingo*, *Grammarly*, *ChatGPT*, and paraphrasing platforms have become accessible and familiar tools, offering interactive, adaptive, and personalized learning opportunities. This shift not only enhances language acquisition process but also encourages learners to take greater responsibility for their own learning, thereby fostering autonomy and continuous engagement beyond the classroom. Earlier, Godwin-Jones (2019) noted that “technology integration has moved from a supplementary role to an integral component of modern pedagogy” (p. 2). Reflecting this transformation, AI-driven language learning applications such as *Duolingo* often outperform traditional educational methods in maintaining continuous learner engagement (Smith et al., 2024).

Similarly, Teng (2024) reports that learners perceived *ChatGPT* as a companion, not an enemy, in their writing process, underscoring its supportive role in brainstorming and revising texts. *Grammarly* and other automated writing evaluation tools also provide individualized corrective feedback that do not only facilitate error correction but also enhance learners' metacognitive awareness and self-monitoring skills. Beyond writing, AI-powered speech recognition systems such as those integrated in Google Assistant and *iTalki* tutors now allow learners to practice oral skills with immediate feedback, thereby improving pronunciation and fluency (Zhao, 2022). These examples showcase how AI has moved beyond novelty and evolved into the very core of contemporary language learning infrastructures. Importantly, AI doesn't only benefit learners but also assists teachers by reducing workload, improving lesson personalization, and supporting professional development. Holmes et al. (2021) further add that AI systems can support teachers by providing insights into learners' strengths and weaknesses, enabling more focused and effective instructional interventions. Ultimately, these advancements are reshaping traditional approaches to language teaching and learning, establishing AI as both a learner's ally and a teacher's assistant.

2.2 Learners' Autonomy in EFL Contexts

2.2.1 Learner Autonomy: Definitions and Historical Foundations

The concept of learner autonomy remains central to language acquisition research. The incorporation of AI cannot be fully recognized and appreciated without situating it in the broader discussion of learner autonomy, a concept that has long been regarded as central to language and EFL education. Learner autonomy reflects the shift from teacher-centered approaches to student-centered learning. Numerous scholars have highlighted its relevance to motivation, academic success, and long-term language development. The following section gathers key quotations from foundational and recent studies on learner autonomy in EFL, providing insights into how this construct has been described, advocated, and observed in practice.

Back in 1981, Holec (1981) defined autonomous learning as “the learner's ability to take charge of their own education by setting goals, selecting strategies, monitoring progress, evaluating outcomes, and taking responsibility for self-directed learning” (p. 3). Building on this foundational perspective, Little (1991) argues that autonomy involves the ability to act independently, think critically, and make decisions, highlighting its cognitive and metacognitive dimensions. Over time, autonomy has been further elaborated by scholars such as Benson (2001), who describes it as the capacity to take control of one's learning, stressing that it is shaped by both individual agency and sociocultural context. Benson (2011) reinforces

this definition, noting that autonomy goes beyond techniques, encompassing self-regulation, decision-making, and critical reflection. This historical progression shows how learner autonomy has evolved from a narrowly defined pedagogical concept into a multifaceted construct, one that embodies cognitive, affective, and sociocultural dimensions, and remains essential to understanding contemporary EFL practices.

2.2.2 Autonomy in EFL

In EFL contexts, where exposure to authentic language use outside the classroom is often scarce and deficient, the importance of autonomy becomes even more pressing and of high-priority. Benson (2013) states that autonomy is not only a tool for language learning, but also an end in itself. Besides, Cárdenas-Claros and Gruba (2014) argue that “learner autonomy in Computer-Assisted Language Learning (CALL) environments foster resilience, enabling learners to adapt to the complexity of language learning by developing strategies beyond teacher-directed instruction” (p. 90). Little (2007) similarly emphasizes that autonomy cannot be imposed but must be fostered through the learners’ active and reflective engagement in the learning process. In this regard, Oxford (2020) highlights that learner autonomy equips students with self-regulation, motivation, and critical awareness that extend far beyond classroom boundaries, making it a central competence in EFL learning where authentic linguistic input is limited. Reinders and White (2016) add that digital tools have expanded opportunities for autonomy by offering learners spaces to practice, reflect, and self-assess.

A matter of fact, AI-based tools, by providing access to real-time interaction and feedback, seem particularly well placed to support and assist such self-directed learning behaviors. As claimed by Godwin-Jones (2019), the widespread use of mobile and AI technologies has redefined learners’ roles, moving them from passive recipients of content to active constructors of knowledge. When viewed as a whole, these perspectives suggest that autonomy in EFL is not only a pedagogical strategy but also a necessity, one that is increasingly fostered and reshaped through digital and AI-mediated environments.

