T I E Journal
Volume 3 Issue 3, 2025
http://ijtie.com/v303/n30345
ISSN: 2820-7521

The International Journal of Technology, Innovation, & Education

ChatGPT in the eyes of learners: Perceived benefits, impacts, and challenges among Moroccan secondary school students

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Received: August 17, 2025; **Accepted**: September 10, 2025; **Published**: October 05, 2025

Abstract

This study explores Moroccan secondary school students' perceptions of ChatGPT, focusing on its perceived benefits, impacts, and challenges in learning across subjects including languages, science, and history. Guided by three research questions, data were collected through semi-structured interviews with 18 students from public high schools in Sidi Bennour, Morocco, and analyzed using Braun and Clarke's thematic analysis framework. Findings reveal that students perceived ChatGPT as beneficial for providing instant and clear explanations, supporting personalized and autonomous learning, and assisting with language and writing tasks. The tool was also found to influence study behaviors by increasing motivation and improving time management, though concerns of overreliance and passive learning emerged. Students expressed reservations regarding accuracy, fear of dependency, and unequal access due to digital divides. These results suggest that while ChatGPT can enrich learning and empower student autonomy, its integration in secondary education requires careful pedagogical framing, infrastructure support, and AI literacy initiatives to address associated risks. The study contributes to the limited body of research on AI use in secondary education in the Global South and provides practical insights for educators, policymakers, and curriculum designers seeking to balance the opportunities and challenges of AI integration in classrooms.

Keywords: ChatGPT, artificial intelligence in education, secondary school students, learner perceptions, Morocco.

Farhane, H. (2025) ChatGPT in the eyes of learners: Perceived benefits, impacts, and challenges among Moroccan secondary school students. *The International Journal of Technology, Innovation, and Education, 3*(3), 35–57. https://ijtie.com/v303/n30345

1. Introduction

In recent years, artificial intelligence (AI) has emerged as a transformative force in education. Among the most prominent AI tools is ChatGPT, developed by OpenAI in 2022, which allows users to engage in natural language conversations, generate written content, and receive instant explanations on a wide range of topics. ChatGPT's capacity to act as a writing assistant, tutor, or study partner has made it highly attractive to learners across age groups. A comprehensive meta-analysis by Wang and Fan (2025), based on 51 quasi-experimental studies, found that ChatGPT significantly improves students' learning performance ($g = 0.867$), learning perception ($g = 0.456$), and higher-order thinking skills ($g = 0.457$). These findings suggest that generative AI, when integrated meaningfully into learning environments, can enhance cognitive, affective, and metacognitive outcomes. Other studies reinforce the pedagogical value of ChatGPT, particularly in supporting students' affective engagement and motivation. Deng et al. (2025), in a systematic review of ChatGPT in education, concluded that students benefit from real-time feedback, personalized support, and increased confidence in exploring new material. Similarly, Heung and Chiu (2025) highlighted ChatGPT's ability to promote student engagement across behavioral, emotional, and cognitive domains. However, the rapid uptake of ChatGPT also raises critical concerns. Forero and Herrera-Suárez (2024) found that students may rely too heavily on ChatGPT for answers without fully engaging in independent problem-solving, particularly in subjects requiring precise reasoning such as physics. Broader literature also warns against potential challenges, including plagiarism, diminished critical thinking, and the ethical implications of AI-generated content (Deng et al., 2025).

In Morocco, the integration of AI in education aligns with national strategies that promote digital innovation and educational reform. The 2015–2030 Strategic Vision for Education calls for modernizing the school system by incorporating technological tools that foster autonomy, equity, and quality learning (El Khayati, 2025). While most research and AI-based initiatives in Morocco have focused on higher education and teacher training, there is growing recognition of the need to explore AI use among secondary school learners. As digital access expands and students increasingly use mobile technologies, generative AI tools such as ChatGPT are becoming part of learners' informal study routines. Moukhliss et al., (2024) emphasizes that AI is beginning to reshape the Moroccan educational landscape by altering how students interact with content and how teachers design instruction, even though formal policies for secondary-level integration are still emerging. Despite ChatGPT's growing presence in learners' academic

lives, especially among adolescents, there remains a significant gap in empirical research exploring students' perceptions of this technology at the secondary level. Most existing studies have focused on university populations or generalized teacher perspectives. Yet student perceptions are essential for understanding how and why educational tools are adopted, used, or rejected. By focusing on secondary school students in Morocco, this study seeks to capture how young learners perceive the role of ChatGPT in their education, what benefits they attribute to it, how they believe it affects their academic behavior, and what concerns or challenges they associate with its use.

