Rethinking AI literacy: How high school students navigate ChatGPT in English language learning

Farah Faridatul Hasanah[*]**, Putu Dian Danayanti Degeng**

Universitas Brawijaya, Indonesia

ABSTRACT

This study explores high school students' AI literacy and their use of ChatGPT in English language learning, addressing the gap in AI application research at the secondary education level. Utilizing an explanatory sequential mixed-methods design, the study evaluated the AI literacy of 100 high school students via a validated questionnaire, assessing affective, behavioral, cognitive, and ethical dimensions. Follow-up interviews with six students of varying AI literacy levels provided deeper insights into their experiences and perceptions of ChatGPT. Findings indicate positive attitudes toward ChatGPT, with high scorers demonstrating robust engagement, adaptability, and ethical awareness in using the tool for English learning. Conversely, low scorers showed limited understanding, over-reliance on ChatGPT for superficial tasks, and underutilization of its potential for deeper learning. Despite its benefits, concerns about over-reliance and ethical issues highlight the need for structured guidance. Variations in AI literacy emphasize the importance of targeted interventions to promote critical thinking and responsible AI use. This study offers practical recommendations for integrating AI literacy into curricula to ensure effective and ethical use of AI tools. Future research should investigate the impact of comprehensive AI literacy programs on student engagement and learning outcomes.

Keywords: *AI literacy; ChatGPT; English language learning (ELL); High school students*

---

[*] ***Corresponding author*:**

Farah Faridatul Hasanah
Universitas Brawijaya
Jl. Veteran No.10-11, Ketawanggede, Kec. Lowokwaru, Kota Malang, Jawa Timur 65145, Indonesia
Email: farahfrda21@student.ub.ac.id

1. Introduction

The advent of ChatGPT as one of the generative artificial intelligences (AI) has generated considerable interest in its potential applications within the field of education, particularly in English Language Learning due to rapid advancements in natural language processing technology (Meniado, 2023; Park, 2023; Silcheva et al., 2023). High school students, as a generation of digital natives, employ ChatGPT for academic support, social communication, and personal management, expressing a favorable outlook on its potential impact (Forman et al., 2023).

Many studies reveal that ChatGPT benefits students in language learning by providing immediate feedback and enhancing various language-related skills (Akopiants, 2023a; Yang & Xu, 2024). This has prompted an investigation into its potential role in English language education. While AI can enhance students' language proficiency, it also raises concerns about excessive reliance and ethical use, particularly where students' digital literacy may not be adequately developed (Adiguzel et al., 2023; Dempere et al., 2023; Kamalov et al., 2023). Specifically, ChatGPT offers potential benefits for language teaching and learning but requires digital competencies for ethical and effective use (Kohnke et al., 2023). The efficacy of ChatGPT tools depends not only on their frequency of use by students but also on their AI literacy, defined as the knowledge and abilities requisite for understanding and critically engaging with AI technologies.

While numerous studies have explored how students perceive AI tools within educational contexts, much of the research has predominantly focused on higher education (e.g., studies by Chan & Hu, 2023; Michel-Villarreal et al., 2023; Shaengchart, 2023; Yuliani et al., 2024). Triansyah et al. (2023) in their bibliometric analysis of AI in high school contexts reveal that although the use of AI in high schools is increasing, research on its application to language learning remains limited. Emerging themes such as machine learning and deep learning are prominent, yet critical areas like AI literacy and language acquisition have not been thoroughly investigated. Moreover, limited attention has been given to understanding the AI literacy required for high school students to maximize the potential of AI tools such as ChatGPT. Despite the potential benefits of ChatGPT in aiding language learning, concerns exist that many students might use the tool without fully understanding its capabilities or limitations (Song & Song, 2023). Instead of enhancing their learning experience, some students may use ChatGPT as a shortcut, bypassing critical thinking and reflection.