2.3 The Incorporation of AI in EFL and Learners’ Autonomy: Supportive vs. Hindering Roles

2.3.1 Supportive Roles of AI

In practice, AI technologies present both opportunities and challenges for learner autonomy. On the supportive side, both personalization and flexible pacing appear central. Li (2023) emphasizes that AI-driven learning environments enable learners to progress at their own pace and make choices that directly shape their learning journey (Smith et al., 2024, p. 12). This scaffolding resonates with Bai’s and Wang’s (2023) view which found that learners appreciate the self-directed opportunities offered by AI platforms, which promote confidence and ownership of learning. Additionally, Mohammed and Khalid (2025) reported that AI-generated feedback significantly promote EFL learners’ motivation, Foreign Language Peace of Mind (FLPoM), Trait Emotional Intelligence (Trait EI), and writing skills. This suggests that AI can support not only language development but also learners’ emotional well-being and motivation in the learning process. From another perspective, Alm (2024) emphasizes that autonomy development in AI environments involves Similarly, Alm (2024) argues that developing autonomy in AI-supported learning requires learners to critically assess AI-generated content, manage their interactions with AI tools, maintain their second-language voice, and use AI strategically while retaining control over their learning. This highlights that learner autonomy in AI environments depends not only on technology use but also on critical engagement and

independent decision-making. Likewise, Du and Daniel (2024) note that conversational chatbots can effectively reduce anxiety and enhance speaking skills, further strengthening the supportive role of AI in EFL contexts. Collectively, these findings suggest that when critically and responsibly integrated, AI technologies can function as powerful allies in fostering learner autonomy by enabling students to direct, monitor, and reflect on their own learning processes.

2.3.2 Risks and Limitations

AI, if misused, can hinder learner autonomy. As aforementioned, AI offers significant educational benefits; however, concerns remain regarding overdependence, reduced critical engagement, and threats to academic integrity. Aljabr (2024) argues that the uncritical use of AI shifts responsibility for decision-making from learners to technology, which creates passive learning. Similarly, according to Fearn (2024), many educators report that AI should function as a learning support tool rather than a means of bypassing genuine learning. These concerns closely align with digital literacy, which stands for the effective and responsible use of technology, including AI. In this regard, the U.S. Department of Education (2023) highlights the importance of explicitly teaching critical evaluation, transparency, and responsible decision-making when integrating AI into education.

Ethical consideration is another critical issue. García-López et al. (2025) note that AI technologies present ongoing challenges related to data privacy, algorithmic bias,⁵ and equitable access, all of which may affect learners' ability to exercise agency. Likewise, Selwyn (2019) warns that excessive dependence on AI may weaken the cognitive skills necessary for deep learning, while Zhao (2022) describes AI as a double-edged sword that improves efficiency but may simultaneously reduce teacher authority and learner responsibility. More recently, Alm (2024) argues that autonomy in AI-supported environments can be fragile when learners rely excessively on AI systems, potentially diminishing their sense of ownership and personal voice. Overall, these perspectives show that while AI offers valuable scaffolding, its uncritical use may erode precisely the independent judgment, critical thinking, and agency that learner autonomy seeks to cultivate.

3. Methods

This section outlines the research methodology adopted to collect and analyze data in this study. First, it begins by detailing the overall research design, including data collection tools, research participants, and research setting. Additionally, this section provides a brief overview of the procedures used for data analysis and interpretation.

As previously mentioned, the objective of the present study is to investigate the dual role of AI in fostering, or potentially hindering, the development of autonomy among Moroccan university EFL learners. Specifically, it aims to explore how students perceive and engage with AI tools in their language learning process, and how these tools influence their motivation, self-regulation, and independent learning practices. To achieve this, the present study employs a mixed-methods design, combining both quantitative and qualitative approaches to allow a comprehensive and nuanced understanding of the research matter/subject. In line with this approach, the study seeks to address the following research questions:

1. To what extent do Moroccan EFL students perceive AI tools as supportive of their autonomous learning?
2. What challenges and risks do students associate with the use of AI in EFL learning contexts?
3. How do EFL professors view the impact of AI on students' motivation, self-regulation, and learning responsibility?