The aim of this study is to explore Moroccan secondary school students' perceptions of ChatGPT by focusing on three core dimensions: (1) the perceived benefits of ChatGPT in supporting learning, (2) the perceived impacts of ChatGPT on study habits, motivation, and academic outcomes, and (3) the perceived challenges and risks associated with its use. Through qualitative inquiry, the research seeks to provide rich, context-sensitive insights into how secondary students engage with generative AI outside formal instruction. This study contributes to both the academic literature and practical educational discourse. It extends existing research on ChatGPT by centering underrepresented demographics, and thus broadening global understandings of AI in education. It also provides policymakers, educators, and curriculum developers with first-hand insights into students' actual experiences with ChatGPT, which can inform the development of pedagogical frameworks, AI literacy initiatives, and ethical usage guidelines tailored to the secondary education level. This study also uncovers a central paradox: students embrace ChatGPT as a means of enhancing autonomy and accessing judgment-free explanations, yet they remain cautious about the risks of cognitive dependency and accuracy. Framing the study through this tension between empowerment and dependency provides a richer understanding of the role of generative AI in Moroccan secondary education (Labadze et al., 2023; Giannakos et al., 2024; Ismaili, 2024).

To guide the study, the following research questions were formulated:

- **RQ1**: What benefits do Moroccan secondary school students perceive from using ChatGPT as a learning tool?
- **RQ2**: How do these students perceive the impact of ChatGPT on their learning processes, study habits, and academic outcomes?
- **RQ3**: What challenges or concerns do Moroccan secondary students report regarding their use of ChatGPT in educational contexts?

The remainder of this paper is structured as follows. Section 2 reviews key literature on generative AI in education, student engagement, and Morocco's digital reform agenda. Section 3 outlines the qualitative methodology employed, including participant selection and thematic analysis. Section 4 presents the results according to the three focus areas: perceived benefits, perceived impacts, and perceived challenges. Section 5 discusses the findings in light of existing research, and Section 6 concludes with recommendations and implications for future practice and research.

2. Literature Review

2.1. ChatGPT in Educational Contexts

Since its release in late 2022, ChatGPT has generated considerable interest in educational settings due to its conversational capabilities, language generation power, and accessibility. As an advanced large language model, ChatGPT is capable of assisting learners by explaining difficult concepts, generating examples, revising writing, and answering questions across a wide range of subjects. Its growing adoption has prompted empirical investigations into its impact on academic outcomes and classroom practices. Wang and Fan (2025) conducted a meta-analysis of 51 quasi-experimental studies and reported a significant positive effect of ChatGPT on students' learning performance, with an average effect size close to 0.87. Their study also highlighted moderate improvements in students' learning perceptions and higher-order thinking, underscoring the pedagogical promise of generative AI in academic contexts. These findings have sparked global interest in incorporating ChatGPT into instructional design, especially in higher education institutions where students often use AI tools for writing assistance, research, and content generation.

Complementary evidence from Deng, Qian, and Hu (2025) confirms that ChatGPT supports student learning through increased motivation, personalized feedback, and reduced cognitive effort. Their systematic review showed that learners benefit from interacting with ChatGPT to complete assignments, brainstorm ideas, and improve writing quality. These affordances contribute to more learner-centered environments and may enhance self-regulated learning. The expansion of ChatGPT into secondary education is still in early stages but growing steadily. Munaye et al. (2025), in a systematic review of 40 studies, found that although ChatGPT has been primarily adopted in tertiary education, informal use among secondary students is rising. Learners increasingly turn to the tool for help with homework, test preparation, and language

learning often without formal guidance from teachers or institutions. This self-directed use highlights the need for more research into how younger students engage with and perceive the technology. Institutional and psychological factors also influence how ChatGPT is adopted. Shahzad, Xu, and Javed (2024) found that university students' trust in ChatGPT, perceived usefulness, and ease of use were strong predictors of adoption intention. These findings suggest that attitudes toward AI are shaped not only by its technical capabilities but also by users' confidence in its reliability and academic value. While their study focused on higher education, the implications for secondary learners are relevant; trust and digital competence likely play a central role in how adolescents evaluate and use AI tools like ChatGPT.

2.2. Student Perceptions of AI Tools

Research shows that students generally hold positive perceptions of ChatGPT when it offers timely, accessible support for academic tasks. In a survey of 737 undergraduate students in Spain, Blahopoulou and Ortiz-Bonnin (2025) found that users valued ChatGPT's constant availability and time-saving potential, while non-users expressed more skepticism especially about academic integrity and the devaluation of educational rigor. This study highlights significant attitudinal differences between users and non-users and underscores the importance of student involvement in policy development. Similarly, Chan and Hu (2023) studied 399 students in Hong Kong and reported overall favorable views of generative AI. Students appreciated its usefulness for personalized learning support, brainstorming, writing assistance, and information synthesis. However, they also voiced concerns about accuracy, privacy, ethical issues, and the potential negative effects on personal growth and learning habits.