In education, AI literacy involves equipping students with the skills to understand how AI systems work, critically evaluate information generated by these systems, and use them ethically. This literacy is multi-dimensional, encompassing foundational knowledge, practical application skills, ethical evaluation, and impact assessment that collectively aim to prepare individuals to interact with AI responsibly and critically analyze its outputs (Allen & Kendeou, 2024; Ng et al., 2021a; Relmasira et al., 2023). Current research on AI literacy reveals notable gaps between high school and university students due to differences in cognitive development, technical skills, and exposure to

ethical reasoning. According to Okolo (2024), high school students typically have a more superficial understanding of AI, engaging mainly with basic applications like chatbots. In contrast, university students delve into more advanced concepts, such as algorithms and machine learning, facilitated by their more developed cognitive abilities and exposure to complex material. Ethical reasoning is another area where gaps emerge; Lérias et al. (2024) observed that university students often examine AI's societal implications within interdisciplinary studies, while high schoolers focus primarily on functionality.

Addressing these gaps is especially important in fields like English language learning (ELL), where AI tools such as ChatGPT are increasingly prevalent and can enhance learning experiences for high school students if used responsibly and thoughtfully (Crompton et al., 2024). As AI technologies like ChatGPT become more integrated into language learning, students need specific competencies—including technical, critical, and ethical skills—to use these tools effectively and responsibly. This study aims to evaluate high school students' AI literacy across these competencies within the context of English Language Learning (ELL). Specifically, this research seeks to answer two key questions: (1). To what extent do high school students exhibit AI literacy across affective, behavioral, cognitive, and ethical dimensions when using ChatGPT for English language learning? (2). How do high and low levels of AI literacy students differ in their experiences and perceptions of ChatGPT?

By exploring these questions, this research aims to determine if students are adequately prepared and digitally literate to be AI users, regarding ChatGPT in their academics, especially English language learning. Ultimately, the goal is to provide insights for integrating AI tools effectively and responsibly into educational practices, with a focus on enhancing language education.

2. Literature review

2.1. Artificial intelligence (AI) literacy

In the evolving landscape of digital education, according to Carolus et al. (2023), the term "literacy" has evolved from simply referring to the basic ability to read and write to encompass a broader set of skills. With the rapid advancement of artificial intelligence (AI) technologies, the definition of digital literacy has expanded to include AI literacy, emphasizing the importance of AI literacy including the skills and dispositions needed to engage with AI tools critically, effectively, and ethically.

Initially, AI literacy was often defined as the ability to operate AI-driven tools like chatbots, data analytics software, and machine learning systems (Faruqe et al., 2021; Long & Magerko, 2020). However, scholars have increasingly called for an expanded definition that incorporates higher-order thinking skills such as creation, collaboration, and evaluation (Ng et al., 2021b). They also emphasize that AI literacy must encompass attitudes, moral decision-making, and ethical considerations, such as bias, data privacy, and accountability. This expanded view ensures that AI literacy education fosters responsible and reflective users who can navigate the socio-technical complexities of

intelligent systems (Knoth et al., 2024). These competencies extend beyond cognitive knowledge about AI systems' functions; they also include practical skills for using AI tools and understanding ethical considerations involved in their application. As a result, research into AI literacy has become essential to ensure that learners can navigate this rapidly changing digital landscape responsibly and effectively.

