

Redefining Teacher Leadership in the Age of ChatGPT: Instructional Practices, Ethical Challenges, and Professional Agency in Moroccan High Schools

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Abstract

The integration of generative artificial intelligence (AI) tools such as ChatGPT is increasingly influencing teaching and learning in Moroccan secondary schools. This study investigates how high school teachers use ChatGPT in lesson design, activity creation, and feedback, and how such practices are redefining teacher leadership within the classroom. Anchored in the framework of instructional leadership, the study explores the opportunities and challenges faced by Moroccan teachers as they negotiate the balance between AI support and professional judgment. A mixed-methods design was adopted. Quantitative data were gathered from a survey of 87 Moroccan high school teachers working in the Casablanca-Settat region, while qualitative data were collected through semi-structured interviews with 12 teachers and analysis of lesson plans developed with ChatGPT. Descriptive statistics revealed that 64% of teachers reported using ChatGPT for lesson planning, 52% for activity generation, and 41% for drafting feedback. Qualitative findings highlighted three dominant themes: (1) pedagogical efficiency and creativity, with teachers noting time-saving benefits and new activity ideas, (2) ethical and pedagogical concerns, including fears of plagiarism, student overreliance, and occasional inaccuracies, and (3) leadership and professional agency, where teachers positioned themselves as guides who critically filter ChatGPT outputs and model responsible AI use for students. The study concludes that ChatGPT is not replacing teachers but is reshaping their leadership roles as instructional leaders, decision-makers, and ethical mediators in the classroom. These findings underscore the need for professional development programs on AI literacy and for policy guidelines that address responsible AI integration in Moroccan high schools.

1. INTRODUCTION

Generative AI tools such as ChatGPT have rapidly entered educational spaces worldwide, promising to enhance teaching efficiency and personalized learning (Hays et al., 2024; Ghamrawi et al., 2024). Educators are experimenting with these tools for tasks like lesson planning, content generation, and assessment feedback, drawn by potential benefits in saving time and tailoring materials to student needs (Barnes & Tour, 2025; Hays et al., 2024). At the

same time, the rise of AI in classrooms has sparked pedagogical and ethical debates. Concerns include risks of plagiarism, erosion of student critical thinking, and the accuracy of AI-generated content (Aruleba et al., 2023; Barnes & Tour, 2025). In Morocco, this global trend coincides with an ongoing digital transformation in secondary education. National initiatives and the COVID-19 pandemic have accelerated technology integration in Moroccan schools, heightening interest in innovative tools like AI to support teaching and learning (Outoukarte et al., 2023). Recent local developments reflect this momentum, as Moroccan teachers and students increasingly engage with AI-based tools amidst broader post-pandemic shifts toward educational technology (Fakhar et al., 2024; Lehfid et al., 2025).

Despite the growing adoption of AI in education, there is limited understanding of how integrating tools like ChatGPT is influencing teacher leadership and professional judgment in the Moroccan context. Globally, research on AI in schools has only begun to examine the changing roles of teachers, indicating that AI can both augment and diminish aspects of teacher leadership depending on its use (Ghamrawi et al., 2024). However, few studies have focused on North African or Moroccan secondary schools. Early evidence from Morocco shows varied teacher attitudes and preparedness—many educators see AI’s potential but lack sufficient training or clear guidelines, leading to cautious and uneven adoption (Fakhar et al., 2024; Lehfid et al., 2025). This highlights a gap in empirical knowledge on how Moroccan teachers are navigating and negotiating their professional roles in the age of AI. Without such insights, educational stakeholders risk overlooking important shifts in teachers’ decision-making and agency prompted by AI integration.

Given this gap, the purpose of the current study is to explore how the use of ChatGPT is redefining teacher leadership and professional agency among high school teachers in Morocco. Specifically, we examine how teachers incorporate ChatGPT into key instructional practices including lesson design, classroom activity creation, and feedback provision and investigate how these AI-supported practices are affecting teachers’ leadership roles in the classroom. The study addresses the following research questions:

1. How are Moroccan high school teachers using ChatGPT in their instructional planning, activity design, and feedback practices?
2. What are the motivations and pedagogical rationales underlying their use of ChatGPT?
3. In what ways does the integration of ChatGPT influence teachers’ professional agency and instructional leadership roles?