Higher education students in diverse contexts report similar sentiments. Stöhr et al. (2024) surveyed learners about various AI chatbots including ChatGPT and documented that most users viewed AI assistance as helpful for assignments and concept clarification. Yet many also indicated reservations about dependency and the adequacy of chatbot responses for complex academic tasks. In a study using structural models, Acosta-Enriquez et al. (2024) surveyed dozens of Generation Z college students and found notable concerns about ChatGPT's ethical use and accuracy; though most appreciated its utility for drafting outlines and providing study support. These findings suggest that while students see clear value in ChatGPT, their attitudes are nuanced. They welcome its efficiency, clarity, and idea generation capabilities, but remain cautious about reliability and ethical pitfalls. Importantly, these perceptions may vary

depending on factors such as prior digital experience, subject background, and whether institutional support or clear AI-use policies are present.

2.3. Benefits and Pedagogical Potential of ChatGPT

Recent empirical studies highlight several pedagogical benefits associated with ChatGPT, particularly in supporting personalized learning, writing development, and student motivation. Wang and Fan (2025), through a large-scale meta-analysis of 51 quasi-experimental studies, found that students who engaged with ChatGPT exhibited significantly improved academic performance, as well as moderate enhancements in learning perception and critical thinking skills. These gains suggest that ChatGPT has considerable potential to promote deeper cognitive engagement when used in structured educational contexts. Deng, Qian, and Hu (2025), in a systematic review, reported that learners frequently benefit from ChatGPT's ability to provide immediate explanations, generate task-relevant feedback, and model academic discourse. These features are particularly useful for learners who need support with structuring their ideas, paraphrasing complex concepts, or overcoming writer's block. According to the review, the tool is also praised for helping students plan essays, revise drafts, and complete assignments more efficiently. Furthermore, its conversational nature encourages learners to interact with content more actively than traditional passive study methods.

Heung and Chiu (2025) reinforced these findings by showing that ChatGPT contributes positively to all three dimensions of student engagement including behavioral, emotional, and cognitive. The authors emphasized that students using ChatGPT were more likely to persist with challenging tasks, report enjoyment while studying, and engage in reflective thinking. These benefits were most pronounced when ChatGPT was used alongside teacher guidance or embedded in assignment prompts, highlighting the importance of pedagogical framing. Shahzad, Xu, and Javed (2024) also found that the tool's perceived usefulness and intelligence were key factors in promoting learner acceptance. When students trusted the tool and found it easy to use, they were more likely to integrate it into their learning routines. These findings collectively demonstrate that ChatGPT has substantial potential as a pedagogical support tool, especially in contexts where immediate human feedback is limited.

2.4. Challenges and Ethical Concerns in Secondary Settings

Despite the benefits associated with ChatGPT, several challenges and ethical concerns limit its effectiveness in secondary education, particularly in contexts with limited technological

infrastructure or insufficient digital literacy. One of the most frequently cited issues is the risk of overreliance. According to Deng et al. (2025), many students develop a tendency to defer to AI responses without engaging in critical evaluation or independent problem-solving, which may hinder the development of key academic skills over time. This is especially concerning in secondary education, where foundational learning habits are being formed. Wang and Fan (2025) also acknowledged that while generative AI can support higher-order thinking, this outcome is contingent on appropriate use. When used passively or without clear instructional framing, ChatGPT may inadvertently encourage shallow processing and rote learning. The same study highlighted that unguided or excessive use may reduce students' ability to self-regulate their learning. Another major concern is content accuracy. ChatGPT can generate plausible but factually incorrect or misleading information, especially in complex subjects such as science or history. Heung and Chiu (2025) observed that students without sufficient domain knowledge often fail to detect such inaccuracies, increasing the likelihood of conceptual misunderstanding.

Ethical concerns are also prominent. Students may use ChatGPT to complete assignments without properly engaging with the learning material, raising issues related to academic honesty and plagiarism. Shahzad et al. (2024) found that many students were unclear about the ethical boundaries of using AI tools in their coursework. The authors emphasized the need for institutional policies and clear guidelines to help students distinguish between legitimate academic support and academic misconduct. Lastly, digital equity remains a significant issue. As noted by Deng et al. (2025), disparities in access to devices, connectivity, and AI literacy may exacerbate existing inequalities, particularly in public secondary schools located in rural or under-resourced regions. This raises concerns about fairness and inclusivity in the integration of AI tools into mainstream education.