Among the most widely adopted frameworks is the ABCE model developed by Ng et al. (2023) which categorizes AI literacy into four interrelated dimensions: Affective, Behavioral, Cognitive, and Ethical. This model is an adaptation of the ABC framework originally proposed by van Harreveld et al. (2015), which conceptualizes attitudes as a combination of affective, behavioral, and cognitive components. Ng et al. expanded this framework by adding an ethical dimension to address the growing need for responsible engagement with AI. The inclusion of ethics acknowledges that beyond skills and attitudes, students must also consider the societal and moral implications of AI use. This theoretical adaptation provides a comprehensive foundation for evaluating AI literacy across emotional, practical, intellectual, and ethics.
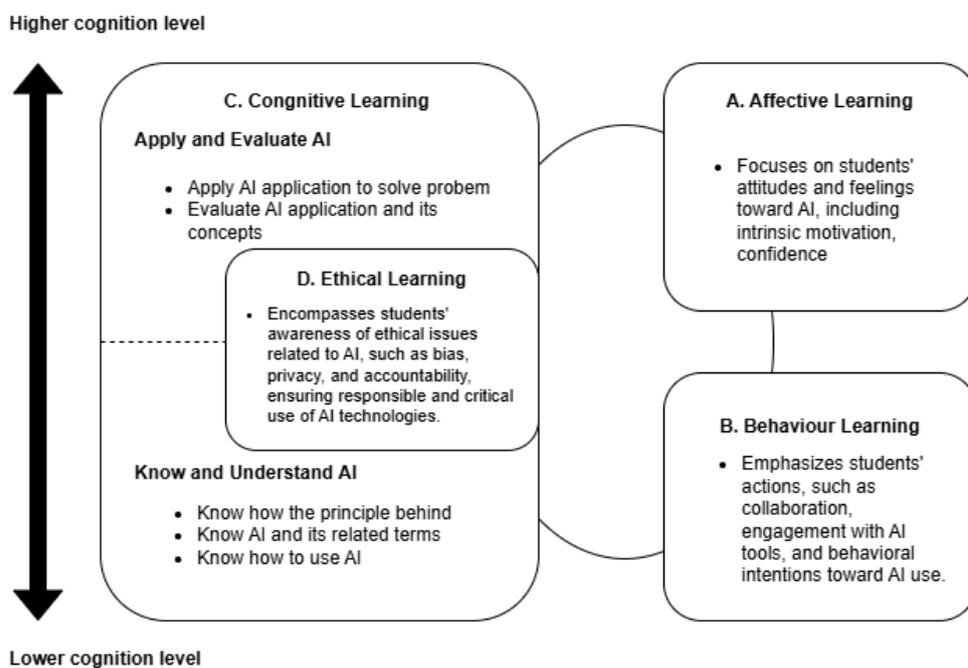
Figure 1. Dimensions of AI literacy: Affective, behavioral, cognitive, and ethical (ABCE) framework (Adapted from Ng et al., 2023)

This framework bridges earlier definitions of digital, media, and information literacy and is particularly suited to educational settings. It also aligns well with psychological constructs such as self-efficacy, behavioural intention, and moral development. Therefore, the ABCE model provides a robust theoretical foundation for understanding and assessing AI literacy in educational contexts. The framework not only

emphasizes functional interactions with AI but also delves into understanding its underlying mechanisms, ethical implications, and societal impacts. These dimensions collectively aim to prepare students as informed digital citizens capable of navigating the complexities of AI in their personal and professional lives.

2.2. ChatGPT in English language learning

2.2.1. Benefits of ChatGPT in enhancing English language skills

Several studies underscore ChatGPT's effectiveness in improving various aspects of English language learning (ELL). Its most significant contributions lie in enhancing speaking, writing, grammar, and vocabulary skills. For example, Shaikh et al. (2023) report positive usability results, particularly in improving learners' skills in conversation, writing, grammar, and vocabulary. Similarly, Silcheva et al. (2023) note that ChatGPT's ability to simulate interactions with native speakers allows learners to engage in personalized and contextualized practice, helping them internalize new language structures.

The tool also supports autonomous learning. According to Xiao and Zhi (2023), the platform's immediate feedback mechanism enables learners to self-correct and develop critical evaluative skills. This process helps foster learner independence while also enhancing metalinguistic awareness. As noted by Meniado, (2023), ChatGPT provides meaning-focused input and scaffolding that aid in fluency development. Learners benefit from continuous feedback loops, which reinforce oral and written communication skills over time.

