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Generative Artificial Intelligence in Education: The Case of Learning French as a Foreign Language at Moroccan Universities

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ABSTRACT: In a context of Moroccan higher education in the midst of a digital transformation, the integration of generative artificial intelligence (AIg) tools is giving rise to new learning dynamics, particularly in the field of foreign languages. The ESRI 2030 Pact, which aims to establish a model based on academic and scientific excellence while strengthening economic and social inclusion, highlights the digitalization of education and encourages the development of online learning. It is in this context that the growing use of smart tools, such as ChatGPT, in the learning of foreign languages and more particularly French as a Foreign Language (FLE) raises crucial questions about the way Moroccan students appropriate these new digital resources. While these tools offer considerable potential to improve the quality of written productions, particularly through grammatical and lexical correction, their adoption remains uneven. The impact of AIg varies depending on the level of user experience. While some students, especially those with an advanced level, seem to be able to fully exploit these technologies, others, less experienced, struggle to take advantage of them or make excessive use of them, sometimes without critical reflection. This study focuses on the exploration of the use of ChatGPT by Moroccan students of the Faculty of Sciences of Rabat (FSR) in their productions written in FLE. It is particularly interested in the way in which the appropriation of the tool varies according to the level of linguistic competence and the degree of digital maturity. Through a qualitative approach, the research seeks to highlight the differences in the use of generative artificial intelligence and to identify the factors that condition its effectiveness in improving the production of writing.

Keywords: Generative Artificial Intelligence (Generative Artificial Intelligence (gAI); ChatGPT; digital maturity; production of the written word; French as a foreign language (FLE); university students.

1. INTRODUCTION

The rise of generative artificial intelligence (gAI) is one of the major upheavals in higher education in the twenty-first century. International organisations highlight its potential for profound transformation: UNESCO (2024) insists on the need for ethical and inclusive ownership, while the OECD (2023) and the European Investment Bank see it as both an opportunity for innovation and a challenge in terms of educational governance (Cristol, 2019). This orientation is part of a broader trajectory carried by UNESCO, which first linked AI to the Sustainable Development Goals (Pedro, Subosa, Rivas & Valverde, 2019), then established a global normative framework with the Recommendation on the Ethics of Artificial Intelligence (UNESCO, 2021), before recently calling for inclusive and responsible use (UNESCO, 2024) and the adoption of coherent digital policies (UNESCO, 2025). In the same vein, the report of the French Commission on Artificial Intelligence highlights the importance of an ambitious educational and scientific strategy around AI (Aghion & Bouverot, 2024). Atkinson (2023) also emphasizes that higher education policies must integrate AI not only as a technical issue, but also as a lever for academic governance and equitable access to knowledge. Large-scale language models such as ChatGPT have become a major challenge for many higher education institutions (Cavenaghi & Senécal, 2019; Kurban & Şahin, 2024). On the educational front, Holmes et al. (2019, 2022) remind us that AI is not a simple technological tool, but a force for redefining the very purposes of education, by simultaneously questioning what to teach and how to teach. These developments are part of a Moroccan context marked by the ESRI 2030 Pact, which supports the digital transition of higher education and the adoption of student-centered hybrid pedagogies. However, the teaching of French as a foreign language (FLE) in Morocco still faces tensions between language policies, historical legacies and students' scientific expectations (Essaouri, Mabrour & Sadiqui, 2019). In this context, the introduction of AIg, particularly via ChatGPT, represents an opportunity but also a risk: an opportunity to individualize learning and support creativity (Shah, 2023), but risks weakening students' real autonomy by reinforcing cognitive dependency uses (Kurban & Şahin, 2024; Desveaud, 2024).