3. Methods

This study adopted a qualitative exploratory research design to investigate Moroccan secondary school students' perceptions of ChatGPT. A qualitative approach was chosen to allow for in-depth exploration of learners' subjective experiences, beliefs, and concerns regarding the use of generative AI in their educational practices. The exploratory nature of the study is justified by the limited empirical literature focused on secondary-level learners in Morocco, especially in relation to ChatGPT use.

3.1. Participants and Sampling

The study involved 18 secondary school students (aged 15–18) from three different public high schools in Sidi Bennour, a city located in the Casablanca-Settat region of Morocco. Participants were selected using purposive sampling, with the primary criterion being prior exposure to ChatGPT through personal, academic, or extracurricular use. During initial contact, students were asked whether they had experience using ChatGPT, and those who confirmed prior use were invited to participate in the study. The sample included both male and female students across different grade levels (1st, 2nd, and 3rd year of secondary education). Diversity in school background, gender, and digital familiarity was considered to ensure variation in perspectives. A total of 18 participants were included, a number aligned with qualitative research recommendations for achieving thematic saturation in interview-based studies. According to Guest, Bunce, and Johnson (2006), data saturation is often reached with as few as 12 participants in relatively homogeneous groups. Braun and Clarke (2013) also suggest that samples between 12 and 20 are appropriate for thematic analysis, particularly when the aim is to explore patterned meaning across a specific population. Given the focused context and research objectives of this study, 18 participants allowed for sufficient depth, diversity, and saturation of themes.

3.2. Data Collection Tools

Data were collected through semi-structured interviews, which allowed for a balance between guiding questions and the flexibility to explore unanticipated themes. The interview guide included open-ended questions focusing on students' perceived benefits of ChatGPT, its influence on their learning behavior and motivation, and any challenges or ethical concerns they had encountered. Probing questions were used to encourage elaboration and clarification.

3.3. Data Collection Procedures

Interviews were conducted in Moroccan Arabic (Darija) to ensure that students fully understood the questions and felt comfortable expressing their thoughts in depth. Each interview lasted between 25 to 40 minutes and was conducted in a quiet space within the school premises during non-instructional hours. All interviews were audio-recorded with participants' consent. Transcripts were prepared verbatim and later translated into English for analysis to preserve the authenticity of students' responses. To ensure transparency, students were informed that their participation was voluntary, their responses confidential, and that they could withdraw at any

point. The researcher is a Moroccan educator and doctoral researcher with professional experience in secondary education. This positionality provided contextual familiarity with the educational setting, while reflexive journaling and member checking were employed to minimize potential bias in interpreting students' perspectives.

3.4. Data Analysis Method

A thematic analysis approach was employed to analyze the data, following Braun and Clarke's (2006) six-step framework: familiarization with data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. NVivo 12 software was used to assist in coding and organizing data. Codes were derived inductively from the data rather than imposed beforehand, allowing themes to emerge naturally based on students' own language and experiences. To enhance data credibility, member checking was conducted with five participants who were asked to review summaries of their interviews to verify the accuracy of interpretation. Additionally, two independent researchers reviewed a subset of transcripts and coding schemes to ensure inter-coder reliability, and discrepancies were resolved through discussion. A reflective journal was kept by the researcher to monitor biases during analysis.

4. Results

This section presents the thematic findings from the analysis of interview data collected from 18 Moroccan secondary school students in Sidi Bennour. Using Braun and Clarke's (2006) thematic analysis framework, three overarching research questions guided the data interpretation. Each research question is addressed in a dedicated subsection, with emergent themes presented and illustrated through selected student quotes translated from Moroccan Arabic. The themes were identified inductively but are conceptually supported by prior literature, ensuring coherence with existing knowledge while capturing student-specific experiences with ChatGPT. The themes are reported separately by research question to maintain alignment with the study's objectives.

4.1. Perceived Benefits of Using ChatGPT as a Learning Tool

Students reported a range of perceived benefits when engaging with ChatGPT as part of their informal learning routines. Three major themes emerged from the data: (1) Instant and Clear Explanations, (2) Personalized Learning and Autonomy, and (3) Support for Language and Writing Tasks.

Theme 1: Instant and Clear Explanations

Many students emphasized that ChatGPT provided immediate answers that were simpler and clearer than classroom materials or textbooks. The availability of round-the-clock explanations was perceived as especially helpful when revising independently or when struggling with difficult subjects.

"When the teacher is not around, ChatGPT helps me understand lessons in science and history. It explains things in a way that's easier for me." — Student 7, 3rd-year secondary

"I don't need to wait for my teacher or tutor. I just ask and get a quick explanation. Sometimes it gives examples too, which I like." — Student 3, 2nd-year secondary

This perceived benefit aligns with the idea of just-in-time learning, where learners receive support exactly when needed, promoting immediate comprehension and reducing frustration during independent study.