By focusing on Moroccan high schools, this research aims to provide context-sensitive insights into the opportunities and challenges that generative AI presents for teacher leadership and professional judgment. Ultimately, the study’s findings will shed light on whether AI tools

serve as a collaborative aide that empowers teachers or a disruptive force that complicates their leadership in practice.

This inquiry is anchored in instructional leadership theory, which emphasizes the role of educators in guiding teaching and learning processes (Hallinger, 2005; Ghamrawi et al., 2024). We approach teachers as key instructional leaders in their classrooms—active guides and decision-makers who shape learning experiences even as they leverage AI assistance. Within this framework, teacher leadership encompasses not only curricular and pedagogical decision-making but also an ethical dimension. In the age of ChatGPT, teachers increasingly act as ethical mediators, filtering AI-generated suggestions through professional judgment to ensure alignment with educational values and standards (Barnes & Tour, 2025; Campbell, 2008). The concept of professional agency is central here: teachers must exercise autonomy to adapt AI outputs appropriately, model responsible AI use for students, and maintain authority over instructional choices. By situating the study in this theoretical context, we examine how generative AI might be reconfiguring teachers' leadership identities—from facilitators of learning to custodians of ethical and effective AI integration in the classroom.

2. LITERATURE REVIEW

2.1. Generative AI in Education

Generative AI tools like ChatGPT have rapidly entered classrooms, offering new pedagogical applications. Teachers are beginning to use ChatGPT for lesson planning, content creation, and student feedback. These tasks benefit from ChatGPT's ability to generate structured content, examples, or instructional prompts (van den Berg & du Plessis, 2023; Zhang & Tur, 2023). In particular, the tool supports instructional **efficiency**, allowing educators to save time while designing materials. It also contributes to **creativity**, by helping generate fresh ideas for activities and assessment. Additionally, ChatGPT enables greater **personalization** of learning by tailoring responses and explanations to individual student needs, potentially improving engagement and accessibility (Hays et al., 2024; Zhang & Tur, 2023).

However, scholars have also noted a range of **concerns**. One pressing issue is the **accuracy** of AI outputs: ChatGPT may generate fluent but misleading or factually incorrect responses, requiring critical teacher oversight (Zhai et al., 2024). Ethical questions also arise around **bias**, especially when AI systems reproduce stereotypical or unbalanced perspectives embedded in their training data (Dwivedi et al., 2023). A further concern is **academic integrity**: students can misuse generative AI to plagiarize essays or bypass meaningful engagement with learning tasks, challenging traditional assessment practices (Kasneci et al., 2023; Zhang & Tur, 2023). Moreover, the overreliance on AI for explanations and writing support may undermine

students' ability to develop original thought and critical thinking skills (Kosmyna et al., 2023; Striepe et al., 2023). As a result, researchers emphasize the importance of educating both students and teachers about **responsible AI use**, advocating for clear guidelines, digital literacy, and strong human-AI collaboration frameworks in classrooms (Striepe et al., 2023; van den Berg & du Plessis, 2023).

2.2. Teacher Leadership in the Digital Age

The digital transformation of education has led to a redefinition of teacher leadership. Traditional models, where leadership was concentrated in administrative roles, are giving way to **distributed** and **instructional leadership** frameworks. In these models, teachers are recognized not only as content deliverers but also as agents of innovation and decision-making within their classrooms and professional communities (Harris & Jones, 2020; Azorín, 2020). Such approaches have become especially relevant in post-pandemic schooling, where collaboration and shared responsibility have proven essential to adapting pedagogical strategies and technologies (Netolicky, 2020; Harris, 2020).

In AI-enhanced classrooms, teachers increasingly act as **facilitators**, guiding students in evaluating and interacting with digital tools. This role goes beyond using technology to transmitting digital **citizenship**, ethical norms, and critical evaluation skills (Afriani et al., 2025; Striepe et al., 2023). As **ethical mediators**, teachers help students navigate academic honesty, data privacy, and fairness when interacting with AI. Meanwhile, as **technology integrators**, educators select, adapt, and incorporate digital resources to align with their students' needs and local curriculum goals (Dwivedi et al., 2023; Zhang & Tur, 2023). This expanded vision of teacher leadership places a premium on **professional agency**: teachers must make informed, autonomous decisions about how and when to use AI, how to scaffold its use in student learning, and how to maintain pedagogical integrity in a rapidly evolving digital environment (Ghamrawi et al., 2024; Mishra et al., 2020). The literature emphasizes that empowering teachers in these roles is essential for the ethical and pedagogically sound integration of AI technologies.