The recent literature highlights several critical axes. First, AIg transforms the nature of cognitive engagement: it facilitates access to contextualized knowledge but can reduce the effort of autonomous thinking if its use remains mechanical (Holmes, 2019). Second, it questions the issue of digital maturity (Forum IA Québec, 2021; UNESCO, 2022), understood as the ability of learners to critically and ethically integrate digital tools into their learning. Finally, it shakes up linguistic norms: while AI promotes grammatical correctness and discursive coherence, it can also produce standardized, smoothed texts that limit the expression of subjectivity and cultural diversity (Desveaud, 2024; Holmes, 2022). These questions are particularly relevant for Moroccan students in science (MIP, AI) for whom French remains both an academic language and a vector of access to scientific knowledge. Recent work (El Mouhtadi, Shlaka & Soughati, 2025a, 2025b) has shown that the use of ChatGPT in written production generates strong contrasts: advanced students (C1) use AI as a critical revision tool, while beginners (A2) tend to use it as a substitute for independent writing, thus revealing the importance of pedagogical support. These findings are in line with those of Popenici & Kerr (2017), who point out that AI, without critical guidance, risks promoting cognitive dependence and intellectual passivity. Similarly, Zawacki-Richter et al. (2019), in their systematic review, insist on the decisive role of teachers in integrating AI in a constructive way and preventing students from limiting themselves to a simple consumption of generated content. Finally, although written before the rise of generative AI, the work of Luckin et al. (2016) and Holmes, Bialik & Fadel (2019) underline that artificial intelligence can only truly become a lever for authentic learning if it strengthens the learner's reflexive capacity and autonomy, rather than replacing them.

Based on these observations, the present research aims to analyze the impact of generative AI on the learning of FLE in a hybrid system at the Faculty of Sciences of Rabat. It seeks both to contribute to the understanding of the real uses of AI by Moroccan university students and to question the conditions of a formative use that reinforces autonomy, digital maturity and creativity, rather than weakening them. The central question that guides this work is the following: to what extent does the use of generative artificial intelligence, and more specifically ChatGPT, really promote the development of writing skills in French as a foreign language among Moroccan science students, and how does this use vary according to their linguistic level and digital maturity?

Based on this question, two objectives are pursued: (1) to evaluate the concrete contribution of ChatGPT in the improvement of written productions in French as a foreign language at the Faculty of Sciences of Rabat; (2) identify the pedagogical and institutional conditions that make it a training tool, rather than a simple correction device or a factor of cognitive dependence.

2. MATERIALS AND METHODS

The methodological choice was gradually imposed, at the crossroads of three needs: to observe the real practices of students, to confront these uses with existing theoretical frameworks, and to understand the tensions that emerge from the integration of generative artificial intelligence (AIg) in the teaching of French as a foreign language. Rather than a rigid experimental protocol, the investigation was guided by an exploratory and situated approach.

The study was conducted at the Faculty of Sciences of Rabat, an institution that is part of the ESRI 2030 Pact, which makes digital transformation a strategic axis of the reform of Moroccan higher education. In this context, the IAg appears both as a promise and as an object of controversy. French retains a paradoxical place: a language of scientific knowledge, but perceived by many students as an obstacle to be overcome (Essaouri, Mabrour & Sadiqui, 2019).

The sample selected - sixteen first-year students from the MIP program - was not designed in terms of statistical representativeness, but rather as a window of observation on the diversity of postures in the face of AI. A placement test, aligned with the CEFR, highlighted two contrasting profiles: advanced students (C1) capable of using ChatGPT as a critical support, and beginner students (A2) who, on the contrary, tend to rely on it as a substitute for independent writing. This contrast, already noted in previous works (El Mouhtadi, Shlaka & Soughati, 2025a, 2025b), constitutes the heart of the analysis.

The survey system is based on an articulation between written production, interaction with the tool and reflexive discourse. The students were invited to write two texts of a similar nature: the first without digital assistance, the second with free use of ChatGPT. The traces left by their prompts were collected, as they say as much about the user's posture as the final text itself. Indeed, there are very general requests such as: "correct my text" which reflect an addiction, and more targeted requests such as: "propose a reformulation while avoiding repetition" which testify to a thoughtful and strategic use.

In addition to these textual data, semi-structured interviews and an extended questionnaire (316 usable responses, cf. RITPU survey, 2025) are used. The objective was not to produce an exhaustive quantification, but to enrich the qualitative understanding with a broader panorama of student representations: perception

of AI as an aid or as a threat, awareness of the risks of plagiarism, relationship to autonomy and the role of the teacher.