Theme 2: Personalized Learning and Autonomy

Several students described ChatGPT as a tool that allowed them to learn at their own pace and revisit concepts without embarrassment or pressure from peers. The ability to ask any kind of question without judgment was repeatedly mentioned.

"In class I'm shy to ask the same question twice. But with ChatGPT, I can ask until I understand. No one makes fun of me." — Student 11, 1st-year secondary

"It helps me study by myself. I don't always need someone to teach me when I have ChatGPT." — Student 14, 3rd-year secondary

This theme highlights how ChatGPT fostered a sense of learner autonomy, which students associated with increased confidence and control over their learning.

Theme 3: Support for Language and Writing Tasks

A notable number of students mentioned using ChatGPT to help with English or French writing assignments. They reported that the tool helped with grammar correction, vocabulary suggestions, and even idea generation when they had writer's block.

"Sometimes I ask ChatGPT to check my English paragraph and it tells me what is wrong. It helps with grammar and new words." — Student 4, 2nd-year secondary

"It gives me ideas when I don't know what to write in essays. I use it to start writing and then I finish by myself." — Student 15, 3rd-year secondary

Students viewed this use as a supportive scaffold, especially when they lacked confidence in writing independently, particularly in a foreign language context.

4.2. Students' Perceived Impacts of ChatGPT

Students reflected not only on the benefits of using ChatGPT but also on how the tool was shaping their broader learning behaviors, motivation, and academic performance. Three key themes emerged from their responses: (1) Increased Learning Motivation, (2) Changes in Study Habits and Time Management, and **(**3) Overreliance and Passive Learning Tendencies.

Theme 1: Increased Learning Motivation

Several students shared that the availability and responsiveness of ChatGPT made learning feel more engaging. The tool's conversational style and encouragement boosted their willingness to revise topics or practice questions even outside school hours.

"Before, I didn't enjoy studying at home. But now, when I use ChatGPT, I feel like someone is helping me, so I want to study more." — Student 6, 2nd-year secondary

"It's like having a tutor. I ask and it answers quickly. That makes me want to continue learning." — Student 17, 3rd-year secondary

This sense of motivation appeared to stem from the immediacy and interactivity of the tool, which made learning feel less like a chore and more like a dialogue.

Theme 2: Changes in Study Habits and Time Management

Many students described shifting how they organized their study routines. ChatGPT was often used as a pre-study or revision aid, helping students summarize topics or test their understanding through self-generated questions.

"I use ChatGPT before tests to make a summary of the lesson. It helps me revise faster." — Student 2, 1st-year secondary

"Now I plan my study differently. I study alone first with ChatGPT, then I check my notebook. It saves me time." — Student 13, 3rd-year secondary

This theme suggests a movement toward self-regulated learning, where students strategically use AI to optimize how and when they study.

Theme 3: Overreliance and Passive Learning Tendencies

While many students reported positive changes, a few expressed concern or observed among their peers that ChatGPT was making some students overly dependent on the tool, particularly for answering questions or doing homework.

"Sometimes I don't try to think. I just copy what ChatGPT says. I know that's not good, but it's fast." — Student 9, 2nd-year secondary

"My friend uses it for everything, even small homework. He doesn't even try first." — Student 10, 3rd-year secondary

These responses point to passive learning risks such as reduced critical thinking or lack of effort especially when ChatGPT is used as a shortcut rather than a learning aid. Students recognized this impact and sometimes expressed guilt or concern about becoming too reliant on the tool.

4.3. Students' Perceived Challenges and Concerns Regarding ChatGPT Use

While students recognized the advantages of ChatGPT, they also reported a range of challenges and concerns associated with its use. Three dominant themes emerged: (1) Concerns about Accuracy and Trustworthiness, (2) Fear of Overdependence and Mental Laziness, and (3) Digital Access Inequality.

Theme 1: Concerns about Accuracy and Trustworthiness

Several students were aware that ChatGPT sometimes produced information that was incorrect or misleading, especially in subjects that required precise answers such as mathematics, physics, or history.

"Sometimes it gives wrong answers in math or mixes facts in history. I have to double-check with my book or teacher." — Student 8, 2nd-year secondary

"I asked it something in physics, and later my teacher said the answer was not correct. So I don't always trust it 100%." — Student 12, 3rd-year secondary

This theme reflects a growing awareness among students that AI-generated content must be approached with caution. Even though ChatGPT is used widely, some students were developing a critical stance toward its output, particularly in subjects where factual precision matters.