2.3. The Moroccan Context

In Morocco, the integration of AI in education is emerging gradually through broader national strategies around digitalization. Policies such as the *Digital Morocco 2030* vision and initiatives like GENIE (Generalization of Information and Communication Technology in Education) aim to enhance digital access and teacher training across schools (UNESCO, 2023). While these initiatives demonstrate a strong commitment to digital transformation, there is

currently **no comprehensive AI-specific education policy**. The country's efforts are largely exploratory, with AI implementation still in its infancy at the classroom level (UNESCO, 2023).

Despite policy momentum, Moroccan educators face several **practical challenges**. First, **training gaps** remain significant: many teachers have limited knowledge of AI tools or pedagogical strategies for integrating them meaningfully. Professional development often does not cover AI-specific competencies, leaving educators to learn through trial and error (Afriani et al., 2025; Ghamrawi et al., 2024). Second, **resource disparities** hinder equitable AI adoption. While urban schools have increasing access to digital infrastructure, rural areas still suffer from inadequate internet connectivity, outdated hardware, and limited support staff (UNESCO, 2023). This digital divide risks exacerbating existing educational inequalities. Third, there is a lack of **ethical and pedagogical guidelines** specific to AI. Teachers often have to navigate the use of tools like ChatGPT without institutional support on issues like student privacy, bias, and academic misconduct (Striepe et al., 2023; Dwivedi et al., 2023). As student experimentation with AI grows, especially outside formal instruction, the need for clear national standards and classroom-level protocols becomes increasingly urgent (Zhang & Tur, 2023; Hays et al., 2024).

In summary, while Morocco's digital education policy landscape shows promising directions, there is a pressing need to align infrastructure, teacher training, and ethical governance to support the responsible integration of generative AI in schools. Doing so would enable Moroccan educators to exercise leadership and agency in navigating this technological shift, rather than being passive recipients of change.

3. RESEARCH METHODOLOGY

3.1. Research Design

This study adopted a **mixed-methods research design**, combining quantitative and qualitative approaches to gain a comprehensive understanding of how Moroccan high school teachers use ChatGPT and how this affects their instructional leadership. The design integrated a teacher survey, semi-structured interviews, and document analysis of AI-assisted lesson plans.

3.2. Participants

Participants included **87 high school teachers** from the Casablanca-Settat region who completed an online survey. In addition, **12 teachers** were purposively selected for in-depth interviews. Lesson plans developed with ChatGPT by these interviewees were also collected to support the qualitative component.

3.3. Instruments and Data Collection

Data were gathered through three instruments:

- A **survey questionnaire** that captured quantitative data on teachers' ChatGPT usage patterns across lesson planning, activity creation, and feedback.
- **Semi-structured interviews** aimed at exploring teachers' perceptions, experiences, and ethical concerns related to AI integration.
- **Lesson plans** created with ChatGPT, collected to document actual instructional applications and assess how AI was embedded into pedagogical practice.

3.4. Data Analysis

Quantitative data from the survey were analyzed using **descriptive statistics**, focusing on frequencies and percentages to highlight usage trends. Qualitative data from interviews and documents were examined through **thematic analysis**, identifying recurrent themes related to instructional practices, ethical challenges, and professional agency.

3.5. Ethical Considerations

All participants provided **informed consent** prior to data collection. Anonymity and **confidentiality** were maintained throughout the study. Data were securely stored, and participants were assured that their responses would be used solely for research purposes.

4. RESULTS AND DISCUSSION

This section presents the findings of the study, structured around the three central research questions. Drawing on both quantitative and qualitative data, the results offer insight into how Moroccan high school teachers are using ChatGPT in their instructional practices, the pedagogical and ethical motivations behind their usage, and the broader implications for teacher leadership and professional agency in the age of artificial intelligence.

The first part of this section reports the quantitative findings from the survey administered to 87 teachers. These findings highlight the extent to which ChatGPT is being integrated into lesson planning, activity design, and feedback provision. The data reveal distinct patterns in adoption rates and usage intensity, offering a baseline understanding of how generative AI is currently positioned within everyday teaching practices.