3.1 Data Collection Tools

3.1.1 Questionnaire

The quantitative component of this study employed a structured online questionnaire designed to examine Moroccan EFL students' use of artificial intelligence (AI) tools and their perceptions of AI's influence on learner autonomy. The questionnaire was developed following an extensive review of the literature on AI-assisted language learning and learner autonomy to ensure that the instrument adequately reflected the study's research objectives and the theoretical constructs under investigation. The questionnaire consisted of two main sections. The first section collected participants' demographic information, including gender, age, and academic level. The second section examined students' experiences with AI-assisted language learning through several constructs: (a) access to AI learning tools, (b) confidence in using AI tools, (c) frequency of AI use, (d) purposes of AI use for English language learning, (e) types of AI tools employed, and (f) students' perceptions of the impact of AI on learner autonomy. The questionnaire was administered online between 25 April and 20 May 2025 through Google Forms. The survey link was distributed to Moroccan EFL university students via WhatsApp groups, Facebook groups, LinkedIn, and university coordinators who shared the questionnaire with their students. A total of 223 responses were received, of which 200 complete questionnaires were retained for analysis after data screening. Most questionnaire items were measured using a five-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree), while selected items employed multiple-choice or frequency-based response formats where appropriate to capture participants' AI usage patterns.

Learner autonomy, as the key variable in this study, was operationalized as a multidimensional construct encompassing students' ability to regulate and manage their own learning processes. Specifically, the questionnaire examined participants' perceptions of how AI influenced key dimensions of learner autonomy, including learning motivation, independent learning behaviors, self-directed learning, goal setting, learning engagement, critical thinking, and academic achievement in English language learning. These dimensions were selected because they are widely recognized in the learner autonomy literature as essential components of autonomous learning.

To ensure the quality of the instrument, its content was developed based on established literature in AI-assisted language learning and learner autonomy. Internal consistency reliability was assessed using Cronbach's alpha coefficients (Table 1). Items analysis involves statistical analysis of the results of a test administration to identify which items can be retained and which need to be discarded. Overall, the Cronbach alpha test findings represented in Table 1 confirm the suitability and validity of the designed instrument with a value ranging from 0.8 and 0.9, indicating the appropriateness and validity of the survey items.

Table 1. Detection Coefficient of Cronbach Alpha on Teachers' Survey Variables

Cronbach alpha	Number of entries
.853	15

3.1.2 Interview

Complementing the quantitative findings, the qualitative component of the study consisted of semi-structured interviews conducted with ten EFL professors from Moroccan higher education institutions. The interviews were designed to explore educators' perspectives on the integration of artificial intelligence (AI) into English language teaching, with particular emphasis on its influence on learner autonomy, critical thinking, motivation, self-regulation, and ethical engagement. By eliciting participants' professional experiences and observations,

the interviews provided a deeper understanding of the pedagogical implications of AI use, complementing the quantitative findings obtained from the student questionnaire.

The interviews were conducted between May 10 and May 30, 2025. Six interviews were conducted face-to-face and audio-recorded with participants' consent, while the remaining four were conducted online. The use of a semi-structured interview format ensured consistency across participants while allowing sufficient flexibility to probe emerging issues and encourage participants to elaborate on their experiences and viewpoints.

The interview protocol covered several key themes, including professors' perceptions of students' use of AI tools, the reasons motivating students to use AI for language learning, observed changes in learners' behaviors, particularly regarding motivation, self-regulation, and independent learning, the perceived benefits and challenges of AI for fostering learner autonomy, the ethical implications of AI use in EFL education, including issues related to academic integrity and plagiarism, and recommendations for the responsible and effective integration of AI into language teaching and learning. This structure encouraged participants to provide both descriptive accounts based on their classroom experiences and evaluative reflections grounded in their professional expertise.

The interview data were analyzed using thematic analysis. Following transcription of the recorded interviews, the researcher repeatedly reviewed the transcripts to become thoroughly familiar with the data. Meaningful segments of text relevant to the research objectives were identified and assigned initial codes. Similar codes were subsequently grouped into broader categories, which were then refined into overarching themes representing participants' shared perceptions of AI-assisted language learning and learner autonomy. Throughout the analysis, themes were continuously reviewed against the original interview transcripts to ensure consistency and faithful representation of participants' perspectives.

To enhance the trustworthiness of the qualitative findings, the researcher adopted an iterative analytical process involving repeated reading of the transcripts, continuous comparison between the emerging themes and the original data, and careful refinement of coding decisions throughout the analysis. Representative quotations from participants are presented in the results' section to illustrate and support the major themes identified.

Overall, using both questionnaires and interviews enables triangulation of data, enhancing the validity and richness of the findings. It ensures that both learners' experiences and educators' insights are considered in assessing the impact of AI on learner autonomy within the Moroccan EFL higher education context.