Theme 2: Fear of Overdependence and Mental Laziness

A number of students expressed worry either about themselves or others that using ChatGPT too often might reduce their own cognitive effort or ability to think independently.

"When I use it too much, I feel like my brain stops working. I just read and copy." — Student 5, 3rd-year secondary

"It makes people lazy. They don't try to think or solve problems by themselves anymore." — Student 1, 2nd-year secondary

This fear of mental laziness or reduced effort was often linked to academic tasks such as writing, problem-solving, or reflection, and some students reported intentionally limiting their use of ChatGPT to avoid such effects.

Theme 3: Digital Access Inequality

Although all participants in this study had at least some access to ChatGPT, many pointed out that not all of their classmates were able to use it due to limitations like poor internet connection, lack of a smartphone, or unfamiliarity with how to interact with AI tools.

"Some of my classmates don't have internet at home, so they cannot use it like I do." — Student 16, 1st-year secondary

"If you don't have good Wi-Fi or a phone, you can't use ChatGPT. That's unfair." — Student 18, 3rd-year secondary

This theme highlights inequitable access to digital resources, which students saw as a significant barrier that could create a new form of academic divide between those who can benefit from AI tools and those who cannot.

The qualitative findings revealed a nuanced picture of how Moroccan secondary school students perceive and engage with ChatGPT. While many students highlighted the tool's usefulness in providing instant explanations, promoting autonomous learning, and supporting writing tasks, they also reflected on deeper impacts on their study habits, motivation, and time management. At the same time, students voiced thoughtful concerns about accuracy, potential overreliance, and unequal access. These insights underscore that student interaction with ChatGPT is not uniformly positive or negative, but shaped by personal experience, technological literacy, and educational context. The following section discusses these findings

in relation to existing research and explores their implications for policy, practice, and future inquiry.

To provide a concise overview of the key findings, Table 1 summarizes the three overarching themes and their associated sub-themes, along with representative student quotes that illustrate each dimension of learners' perceptions.

Table 1. *Overview of Themes and Sub-Themes Emerging from Student Perceptions*

Overarching Theme	Sub-Themes	Illustrative Quote
Perceived Benefits	Instant and Clear Explanations	"When the teacher is not around, ChatGPT helps me understand lessons in science and history." (Student 7)
	Personalized Learning and Autonomy	"In class I'm shy to ask the same question twice. But with ChatGPT, I can ask until I understand." (Student 11)
	Support for Language and Writing Tasks	"Sometimes I ask ChatGPT to check my English paragraph and it tells me what is wrong." (Student 4)
Perceived Impacts	Increased Learning Motivation	"Before, I didn't enjoy studying at home. But now, when I use ChatGPT, I feel like someone is helping me." (Student 6)
	Changes in Study Habits and Time Management	"I use ChatGPT before tests to make a summary of the lesson. It helps me revise faster." (Student 2)
	Overreliance and Passive Learning Tendencies	"Sometimes I don't try to think. I just copy what ChatGPT says." (Student 9)
Perceived Challenges	Concerns about Accuracy and Trustworthiness	"Sometimes it gives wrong answers in math or mixes facts in history." (Student 8)
	Fear of Overdependence and Mental Laziness	"When I use it too much, I feel like my brain stops working." (Student 5)
	Digital Access Inequality	"Some of my classmates don't have internet at home, so they cannot use it like I do." (Student 16)

5. Discussion

This study explored Moroccan secondary school students' perceptions of ChatGPT, focusing on its perceived benefits, impacts, and challenges in their learning experiences. The findings reveal a nuanced understanding of how generative AI is being integrated into students' informal learning routines in Sidi Bennour. Thematic analysis of the interview data showed that while students value ChatGPT for providing instant explanations, promoting autonomous learning,

and supporting writing tasks, they are also aware of its potential drawbacks, including accuracy issues, overreliance, and unequal access. These results align with the growing body of research showing that students' experiences with AI tools are shaped by their digital literacy, learning preferences, and the broader educational context (Kasneci et al., 2023; Zhao et al., 2024).