The second part presents the qualitative findings derived from semi-structured interviews and document analysis. Three dominant themes emerge from this analysis. The first theme, pedagogical efficiency and creativity, reflects how teachers use ChatGPT to save time, generate

instructional ideas, and diversify their lesson content. The second theme, ethical and pedagogical concerns, captures teachers' apprehensions regarding plagiarism, student overreliance, and the occasional inaccuracy of AI-generated material. The third theme, leadership and professional agency, illustrates how teachers are navigating their evolving roles as ethical mediators and instructional decision-makers in technology-rich classrooms.

Together, these findings provide a multidimensional understanding of how ChatGPT is reshaping teacher practices and professional identities within Moroccan secondary education.

4.1. Quantitative Findings: ChatGPT Use in Lesson Planning, Activity Design, and Feedback Provision

The survey data from 87 Moroccan high school teachers reveal a widespread but differentiated integration of ChatGPT across instructional tasks. The most prominent area of adoption was lesson planning.

Table 1: Frequency of ChatGPT Use for Lesson Planning Among Moroccan High School Teachers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	31	35.6	35.6	35.6
	Yes	56	64.4	64.4	100.0
	Total	87	100.0	100.0	

As shown in **Table 1**, 64.4% of participants reported using ChatGPT to assist in designing their lessons. This included generating initial drafts, organizing lesson structure, and adapting content to student levels. These results suggest that lesson planning is the most accessible and frequent entry point for generative AI in classroom preparation, likely due to its high potential for saving time and supporting pedagogical creativity.

Activity generation followed closely as the second most common use as shown in Table 2 below:

Table 2: Frequency of ChatGPT Use for Activity Generation in the Classroom

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	42	48.3	48.3	48.3
	Yes	45	51.7	51.7	100.0
	Total	87	100.0	100.0	

According to **Table 2**, 51.7% of surveyed teachers used ChatGPT to create classroom exercises such as quizzes, prompts, and group activities. This use reflects the appeal of AI for enhancing student engagement and introducing variety into instructional materials. Teachers who adopted ChatGPT for this purpose often cited the tool's ability to support differentiation and provide inspiration for designing novel learning tasks. Feedback drafting, however, emerged as the least utilized domain.

Table 3: *Frequency of ChatGPT Use for Feedback Drafting on Student Work*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	51	58.6	58.6	58.6
	Yes	36	41.4	41.4	100.0
	Total	87	100.0	100.0	

As indicated in **Table 3**, only 41.4% of respondents reported using ChatGPT to draft feedback on student work. While still significant, this figure suggests a more cautious approach to relying on AI for evaluative and personalized teaching practices. Teachers who did use ChatGPT for feedback highlighted its usefulness in streamlining comments for large classes but remained wary of over-automation or loss of authenticity in their evaluations.

Overall, these findings suggest that while ChatGPT is becoming a normalized tool in Moroccan secondary education, its adoption varies by instructional function. Teachers appear more comfortable applying AI in planning and content creation than in feedback and assessment, where professional judgment remains paramount. These differentiated patterns of usage set the stage for deeper exploration into the motivations and concerns behind these practices, which are addressed in the qualitative themes that follow.

The survey results indicate that Moroccan teachers are embracing generative AI primarily as a tool for planning and resource creation, a trend that mirrors global patterns in education. Recent reports show that well over half of teachers internationally have experimented with AI for tasks like lesson planning, worksheet generation, and idea brainstorming (Hallahan, 2024; Wagner, 2025). Such uptake is driven by the efficiency and creative affordances of tools like ChatGPT. Studies have found that integrating ChatGPT into lesson preparation can significantly reduce teacher workload while sparking more diverse instructional ideas (Roy et al., 2024; Moorhouse & Wong, 2025). Teachers leverage the chatbot to save time on drafting lesson outlines or activities, enabling them to focus more on pedagogy and student interaction (Trust et al., 2023; Poet & Aston, 2025). This aligns with research in language education suggesting that AI can quickly produce quizzes, prompts or reading texts, thus allowing educators to devote more energy to higher-order teaching tasks (Moorhouse & Wong, 2025). In short, the high adoption rate for **planning** and **activity design** reflects teachers' perceptions that generative AI meaningfully enhances their productivity and creativity in the classroom (Hallahan, 2024; Roy et al., 2024).