From a writing perspective, ChatGPT offers dynamic grammar correction and stylistic suggestions. Akopiants (2023) observed improved productivity and coherence in student writing due to the tool's ability to provide real-time revisions. In non-native EFL contexts, such as Japan, Schmidt et al. (2022) found ChatGPT particularly useful for grammar support, enabling learners to recognize and correct structural errors, rephrase awkward expressions, and expand vocabulary. These findings suggest that when used strategically, ChatGPT can serve as both a tutor and editor, promoting language accuracy and fluency.

2.2.2. Challenges and ethical concerns in ELL integration

Despite its strengths, the integration of ChatGPT into ELL environments faces several pedagogical and ethical challenges. One key concern is the risk of over-reliance. As Schönberger (2023) warns, excessive dependence on AI-generated content may hinder learners' development of critical thinking and problem-solving skills, as they may skip the cognitive effort required in traditional learning tasks. Furthermore, academic integrity is a pressing issue. ChatGPT's ability to generate full-length texts can lead to misuse in assignments, particularly when students use it without sufficient engagement in the learning process. This risk underscores the need for clear guidelines and AI literacy education in classroom contexts.

Access is another area of concern. Panagopoulou et al. (2023) highlight how unequal access to technology may widen existing educational disparities. Students without consistent internet or device availability may fall behind in developing AI-mediated literacy skills. Additionally, data privacy concerns must be addressed, especially in settings where students' personal data is processed through third-party platforms. Ensuring ethical use also involves preparing educators to navigate the blurred lines between assistance and over-dependence on AI.

To maximize the benefits of ChatGPT in ELL, educators must develop strategies that balance the advantages of this technology with effective pedagogical practices. By integrating ChatGPT thoughtfully into lesson plans and assessments, teachers can enhance student engagement and language proficiency while ensuring that learning remains both interactive and equitable.

2.2.3. Gaps in high school contexts

In the context of high school students, however, research on ChatGPT's role in English language learning remains limited. Szügyi et al. (2024) examined ChatGPT usage among high school and university students, reporting increased satisfaction with frequent use, yet their study lacked a direct focus on language acquisition outcomes. Similarly, Valova et al. (2024) explored general student perceptions of ChatGPT, citing both enthusiasm and over-reliance, but again, not in the context of English learning. The only study to directly investigate ChatGPT's role in high school EFL instruction is study by Sapan and Uzun (2024). Their findings showed that although students responded positively to AI-assisted tasks, traditional methods were more effective in developing core writing and vocabulary skills. This suggests that while ChatGPT holds promise, its pedagogical value at the high school level remains under-researched and potentially underdeveloped.

Given these gaps, further studies are essential to explore how AI literacy and tool familiarity affect language learning outcomes for younger learners. Future research should also examine how instructional design, teacher mediation, and curriculum alignment can optimize ChatGPT's use in secondary ELL classrooms.

3. Method

3.1. Research design and procedures

This study employs an explanatory sequential mixed-methods design, integrating quantitative and qualitative research methodologies to address the research objectives comprehensively (Creswell, 2014). The quantitative phase precedes the qualitative phase, with initial numerical data guiding the selection of participants and themes for the subsequent qualitative exploration. As elucidated in Figure 2, following the development and validation of the AI Literacy Questionnaire, the instrument was administered to a sample of 100 high school students. The survey was administered online to ensure accessibility, and participants were allotted one week to complete it.