3.2. Participants and Setting

This study explored the relationship between artificial intelligence (AI) use and learner autonomy among Moroccan EFL students through a mixed-methods research design. The quantitative component involved 200 EFL students enrolled in undergraduate, master's, and doctoral programs across different Moroccan higher education institutions. The sample included participants from diverse universities, academic levels, and demographic backgrounds, providing a broad representation of Moroccan EFL learners. Participation was voluntary, and all respondents provided informed consent prior to completing the questionnaire. The diversity of the sample enabled the study to capture a wide range of perspectives on AI use and learner autonomy within the Moroccan EFL context.

As presented in Table 2, the sample consisted of 79 male students (39.5%) and 121 female students (60.5%). The majority of participants (85%) were between 18 and 24 years of age, while 9% were aged between 25 and 30 years, and 6% were above 30 years old. Regarding

academic level, 76% were undergraduate students, 14% were master's students, and 10% were doctoral researchers.

Table 2. EFL Learners' Demographic Distribution.

Variable	Frequency	Percentage
Gender		
Male	79	40%
Female	121	60%
Age		
Between 18 and 25	170	85%
Between 25 and 30	18	09%
Above 30	14	07%
Academic Level		
Bachelor's Degree (Undergraduate)	152	75%
Master's Degree	29	15%
Doctorate Degree	20	10%

The qualitative component involved semi-structured interviews with ten EFL professors from Moroccan higher education institutions. Participants were selected through purposive sampling based on their experience in English language teaching and their familiarity with the use of AI technologies in educational settings. They were colleagues of the researcher, selected based on their availability and willingness to contribute to the research. They represent a diverse academic background, teaching at six different Moroccan universities: Sidi Mohamed Ben Abdellah University in Fes, Moulay Ismail University in Meknes, Chouaib Doukkali University in El Jadida, Hassan II University in Casablanca, Sultan Moulay Slimane University in Beni Mellal, and Ibn Tofail University in Kenitra. Their institutional diversity and professional experience enriched the qualitative component of the study, offering varied perspectives on the integration of AI tools in EFL education and their impact on learner autonomy. Respondents' perspectives provided valuable insights into the opportunities, challenges, and pedagogical implications associated with the integration of AI tools in EFL learning and the development of learner autonomy.

3.3. Data Analysis Process

Data analysis was conducted using SPSS. The most popular software program of its kind is SPSS, a powerful and all-inclusive survey research platform that offers clear and accurate numerical results. Both descriptive and inferential statistical techniques were employed. To start with and to understand the sample profiles, the first stage of data analysis involved summarizing background and demographic information as simple descriptive percentages and frequencies. For the qualitative data obtained from the semi-structured interviews, they were analyzed using thematic analysis. The analysis followed several stages, beginning with repeated readings of the interview transcripts to achieve familiarity with the data. Meaningful units of information were then coded and organized into categories based on recurring patterns and shared meanings. These categories were subsequently synthesized into broader themes reflecting participants' perceptions of the role of AI in fostering or hindering learner autonomy. To enhance the credibility of the findings, the coding process involved continuous comparison between emerging themes and the original interview data to ensure consistency and accurate representation of participants' views.

4. Results

This section presents the findings of both the survey conducted with 200 EFL university students and the interview administered with 10 EFL professors to investigate the role of AI in fostering, or potentially hindering, the development of autonomy among Moroccan university EFL learners.

First, this section showcases the findings emanating from the questionnaire particularly designed and employed to examine EFL learners' attitudes and perceptions regarding their use and interaction with artificial intelligence (AI) applications and services and their impact on their motivation, self-regulation, and independent learning practices in the EFL classroom.

To start with, regarding students' access to AI learning tools, the majority of respondents (72%), as shown in figure 1, confirmed having easy access. Besides, students were asked about their self-perceived ability or confidence in using artificial intelligence tools. According to figure 2, 55% reported feeling confident using AI learning tools. Although both access and confidence are relatively high, the correlation analysis showcased in Table 3 ($r = 0.089$, $p = 0.212$) indicates that the relationship between access and confidence is very weak and not statistically significant (> 0.05). This suggests that while having easy access may support confidence to some extent, it does not necessarily guarantee that students feel confident using AI tools effectively.