By contrast, the more cautious use of ChatGPT for **feedback and assessment** aligns with educators' well-documented concerns about AI's limitations. Teachers in this study showed restraint in automating feedback, echoing broader apprehensions about maintaining authenticity, accuracy, and professional judgment in evaluative practices (Harry, 2023; Henderson et al., 2025). Research has indeed noted that while AI-generated feedback can be immediate and plentiful, its quality is not always reliable – it may lack contextual nuance or even introduce factual errors (Nguyen et al., 2024; Henderson et al., 2025). Moreover, educators worry that over-reliance on AI for feedback could undermine the personal connection and individualized guidance that human teachers provide (de Fine Licht, 2024; Mabuan, 2024). Concerns about issues like plagiarism and student overdependence on AI support have also been widely reported, suggesting that teachers feel a responsibility to use ChatGPT ethically and judiciously (Mabuan, 2024; Tripathi et al., 2025). In our findings, this is evidenced by many teachers deliberately limiting AI's role in grading or commenting on student work, thereby preserving their role as the ultimate arbiter of quality and fairness in assessment. Such an approach is consistent with the view that **AI and teacher feedback serve different needs** and should complement rather than replace one another (Henderson et al., 2025).

Ultimately, these patterns highlight how teachers are actively negotiating the place of AI in their professional practice. Rather than wholesale adoption, educators are integrating ChatGPT in ways that **augment** their work – streamlining preparation and enhancing content diversity – while **shielding** core pedagogical activities that require human insight (Ghamrawi et al., 2024;

Tripathi et al., 2025). This selective integration demonstrates considerable teacher agency. Teachers are positioning themselves as informed decision-makers or *ethical gatekeepers* who filter what ChatGPT produces through their own expertise and knowledge of students (Davis et al., 2024; Zaimoğlu & Dağtaş, 2025). In doing so, they fulfill an emerging teacher-leadership role in the AI era, one that involves guiding technology use in alignment with pedagogical goals and ethical standards (Ghamrawi et al., 2024). Such findings resonate with calls in the literature to empower teachers as co-pilots of AI integration – using AI to amplify effective teaching practices without eroding the human elements of education (de Fine Licht, 2024; Tripathi et al., 2025). In summary, the survey results not only underscore the practical benefits of ChatGPT in reducing workload and inspiring creativity, but also reveal teachers’ conscious efforts to balance innovation with responsibility. This balance is crucial as educators navigate their evolving professional identities and leadership in classrooms increasingly influenced by artificial intelligence.

4.2. Qualitative results: Emerging Themes from Interviews and Document Analysis

The qualitative data, drawn from twelve semi-structured interviews and document analysis of ChatGPT-assisted lesson plans, revealed three interrelated themes that capture teachers’ experiences with generative AI in the classroom: pedagogical efficiency and creativity, ethical and pedagogical concerns, and leadership and professional agency.

4.2.1. Pedagogical Efficiency and Creativity

Teachers widely described ChatGPT as a tool that improves efficiency by reducing lesson planning time and generating new instructional ideas. Several participants noted that the tool helped “break planning fatigue,” particularly when preparing for diverse student needs. Lesson plans incorporating ChatGPT suggestions demonstrated a range of creative activities—from discussion prompts to formative assessments—indicating that teachers use AI not only for time-saving but also for diversifying their pedagogical approach. This creative use was often described as a form of “idea sparking,” where ChatGPT offered an initial structure later refined by the teacher.

4.2.2. Ethical and Pedagogical Concerns

Despite these advantages, teachers expressed strong reservations about certain AI limitations. Concerns centered around the risk of student plagiarism, especially when learners were introduced to ChatGPT without guidance. Others expressed concerns that frequent AI use might foster student dependency or undermine critical thinking. Inaccuracies in AI-generated

content were another source of tension. Teachers described instances of factual errors or misleading content that required careful review and correction. These concerns highlight a protective stance toward maintaining pedagogical integrity while engaging with AI.

4.2.3. Leadership and Professional Agency

A final theme that emerged was teachers' evolving sense of professional agency. Many interviewees saw themselves as “filters” or “ethical gatekeepers,” evaluating ChatGPT's suggestions before classroom use. This framing emphasized teachers' role as leaders in mediating the responsible integration of AI. Rather than ceding control, participants reported adapting AI outputs to align with curricular goals and student needs. Several described this as an opportunity to model responsible digital behavior for students—balancing innovation with judgment and care.