Following the analysis of quantitative data using descriptive statistics to identify trends and patterns, six students were selected for the qualitative phase based on their AI literacy scores: three with the highest scores and three with the lowest. Semi-structured interviews were then conducted with these students to gain deeper insights into their practical experiences, challenges, and attitudes regarding ChatGPT usage for English language learning. Interviews were conducted in person. This approach ensures a robust understanding of both general trends and individual experiences related to AI literacy and ChatGPT usage.
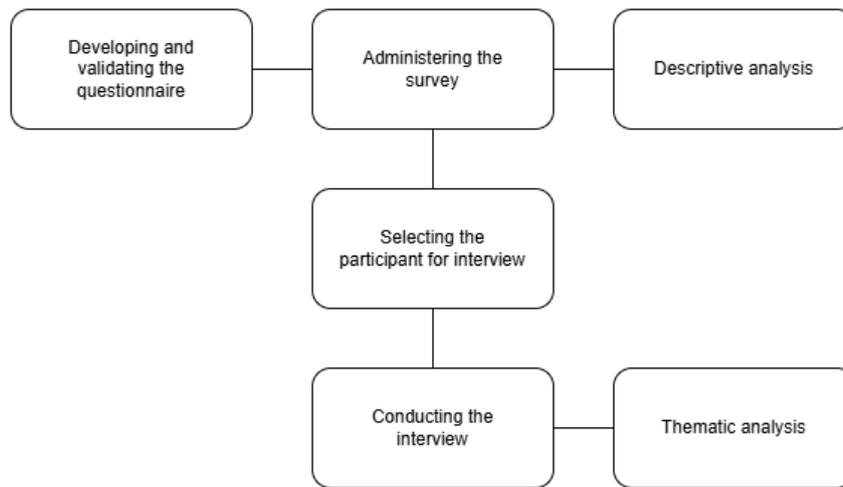
Figure 2. Research procedure

3.2. Participant

The study involved 100 12th-grade students from a public high school in Malang, Indonesia, chosen for its diverse student population, ensuring similar levels of educational maturity, ChatGPT familiarity, and English language learning experience. The quantitative phase included all 100 students who completed the AI Literacy Questionnaire. From this, six students were purposefully selected for the qualitative phase: three with the highest AI literacy score and three with the lowest, providing contrasting perspectives. Ethical considerations were prioritized, with informed consent obtained from students and their guardians.

3.3. Instrument

The primary instrument was an AI Literacy Questionnaire adapted from Kit Ng et al. (2023) and Ng et al. (2023), measuring AI literacy specifically focusing on the usage of ChatGPT for ELL across four key dimensions: affective learning, behavioral learning, cognitive learning, and ethical learning. A 5-point Likert scale was used, ranging from "Strongly Disagree" to "Strongly Agree." Semi-structured interviews were conducted with participants with the highest and lowest AI literacy scores, focusing on their practical

experiences, ethical considerations, and attitudes toward ChatGPT in learning. The AI Literacy Questionnaire's validity and reliability were tested with 30 participants. The Pearson Product Moment correlation method confirmed all items were valid, with correlation values exceeding the critical value of 0.361. The Cronbach's Alpha method indicated strong internal consistency with a value of 0.908, above the accepted threshold of 0.6, ensuring the questionnaire's reliability.

3.4. Data analysis

The data analysis followed a sequential process consistent with the research design. The quantitative data from the AI Literacy Questionnaire were analyzed using descriptive statistics, including means and standard deviations, to summarize the students' AI literacy levels and ChatGPT usage patterns. These findings provided a foundation for selecting participants for the qualitative phase and guided the development of interview questions (Creswell, 2014). The qualitative data were analyzed thematically following the steps outlined by Naeem et al. (2023). This thematic analysis uncovered recurring themes and deeper insights into the students' experiences, challenges, and perceptions, enriching the understanding of the quantitative results. By integrating the findings from both phases, the study provided a comprehensive view of high school students' AI literacy and their engagement with ChatGPT as a tool for English language learning.

4. Findings

4.1. Student's level of AI literacy

Findings are presented based on the four dimensions of ABCE theory of AI Literacy. The result can be seen in table 1.

Table 1

The questionnaire result of student affective learning in AI literacy.