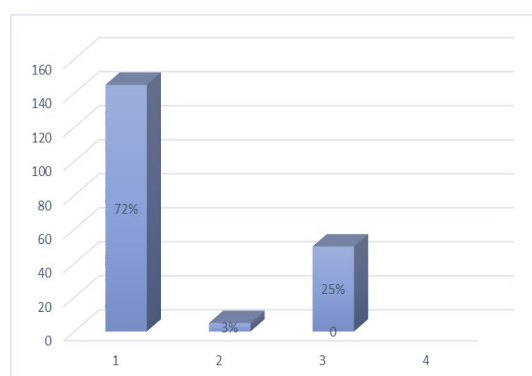


Figure 1. EFL Students Access to AI Learning Tools

Mean (M) = 1.51
Standard Deviation (SD) = 0.856

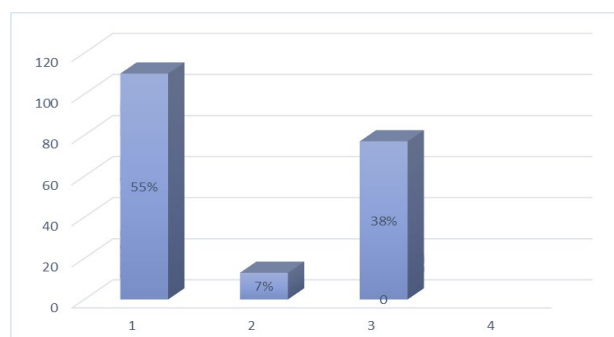


Figure 2. EFL Students' Level of Confidence in Using AI Learning Tools

Mean (M) = 1.82
Standard Deviation (SD) = 0.856

Table 3. Correlation between Students' Access to AI Tools and Their Confidence in Using Them

Variables	Pearson Correlation	Significance (2-tailed)	N
Access ↔ Confidence	0.089	0.212	200

Additionally, students were asked about the frequency of AI use for English learning. As highlighted in figure 3, 15% reported always using AI tools and services, 25% often, 42% sometimes do, 16% rarely, and 2% never do. Out of the 200 EFL learners who responded to this survey, 70% use AI tools primarily to prepare class presentations and projects. Translation, summarization, and paraphrasing was the second most frequent purpose of use (56%), reflecting students' reliance on AI for managing and understanding textual content. Moreover, 47% reported using AI tools and services mainly for exam preparation and 45% for writing and editing assistance. Finally, practicing speaking and pronunciation (28%) and grammar and vocabulary exercises (24%) are less common purposes, while listening and reading comprehension (17%) and other uses (3%) are minimal (see Table 4).

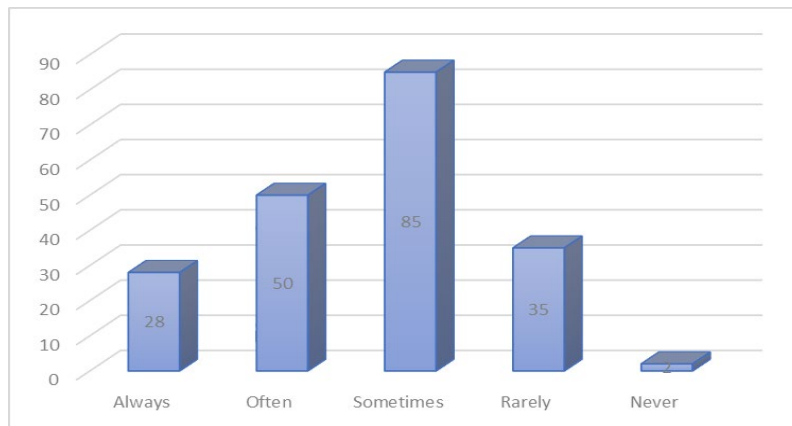


Figure 3. Frequency of AI Use for English Learning

Mean (M) = 2.65

Standard Deviation (SD) = 0.97

Table 4. AI Usage Purposes for English Language Learning

Purpose of Use	Percentage
Preparing class presentations and/or classroom projects	70%
Preparing for exams (e.g., generating questions, reviewing content)	47%
Writing and editing assistance (e.g. assignments, essays, reports, reflections)	45%
Practicing grammar and vocabulary exercises	24%
Practicing and improving speaking and pronunciation skills	28%
Translating, summarizing and paraphrasing texts	56%
Listening and reading comprehension	17%
Other	3%

As for the primary AI tools employed by EFL learners to accomplish the learning purposes described earlier, Table 5 shows that *ChatGPT* is the most widely used tool, with 83% of students reporting its use, highlighting its role as a versatile AI assistant for various language-related tasks. *Google Translate* or other AI-based translation tools are also popular (42%),

along with *Duolingo* (40%). Less commonly used tools include *Grammarly* (17%) and *Quillbot* (10%), speech recognition (6%), AI-powered dictionaries (6%), and AI-based writing platforms (3%).