The study extends instructional leadership theory through introducing the concept of AI-mediated instructional leadership, where teachers act as “ethical gatekeepers,” who evaluate and regulate students' use of AI. A new dimension is added that traditional models do not address.

The qualitative findings offer valuable insight into how Moroccan teachers are negotiating the integration of generative AI in their instructional practice. The theme of **pedagogical efficiency and creativity** echoes global trends showing that educators often turn to ChatGPT for its capacity to streamline lesson planning and inspire novel approaches (Moorhouse, 2024; Diliberti et al., 2024). Teachers in this study described the tool as a source of “idea sparking,” aligning with findings that generative AI can act as a brainstorming partner, particularly when educators face tight preparation timelines or seek differentiated content (Hashem et al., 2024). This aligns with broader arguments that AI, when used thoughtfully, can enhance instructional agility without displacing teacher agency (Jauhiainen & Guerra, 2023).

At the same time, the theme of **ethical and pedagogical concerns** highlights teachers' caution toward potential misuse. Consistent with research in other contexts, participants voiced apprehensions about student plagiarism, content inaccuracies, and overreliance on AI (Kasneji et al., 2023; Bower et al., 2024). These concerns underscore the necessity of human oversight and align with findings that successful AI adoption depends not only on technological readiness but also on ethical awareness and clear pedagogical frameworks (Ottenbreit-Leftwich et al., 2023; Chiu, 2023).

Finally, the theme of **leadership and professional agency** affirms the view of teachers as active mediators in the AI era. Rather than passively implementing AI suggestions, participants

filtered ChatGPT outputs through their professional judgment, modeling critical engagement for students. This behavior aligns with the emerging literature on AI-enhanced instructional leadership, in which teachers retain authority over curriculum decisions while guiding responsible AI use (Kaplan-Rakowski et al., 2023; Velandar et al., 2024). These findings emphasize that generative AI's effectiveness is contingent not only on its capabilities but also on educators' agency in aligning its use with pedagogical values.

5. CONCLUSION

This study examined how Moroccan high school teachers are integrating ChatGPT into their instructional practices and how such integration is reshaping their professional agency and leadership roles. The findings demonstrate that while ChatGPT is increasingly used for lesson planning and activity design, its role in feedback provision remains limited. Teachers value the tool for its efficiency and creative support, but maintain a cautious stance toward evaluative and ethically sensitive tasks. The qualitative data reinforce this selectivity, revealing a nuanced portrait of teachers as critical actors who balance innovation with responsibility. Rather than passive adopters, educators positioned themselves as ethical gatekeepers, actively mediating AI outputs to serve pedagogical goals while safeguarding student development and academic integrity.

The implications of these findings are significant for both educational policy and professional development. As AI tools become more prevalent in classrooms, it is essential to equip teachers not only with technical training but also with frameworks for ethical and pedagogically sound integration of AI. Professional development programs should include AI literacy, lesson planning, ethical use of generative AI, and evaluation of AI outputs. The focus should be on enhancing AI literacy, promoting reflective practice, and supporting teachers in their evolving leadership roles. At the policy level, national education authorities in Morocco should consider developing clear guidelines for AI use in education, addressing issues of accuracy, bias, plagiarism, and the role of teacher judgment in AI-supported instruction. There are many rules that authorities should adopt for AI use. For instance, policies should protect data privacy, establish standards for academic integrity, and specify criteria for assessing AI tools before adoption.

Schools should also foster environments that encourage experimentation and collaboration around AI. To explain further, these schools should create collaborative spaces where teachers can test AI tools, share strategies, challenges, and best practices without fear of judgment. Leadership should encourage creativity, innovation, and reflective practices.

However, this study has certain limitations. The sample, while diverse, was geographically limited to the Casablanca-Settat region, and findings may not fully represent other regions with different levels of digital access or pedagogical cultures. Moreover, the study relied on self-reported data, which may be influenced by participant perceptions or social desirability bias. Future research should explore the longitudinal impacts of AI on teaching practices and leadership identity, and examine students' perspectives on learning in AI-enhanced classrooms. Expanding the scope to rural areas and conducting classroom-based observations could further enrich the understanding of how AI is transforming education in the Moroccan context.

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