No	Statement	Mean	SD
Affective Learning			
1	Learning English using ChatGPT is relevant to my studies.	3.48	0,904
2	Learning English Using ChatGPT is interesting.	3,45	0,989
3	I am curious about discovering new ways to use ChatGPT for learning English.	3,91	0,933
4	I am confident I can use ChatGPT effectively for English learning.	3,56	0,978
5	I believe I can master English language skills using ChatGPT.	3,12	0,998
6	I am sure I can understand how ChatGPT assists me in learning English.	3,56	0,935
7	I am confident I can understand English with the basic concepts of using ChatGPT.	3,29	0,998
8	I am confident I can choose the right prompts to use with ChatGPT for English tasks.	3,44	0,935
Behavioral Learning			
1	I plan to explore new ways to use ChatGPT for learning English.	3,64	0,938
2	I plan to learn about new features of ChatGPT to improve my	3,62	0,930

	English.		
3	I actively use ChatGPT to help me learn English.	3,23	0,983
4	I learn effectively by using ChatGPT for English language tasks.	3,20	1,082
Cognitive Learning			
1	I know what AI such as ChatGPT is and recall the definitions.	3,64	1,097
2	I know how to use ChatGPT features for English Learning (e.g., grammar correction, writing assistance).	3,64	0,916
3	I understand the basic principles behind how ChatGPT works.	3,51	0,969
4	I can evaluate how effective ChatGPT is in helping me learn English.	3,68	0,886
Ethical Learning			
1	I think that AI ethics is important to guide moral conduct to develop and use AI technology.	3,91	1,102
2	I believe that it is important to use AI tools like ChatGPT responsibly to ensure that it helps me without causing harm	4,07	1,075
3	I think the misuse of using AI tools like ChatGPT (e.g., for cheating) could harm my education.	4,24	1,026
4	I believe that AI tools like ChatGPT should respect my privacy and not share personal information.	4,22	1,133
5	I think that students should understand how ChatGPT works, what it can do for learning English, and what limitations it might have.	4,06	1,135
6	I think the school should regulate the use of ChatGPT following the ethical guidelines to ensure that it helps students in a way that is fair and legal.	3,98	1,025
7	I think ChatGPT can help students who may struggle with English, providing them with better learning opportunities.	3,84	0,992

Students generally hold a positive attitude toward ChatGPT, seeing it as a relevant (M=3.48, SD=0.904) and engaging tool (M=3.45, SD=0.989) for learning English. Their curiosity stands out, with many eager to explore new ways to use it (M=3.91, SD=0.933), and confidence levels are moderately strong (M=3.56, SD=0.978). However, a notable exception is the comparatively low mean score (M=3.12, SD=0.998) for the statement "I believe I can master English language skills using ChatGPT." This suggests that while students are interested and optimistic about using the tool, they remain skeptical of its long-term efficacy in fully mastering English, potentially due to limited structured guidance or lack of pedagogical scaffolding in how to use it effectively.

Beyond affective responses, students actively seek to explore ChatGPT's features (M=3.62, SD=0.930) and experiment with it in their studies (M=3.64, SD=0.938). However, actual engagement in tasks remains varied (M=3.23, SD=0.983), and some students question the overall effectiveness of ChatGPT in their learning journey (M=3.20, SD=1.082). From a cognitive standpoint, students show a solid foundational understanding of AI and its functionalities (M=3.64), especially in recognizing definitions and using basic tools like grammar correction (M=3.64, SD=0.916). Yet, the relatively lower confidence in mastering skills and achieving outcomes implies that training and curriculum integration may be lacking, leaving students without a clear pathway to fully leverage the tool's potential.

Ethical awareness is particularly pronounced. Students strongly emphasize responsible AI use (M=4.07, SD=1.075), express concerns about privacy and data security (M=4.22, SD=1.133), and acknowledge the risks of misuse, such as cheating

(M=4.24, SD=1.026). There is also a shared belief that schools should establish ethical guidelines (M=3.98, SD=1.025), and many see ChatGPT as a helpful resource for students who struggle with English (M=3.84, SD=0.992). However, variations in responses suggest that not all students are equally prepared to navigate these ethical considerations. While ChatGPT sparks interest and curiosity among students, their actual engagement, confidence, and perceptions of its effectiveness differ. These findings point to the need for clearer guidance and structured support to help students make the most of ChatGPT in their English learning journey.