The analysis followed a logic of cross-referencing: comparing productions to identify linguistic transformations (coherence, lexicon, grammar), comparing the prompts with the texts to grasp the depth of cognitive engagement, and comparing these observations with the discourses collected in the interview. This triangulation has been informed by several theoretical frameworks: autonomy according to Holec (1981) and Ciekanski (2019), digital maturity defined by UNESCO (2022, 2024), and critical warnings on the risks of standardization (Desveaud, 2024; Holmes et al., 2022).

Finally, it is necessary to specify the limits of this approach. The small number of participants does not allow a generalization of the results, but allows a detailed reading of the practices. The novelty effect linked to ChatGPT may have accentuated certain behaviors of enthusiasm or rejection. Self-declaration also introduces biases, with some students tending to value or minimize their autonomy. But far from reducing the validity of the study, these limitations remind us that the use of AGI is not only measured in terms of linguistic effectiveness: it must be thought of as a situated practice, inscribed in a precise institutional, cultural and pedagogical framework.

3. RESULTS AND DISCUSSION

The texts produced by the students show clear differences between those written without AI and those written with the help of ChatGPT. Without assistance, many of the papers had grammatical errors, limited vocabulary and sometimes confusing organization. The introduction of AI has made it possible to quickly improve these aspects, but in different ways depending on the level of the students.

For the most advanced (C1), the tool has been used as a support to improve sentences, make the text more fluid and add vocabulary. In the papers, we can still see the student's style, the IAg does not completely replace their way of writing. In these copies, AI acted as a thought aid, an extension of critical revision. The lyrics have remained recognizable, with a style that retains the marks of the individual while gaining in precision.

For beginner students (A2), it's different. Where incorrect formulations, errors or clumsiness appeared in the first copy, there are now conforming but standardized turns of phrase, which betray an almost total delegation to the tool. The texts corrected by ChatGPT become correct in terms of language, but they look very similar and lose the personality of the student. In many cases, it seems that it was mainly the AI that wrote the text.

The analysis of the requests sent to the AI (the prompts) shows the same difference. The advanced ones asked specific questions, for example "rephrase this sentence" or "suggest a more suitable word". Beginners, on the other hand, limited themselves to general requests such as: "correct my text", which reflects a stronger dependence on the tool.

The interviews confirm these differences. Advanced students see ChatGPT as an aid that allows them to find avenues for reflection, to write faster and more clearly. Beginners, on the other hand, say that AI fills in their gaps in terms of understanding instructions, translating, looking for ideas, vocabulary, spelling saves them time, but some recognize that they learn less when they do the work mechanically without obligation. A few verbatims illustrate this:

"I use ChatGPT to search for ideas, a word, translate it or define it."
"ChatGPT gives me what to do when I don't understand the instruction."
"I use it especially when I don't have time to do an exercise, like French or English."

These words show that for many beginner students, ChatGPT is used above all as a quick fix to get around difficulties, rather than as a thoughtful learning tool.

Thus, AI seems to improve the quality of texts, but it would also reinforce the differences between students: those who already have a good autonomy take advantage of it to progress, while the most fragile risk developing a dependence on the tool.

The results of the study show that the use of generative artificial intelligence in written production is not homogeneous: advanced students (C1) use ChatGPT as a critical revision tool that supports their autonomy, while beginner students (A2) tend to delegate the task entirely to AI, producing correct but standardized texts. This contrast highlights two distinct learning postures, one focused on critical appropriation, the other on instrumental dependence. As Alaoui, Naffi and Collin (2023) remind us, the question is not only to integrate new tools into the classroom, but to accompany their appropriation with devices that support critical thinking and reduce the risks of purely mechanical use. These observations invite us to go beyond a strictly linguistic reading of the effects of AI to question the way in which students negotiate their relationship to the tool, oscillating between appropriation and delegation.