Table 5. AI Tools used by EFL Students for English Language Learning

AI Tools	Percentage
Duolingo	40%
ChatGPT	83%
Grammarly	17%
Quillbot	10%
Google Translate or AI-based translation tools	42%
Speech recognition tools (e.g., Elsa speak)	6%
AI-powered dictionaries	6%
AI-based writing platforms (e.g., EssayBot, Smodin)	3%
Other	9%

After examining students' attitudes toward their use of artificial intelligence (AI) applications and services in EFL learning, it was essential, in line with the main research objective, to investigate the impact of AI usage and engagement on their learning autonomy and motivation. To this end, a series of Likert-scale questions (ranging from *strongly agree* to *strongly disagree*) were administered to capture students' perceptions of their EFL learning autonomy. The items addressed seven key aspects: the extent to which AI helps students understand and explore data; critically analyze and evaluate information; set personal learning goals and identify needs; select resources aligned with their preferences; manage time and avoid distractions; feel motivated to learn and practice English; and acknowledge external sources while maintaining independence.

Overall (as shown in Table 6), students reported moderately positive perceptions of AI in fostering learner autonomy. The highest-rated aspect was critical analysis and evaluation of information ($M = 3.89$, $SD = 1.27$), indicating that many students use AI thoughtfully rather than relying on it passively. Similarly, learners expressed agreement that AI supports them in selecting resources ($M = 3.78$) and setting personal goals ($M = 3.66$). In contrast, the lowest-rated item concerned time management and avoiding distractions ($M = 3.35$, $SD = 1.23$), suggesting that maintaining focus remains a challenge when using AI tools. Motivation to learn independently ($M = 3.57$) and efforts to avoid over-reliance on AI ($M = 3.46$) were rated moderately. Taken together, the findings suggest that while AI contributes positively to several aspects of learner autonomy, its effectiveness varies, with critical engagement and resource selection being the strongest areas, and time management the most challenging.

Table 6. The impact of AI usage and engagement on EFL students' learning autonomy and motivation

		<i>When I use AI-generated content and tools I try to understand and explore the data provided</i>	<i>When I use AI-generated content and tools, I critically analyze and evaluate the information instead of simply copying and pasting it</i>	<i>When I use AI-generated content and tools I effectively set my personal learning goals and identify my learning needs</i>	<i>When I use AI-generated content, I effectively select resources that align with my learning preferences and needs.</i>	<i>When I use AI-generated content and tools I effectively manage my time, stay focused and avoid distractions.</i>	<i>When I use AI-generated content and tools I feel more motivated to learn English and practice it on my own.</i>	<i>When I use AI-generated content and tools I avoid relying entirely on AI for completing my assignments and give credit when needed.</i>
	<i>Valid N</i>	200	200	200	200	200	200	200
	<i>Missing</i>	0	0	0	0	0	0	0
	<i>Mean</i>	3,63	3,89	3,66	3,78	3,35	3,57	3,46
	<i>Median</i>	4,00	4,00	4,00	4,00	3,00	4,00	3,00
	<i>Mode</i>	3 ^a	5	5	5	3	5	3
	<i>Sdt. Deviation</i>	1,162	1,269	1,246	1,274	1,235	1,222	1,138
	<i>Range</i>	4	4	4	4	4	4	4

4.1 Teachers' Interview Findings

To complement the quantitative findings from the questionnaire on the interplay between AI use and learning autonomy, a semi-structured interview was conducted to collect data from 10 EFL professors from different Moroccan higher education institutions. The interview data were subjected to a systematic content analysis. Given the exploratory nature of the study, a thematic analysis approach was adopted to enable the identification of recurring ideas and themes in participants' responses, offering a better understanding of how EFL professors perceive the role of AI in shaping learner autonomy.

The following section presents the key themes that emerged from the interview analysis. Each theme is discussed thoroughly, supported by illustrative examples from professors' answers.

4.1.1 AI is a Double-Edged Sword

EFL professors expressed ambivalent perceptions of AI in language learning. According to their responses, students' use of AI tools and services is considered both a beneficial learning support and at the same time a hindering factor. On the one hand, EFL professors acknowledged AI's potential to enhance learners' engagement, motivation, writing quality. On the other hand, they voiced concern about students' overreliance on these tools, which undermines some important learning skills, such as, critical thinking, creativity, and authentic language practice, and in some cases leads to other problematic issues like plagiarism and superficial learning. For instance, an EFL professor stated that 'Their use of AI is both positive and negative. If used effectively it can help them improve their language skills but it can also lead to overreliance, plagiarism and cheating'.

4.1.2 Academic Support and Language Assistance

EFL professors confirmed that AI tools and services are predominantly used by students for academic assignments and language learning support, such as in completing assignments, essays, projects, presentations, research, and even exam-related tasks. The majority of respondents explained that AI is viewed as an academic support in the EFL context as it can increase their confidence and accuracy in using the language. A professor said:

"They use AI in everything, in research and presentations. AI tools are used to bolster student writing through grammar and vocabulary assistance, enhance reading comprehension with quick definitions and summaries, practice speaking and pronunciation via feedback features, and receive personalized learning support tailored to their individual need. I think students use it for greater accuracy, fluency, and confidence in their English language journey acquisition."