5.1. Perceived Benefits of Using ChatGPT

The first research question examined the benefits students associate with ChatGPT. Across interviews, three main themes emerged: instant and clear explanations, personalized learning and autonomy, and support for language and writing tasks. The finding that ChatGPT delivers timely, simplified explanations resonates with global studies highlighting AI's capacity for "just-in-time" learning, which supports immediate comprehension and problem-solving (Alharbi, 2024). Students in this study described using ChatGPT to bridge gaps in understanding outside school hours, a practice similar to what Okunade (2024) found in Nigerian secondary schools, where AI tools were used as on-demand tutors to reinforce difficult subjects. Personalized learning and autonomy were also central to participants' experiences. Students valued the ability to control the pace of learning and revisit topics without social pressure. This aligns with Zimmerman's (2002) self-regulated learning theory, where control over one's learning process is linked to higher engagement and achievement. The role of ChatGPT in language and writing support adds to existing findings that AI can enhance L2 writing by providing grammar feedback, vocabulary suggestions, and idea generation (Kohnke et al., 2023; Yang, 2024). In the Moroccan context, where multilingual demands are high, this function is particularly relevant, supporting the argument of Moukhliss (2024) that generative AI could help bridge linguistic barriers and support writing across multiple languages. The emphasis on a judgment-free learning environment may reflect Morocco's traditionally teacher-centered classrooms, where asking repeated questions can be culturally constrained. In this sense, the anonymity of AI interactions provided students with a safe learning space, which aligns with studies showing that chatbots foster personalized learning and student confidence while simultaneously raising awareness of potential dependency (Labadze et al., 2023; Giannakos et al., 2024; Ismaili, 2024)

5.2. Perceived Impacts on Learning Behaviors and Motivation

The second research question explored how ChatGPT influences students' study habits, motivation, and learning approaches. Three themes emerged: increased learning motivation,

changes in study habits and time management, and overreliance leading to passive learning tendencies. Students reported feeling more motivated when using ChatGPT due to its responsiveness and conversational tone, which aligns with findings from Deng et al. (2025) and Heung et al. (2025) showing that interactive AI systems can foster emotional engagement and sustained interest in learning. The perception of ChatGPT as a "personal tutor" reflects similar findings by Lai (2024), who observed increased out-of-class engagement among secondary students using AI tools for revision. Changes in study habits were also evident, with students using ChatGPT strategically for summarizing lessons and checking understanding before tests. This mirrors findings from Kasneci et al. (2023), who noted that AI-assisted summarization can help students manage cognitive load and improve revision efficiency. In Morocco, such shifts could complement national educational reform goals that emphasize learner-centered approaches and digital integration (El Khayati, 2025). However, the theme of overreliance reflects a growing concern in the literature. As Forero and Herrera-Suárez (2024) caution, dependence on AI-generated responses may discourage independent problem-solving and reduce critical thinking. Similar risks were reported by Mekheimer (2025), who found that high-frequency AI use in writing tasks sometimes led students to bypass the drafting and revision process altogether. Some students in this study reported intentionally setting personal boundaries for their ChatGPT use, such as double-checking its output against textbooks or limiting its role to revision. These behaviors resonate with the growing emphasis on AI literacy in Moroccan contexts, where students are encouraged to critically evaluate AI responses and use them as a complement rather than a replacement for human reasoning (Ismaili, 2024).

5.3. Perceived Challenges and Concerns

The third research question addressed challenges students experience with ChatGPT, with themes including accuracy concerns, fear of overdependence, and digital access inequality. Students' skepticism toward ChatGPT's accuracy aligns with broader literature warning that large language models can generate factually incorrect content despite appearing confident (Bang et al., 2023). Such awareness is promising, as it suggests the beginnings of critical AI literacy among adolescents. Nevertheless, inaccuracies in subjects like physics and history could mislead students without proper verification, reinforcing the need for AI literacy training as recommended by Chan and Hu (2024). The fear of overdependence echoes the "cognitive offloading" phenomenon described by Risko and Gilbert (2016), wherein learners rely on external tools for memory and problem-solving, potentially reducing internal cognitive

engagement. In Moroccan classrooms, this concern may be compounded by existing challenges in promoting critical thinking skills, as noted by Benali and Zourgi (2024). The concerns voiced by students mirror broader reviews of AI in education, which underline both the promise and the limitations of generative AI: while it can provide immediate support, its factual unreliability and potential to encourage shallow processing require structured guidance and literacy training (Giannakos et al., 2024; Labadze et al., 2023). Finally, digital access inequality emerged as a notable challenge, with students recognizing that peers without reliable internet or devices are excluded from ChatGPT's benefits. In Morocco's secondary sector, where infrastructure is unevenly distributed between urban and rural schools, this issue warrants targeted policy intervention.

An important distinction that emerges from the findings concerns which perceptions are context-specific to Moroccan secondary education and which appear more universal across student populations. For instance, the strong emphasis students placed on ChatGPT's support for multilingual writing reflects the unique linguistic landscape of Morocco, where secondary learners navigate Arabic, French, and increasingly English. This benefit may not be as salient in more monolingual contexts, but it is crucial for understanding the pedagogical potential of AI in Morocco's multilingual classrooms (Benali & Zourgi, 2024). Similarly, references to limited internet connectivity and unequal access to digital tools highlight structural challenges specific to Moroccan secondary schools, especially in under-resourced regions (El Khayati et al., 2025). By contrast, concerns about accuracy, overreliance, and the fear of diminished critical thinking echo findings reported globally in AI-in-education research (Kasneci et al., 2023; Zhao et al., 2024). These issues appear to represent transferable risks that secondary students in diverse contexts may share, regardless of local infrastructure or cultural norms. Making this distinction between the local and the global enhances the applicability of the study: it both contributes to global debates on generative AI while foregrounding the lived realities of Moroccan learners.