For advanced students, AI has played a role as a catalyst for reflexivity: it has made it possible to fluidify ideas, test reformulations and refine writing. In this case, ChatGPT did not replace the act of writing but accompanied it, functioning as a cognitive mirror. This posture illustrates what Holec (1981) and Benson (2013) refer to as authentic autonomy: not isolation, but the ability to take charge of one's learning by critically mobilizing available resources.

However, the productions of beginner students show a worrying homogenization: the sentences are grammatically correct but lack singularity and relief. The use of prompt waves reflects an almost total delegation of the task to the IAg. This illusory posture of autonomy is in line with the warnings formulated by Popenici & Kerr (2017) and Desveaud (2024) on the risk of superficial learning, where the student believes he is progressing when he or she is limited to consuming a generated text. Zawacki-Richter et al. (2019) confirm that, without pedagogical mediation, AI is still perceived as a simple solution provider rather than a learning lever. This tension between emancipation and dependence is part of the debate opened by Seldon and Abidoye (2018): does artificial intelligence constitute a liberating educational revolution or, on the contrary, a new form of infantilization of learners in the face of the machine?

This ambivalence is reinforced by the question of digital maturity. Students who are able to dialogue with the IAg, to question it, to reject some of its proposals and to keep others show that digital competence goes beyond simple technical mastery. It involves a critical and ethical dimension, as highlighted by UNESCO (2022, 2024). Conversely, a mechanical use of AIg produces cognitive dependency that weakens creativity and reduces the space for experimentation. These findings are in line with the recommendations (Alaoui et al., 2023), which call for the development of ethical and critical digital literacy, an essential condition for the use of AI in education to be beneficial and inclusive.

Beyond autonomy, another tension emerges: that of linguistic normativity. AI generates correct, compliant texts, often close to the expected academic standard. But this gain comes at the price of a standardization of style, especially among the less seasoned students. The work of Holmes et al. (2022) and Desveaud

(2024) reminds us that this standardization can impoverish individual expression and reduce cultural diversity. This is a central question for the teaching of French as a foreign language in Morocco: how to preserve the creativity and the learner's own voice while exploiting the corrective potential of AI?

Ultimately, the study shows that ChatGPT is not in itself a training or deformation tool: it all depends on the framework of use. When students benefit from pedagogical support and manage to distance themselves from the tool, it becomes a learning partner, a space for verification and revision. Conversely, without guidance, it risks producing texts without cognitive anchoring, where correction masks a lack of appropriation. This observation is in line with the work of Luckin et al. (2016), who recall that AI only becomes educational when it is integrated into systems that require the learner to be reflexively engaged.

These results resonate with the ambitions of the ESRI 2030 Pact, which places digital transformation and the development of critical skills at the heart of the Moroccan university project. They point out that the issue is not whether AI should be included in education, but how to integrate it in a way that supports students' creativity, autonomy and digital maturity, rather than weakening them.

4. CONCLUSION

The analysis carried out shows that generative artificial intelligence is an ambivalent lever for the learning of French as a foreign language in the Moroccan university context: it stimulates linguistic fluency and creativity, but it also risks reinforcing the technological dependence of the least autonomous students. These results confirm the findings of Holmes et al. (2023), who highlight the tension between pedagogical support and automation of cognitive tasks. This dual dynamic invites us to go beyond a strictly technocentric reading to consider AI as an educational resource requiring critical supervision.

The implications are multiple: on the pedagogical level, it is important to integrate digital maturity training systems so that students develop a reflective posture in front of tools (Cristol, 2019), and to promote "responsible use" practices, as defended by Cavenaghi and Senécal (2019). At the institutional level, universities must articulate the use of platforms with the objectives of the ESRI 2030 Pact, ensuring that learner autonomy is preserved as a key competence. Finally, on the scientific level, this research paves the way for new investigations into how generative AI redefines the balance between linguistic normativity and creativity in a multilingual context.

Ultimately, this study achieves its dual objective: to evaluate the concrete contribution of ChatGPT in the improvement of written productions in French as a foreign language and to identify the pedagogical and institutional conditions that make it possible to make it a training tool rather than a simple correction device.

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