4.1.3 Behavioral Transformation and Autonomy Paradox

According to respondents, the integration of AI tools in language learning has led to a noticeable shift in students' learning behaviors. The majority of EFL instructors observed that their students have become more autonomous and proactive, showing increased motivation and initiative in exploring additional resources without relying on constant teacher supervision. For instance, one professor noted

"I've noticed that my students start taking the initiative in their studies, by exploring the course and looking for additional references before coming to the classroom which ensures smoothness in the learning process."

Another interviewee stated:

"Yes, I have observed a change in my students' behavior in terms of self-regulation in the sense that they no longer rely too much on my feedback and ask for further clarifications, suggestions and guidance on tasks/assignments...(I mean I feel they don't need my supervision that much)."

This, indeed, suggested that AI can enhance greater autonomy, confidence, engagement, and motivation in the EFL context, as learners gain access to tools and services that support self-regulation and personalized learning. However, other responses reveal less positive behavioral transformation. As stated earlier, some professors expressed concern that students are becoming overly dependent on AI-generated content, leading to reduced effort and lower productivity. They emphasized that excessive dependence on AI compromises critical thinking, problem-solving, and authentic language practice. As one respondent put it,

"It is not learning autonomy. It is rather dependent learning, if we can call it learning firsthand."

Such testimonies illustrate a dual-edged behavioral shift, which explains that the impact of AI on learning behavior is not uniform but depends largely on the way students approach the use and integration of these tools into their academic practices.

4.1.4 Learner's Increased Engagement

When asked about the aspects of learning autonomy and engagement while using AI, most professors acknowledged that AI tools tend to increase students' initiative, participation, and confidence. According to their responses, thanks to AI tools and services, learners come better

prepared for class, contribute actively in classroom discussions, and submit assignments on time. One professor highlighted,

"All students get to participate and provide impressive ideas sometimes... before AI, students barely summarized readings, but now even lengthy readings are summarized."

AI appears to reduce students' barriers in completing challenging homework and tasks while it enhances their active involvement, motivation, and self-esteem, especially in tasks like classroom presentations. However, as mentioned earlier, respondents cautioned that, for some students, over-reliance on AI may undermine their true independence, with one respondent claiming,

"They don't trust their potentials, and they hence resort to AI to save their image."

4.1.5 Ethical Concerns

Interviewees consistently expressed their serious ethical concerns regarding students' use of AI tools and services in language learning. Several professors reported direct instances of misconduct, particularly in relation to plagiarism, cheating in exams, and/or submitting assignments and AI-generated essays without understanding. One professor said,

"Yes, I am currently correcting their essays, and it feels like I am correcting ChatGPT. I have 18 students and all of them are using ChatGPT. What can I do about it? Nothing."

EFL professors revealed their frustration in addressing students' misuse of AI. Therefore, they emphasized their important role in adopting some pedagogical approaches to educate about the ethical aspects of AI use in language learning, particularly, such as teaching proper citation practices, fostering critical thinking, and encouraging learners to use AI as a facilitator and support tool rather than a substitute to original work. As one respondent suggested,

"References should be cited and students ought to use AI just for headlines and guidelines to enhance learning, not to deteriorate it."

4.1.6 Recommendations for a Guided Integration

Finally, respondents were asked to provide their recommendation to effectively implement AI tools into EFL teaching to enhance students' learning autonomy. Overall, professors confirmed that effective integration of AI in EFL teaching requires careful guidance and pedagogical planning. First of all, professors emphasized the importance of raising students' awareness about both the advantages and potential drawbacks of AI tools. Students should understand that AI tools can support and facilitate learning but over-reliance may impede the development of certain essential skills like critical thinking and creativity. In addition, respondents stressed on the need to encourage students' ethical use and academic integrity. Students ought to know how to use AI thoughtfully and responsibly using critical reasoning and reflection. One respondent noted,

"I would help my students use AI tools critically to promote ethical learning... students are invited to explain how they use AI, why they use it, and what they learn from it."

Others recommended a student-centered and personalized learning approach. AI tools can support individualized practice, provide immediate feedback, and facilitate language development in context. For instance, students can use AI to improve grammar, vocabulary, or oral skills, while remaining actively engaged in learning.

Finally, EFL professors call for the introduction of AI literacy as a module and part of early curricula to enable students develop responsible usage habits and understand both the practical applications and ethical considerations of AI tools.