Taken together, the findings indicate that Moroccan secondary students' perceptions of ChatGPT are shaped by a balance of opportunity and caution. On one hand, ChatGPT appears to enhance motivation, promote learner autonomy, and provide valuable academic support, particularly in multilingual writing contexts. On the other, concerns about accuracy, overreliance, and unequal access highlight the importance of integrating AI tools alongside explicit training in critical evaluation and responsible use. This mirrors the consensus in recent

scholarship that successful AI adoption in education depends on a combination of technological access, teacher mediation, and student AI literacy (Kasneci et al., 2023). In this way, the Moroccan secondary context offers a microcosm of the global conversation on how AI can be leveraged to empower learners while safeguarding against unintended consequences.

6. Conclusion

This study set out to investigate Moroccan secondary school students' perceptions of ChatGPT use ChatGPT use across multiple subjects, focusing on its perceived benefits, impacts, and challenges. The findings reveal that students generally value the tool for enhancing comprehension, vocabulary acquisition, and engagement, while at the same time pointing to difficulties such as occasional inaccuracies, overreliance risks, and curriculum misalignment. By centering student voices, the study contributes a perspective often overlooked in the growing body of AI-in-education research, particularly within Global South contexts such as Morocco. In doing so, it highlights not only the pedagogical opportunities of ChatGPT integration but also the structural and instructional constraints that condition its effective use.

6.1. Pedagogical Implications

6.1.1. *For Classroom Teachers*

The findings underscore the need for professional development in prompt engineering, critical evaluation of AI outputs, and strategies for scaffolding AI-assisted learning so that students remain active rather than passive users of technology. Teachers can design classroom activities where learners use ChatGPT but then critically evaluate its output, turning autonomy into a site for guided reflection and responsible digital literacy (Labadze et al., 2023; Ismaili, 2024).

6.1.2. *For Students*

ChatGPT can serve as a supportive resource, but only when learners are guided by a clear awareness of its limitations. This highlights the importance of fostering critical digital literacy skills alongside language and subject-specific knowledge. By encouraging students to reflect on when and how to use ChatGPT responsibly, educators can help learners build independence without overreliance.

6.1.3. *For School Leaders and Policymakers*

The study highlights the urgency of providing reliable infrastructure, clear guidelines for ethical use, and curriculum frameworks that allow technology to complement rather than conflict with

established teaching practices. Policymakers and administrators should focus on bridging students' informal AI practices with formal classroom instruction, creating institutional support for integrating generative AI tools into secondary education in a balanced and pedagogically informed way.

6.2. Limitations

Despite its contributions, the study is not without limitations. The research was conducted with a limited sample drawn from one Moroccan region, which restricts the generalizability of findings to other contexts. Moreover, as with many perception-based studies, reliance on self-reported data introduces subjectivity that may not fully capture actual classroom practices. While efforts were made to enhance validity and reliability through triangulation and thematic rigor, the perspectives gathered remain context-bound and shaped by the immediacy of participants' experiences. These limitations do not diminish the value of the study but rather delineate the scope within which its findings should be interpreted.

6.3. Recommendations for Future Research

Future research can build on these findings in several ways. Larger-scale mixed-methods studies across multiple Moroccan regions would offer broader insight into the role of ChatGPT in language learning and allow for quantitative validation of the trends observed here. Longitudinal designs could shed light on how students' perceptions and practices evolve over time as they become more familiar with AI tools. Comparative studies between Moroccan and other Global South or Global North contexts could also highlight cultural and systemic differences in AI integration. Finally, including teachers' and parents' perspectives alongside students would provide a more comprehensive understanding of the opportunities and risks of ChatGPT in EFL classrooms, offering a multi-voiced picture of its role in educational transformation.

Acknowledgement

Artificial Intelligence Statement: AI and AI-assisted technologies were not used

Ethics Approval Statement: This study was conducted in accordance with the principles outlined in the Belmont Report and the Declaration of Helsinki. The research involved minimal risk to participants and was limited to standard educational practices within the classroom.

Disclosure Statement

The authors declare that there is no conflict of interest regarding the publication of this article. No financial, personal, or professional relationships have influenced the research, analysis, or conclusions presented in this work.

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