5. Discussion

The findings of this study provide a nuanced picture of how Artificial Intelligence (AI) tools influence EFL learners' autonomy in the Moroccan higher education context. Quantitative results from student surveys revealed that while access to and confidence in AI use were high, this did not always translate into effective or autonomous practices. Students demonstrated moderately positive perceptions of AI as a facilitator of self-directed learning, particularly in critical analysis, resource selection, and goal-setting. However, challenges persisted in areas such as time management and avoiding distractions. Similarly, qualitative insights from professors highlighted AI as both a supportive tool that fosters motivation, confidence, and self-regulation, and a potential threat when overreliance reduces cognitive effort and critical thinking.

These findings resonate with the literature that frames AI as a double-edged sword. On the one hand, prior research emphasized AI's capacity to personalize learning, offer immediate feedback, and support learner-centered practices (Zou & Xie, 2021; Teng, 2024). This was confirmed by students' appreciation for tools such as *ChatGPT*, *Duolingo*, and *Grammarly*, which enhanced their confidence and initiative. On the other hand, in line with the arguments advanced by scholars such as Selwyn (2019) and Alm (2024), respondent teachers expressed their concerns regarding the potential impact of the uncritical use of AI on diminishing learners' critical engagement, autonomy, and originality. This divergence in perspectives also aligns with earlier observations (Kessler, 2018; Howard, 2024), where teachers balance recognition of AI's efficiency with skepticism about its ethical and pedagogical risks.

Theoretically, the study highlights that autonomy is not a fixed construct but rather a continuum shaped by students' choices and attitudes toward AI tools. Autonomy development in this context requires both access to supportive technologies and the capacity for critical reflection and responsible use. In this sense, the findings reinforce Holec's (1981) and Benson's (2011) definitions of autonomy, extending them to the AI-mediated environment where learners' agency must be consciously cultivated rather than assumed.

Pedagogically, the results underscore the importance of guided AI integration. Professors consistently emphasized that students need explicit instruction on ethical and reflective use of AI tools. The findings suggest that AI literacy should become an essential component of EFL curricula, ensuring learners are equipped to evaluate AI outputs critically, cite responsibly, and balance AI reliance with authentic language practice. Designing tasks that emphasize process over product, as recommended by professors, may reduce plagiarism and encourage genuine engagement. Teachers should also leverage AI as a scaffold to encourage student initiative while carefully monitoring its use to prevent dependency.

The study also draws attention to broader institutional implications. Universities must anticipate the growing presence of AI in education by developing clear policies on ethical use, providing professional development for teachers, and ensuring equitable access to AI tools. Without such measures, disparities in digital literacy and uncritical practices could undermine the positive potential of AI in fostering autonomy.

Nonetheless, the findings should be interpreted within certain limitations. The study was confined to Moroccan university EFL learners and a relatively small sample of professors, which may limit generalizability. In addition, while surveys and interviews provided rich data,

future research could integrate classroom observations or experimental designs to measure actual learning outcomes rather than self-reported perceptions. Longitudinal studies would also be valuable to examine how autonomy evolves over time in AI-rich learning environments.

6. Conclusion

This study contributes to ongoing debates about the role of AI in language education by examining its impact on learner autonomy among Moroccan EFL students. The findings confirm that AI tools can promote autonomy by enhancing motivation, critical analysis, and self-regulation. At the same time, both students and professors highlighted the risks of overdependence, diminished critical thinking, and ethical concerns such as plagiarism. These results affirm that AI is neither inherently supportive nor inherently detrimental; rather, its role depends on how it is integrated and mediated within pedagogical frameworks.

The study concludes that fostering learner autonomy in AI-mediated environments requires a balanced approach that integrates AI tools with explicit instruction in ethical and reflective practices. Teachers and higher education institutions must play a central role in cultivating AI literacy, promoting critical awareness, and designing learning activities that empower students to use AI as a resource rather than a substitute for learning. In this regard, universities should establish clear institutional policies and guidelines that define the ethical and responsible use of AI in academic contexts. Such policies should encourage transparency in AI-assisted work, reinforce the principles of academic integrity, and provide both students and instructors with guidance on the appropriate integration of AI technologies into teaching, learning, and assessment. Furthermore, professional development initiatives should equip educators with the skills needed to redesign assessment practices that foster originality, higher-order thinking, and responsible AI use. By adopting these measures, AI can be transformed from a potential obstacle into an opportunity, enabling learners to exercise greater agency, responsibility, and confidence in their EFL learning journeys while preserving the core values of academic integrity.

Ethical Approval and Considerations

All participants provided informed consent before participation. Ethical considerations were strictly observed, ensuring participants' rights, anonymity, and confidentiality were respected throughout the research process.

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