4.2. Student's experience in using ChatGPT in English language learning

In the second phase of this research, six students were interviewed based on their AI literacy scores from the questionnaire: three high scorers (H1, H2, H3) and three low scorers (L1, L2, L3). The goal was to explore how students with contrasting AI literacy levels engage with ChatGPT in English language learning. Following Miles and Huberman's (1994) qualitative analysis framework combined with Naeem et al. (2023), interview data were analyzed through a process of data reduction, display, and conclusion drawing. Thematic coding revealed six essential themes, which are presented in a case-ordered matrix (Table 5) and discussed below with representative quotes under thematic subheadings.

Table 2

Thematic analysis.

Theme	High scorer	Low scorer
Adaptability and Versatility	Valued ChatGPT for grammar, vocabulary, and deeper learning.	Used mainly for translation or quick task completion.
Confidence and Exploration	Build confidence through safe experimentation and curiosity.	Felt insecure and overwhelmed by ChatGPT's complex output.
Awareness of Dependency	Self-monitored AI used to avoid over-reliance.	Admitted dependency and lack of confidence to complete tasks independently.
Feature Engagement and Exploration	Used only essential features; deliberately avoided deep exploration.	Engaged with basic functions only; lacked curiosity or initiative.
Prompt Clarity and Accuracy	Understood the importance of prompt crafting for accurate responses.	Faced frustrations due to unclear prompts and vague instructions.
Call for Ethical Guidance and Creative Use	Advocated school regulations to encourage ethical, balanced AI regulation.	Desired guidance but unsure how to implement it meaningfully.

4.2.1. Adaptability and versatility

High scorers highly valued ChatGPT's adaptability and versatility, utilizing it for grammar correction, vocabulary enhancement, and additional practice. They highlighted its ability to support deeper learning beyond surface-level task completion. H1 and H3 noted, *"ChatGPT offers me more than answers; it's like a mentor helping refine my writing."* In contrast, low scorers mainly used the tool for quick task completion, such as translation or text generation, without delving into the learning opportunities it provided. An excerpt from L1 stated, *"It's faster than searching Google, so I use it because I need it quickly, not for self-study."* High scorers also expressed that ChatGPT created a safe environment for exploration, allowing them to build confidence in practicing language skills.

4.2.2. Confidence and exploration

Students appreciated how the tool stimulated curiosity, especially when discovering new vocabulary and structures. As H1 and H2 shared, *"I can experiment without feeling judged; it's a great way to test my grammar knowledge."* On the other hand, low scorers reported limited confidence, often struggling with the complexity of ChatGPT's responses. As L1 mentioned feeling less confident due to his reliance on ChatGPT, saying, *"The more I use it, the less I can learn English on my own."* L3 expressed concern about ChatGPT's high-level language, which she found unsuitable for high school students. *"The language is too high, not easy for me as a high school student."*

4.2.3. Awareness of dependency

In terms of dependency and over-reliance, high scorers were aware of the risk of becoming too dependent on ChatGPT *"Sometimes, if used too often, we become lazy to think for ourselves."* (H2), especially for simple tasks. Some deliberately avoided advanced features to reduce reliance and encourage independent learning. They prioritized learning independently, as H3 and H1 stated, *"I worry about becoming too dependent because the responses are so quick.; I make sure not to copy-paste directly from ChatGPT."* Low scorers, however, faced challenges with over-reliance, admitting they depended heavily on ChatGPT, especially for high-level language tasks they found intimidating. One excerpt illustrates this sentiment: *"Sometimes I just let ChatGPT handle the difficult parts of grammar because I can't do it myself."*

4.2.4. Feature engagement and exploration

High scorers explored essential features like grammar correction but deliberately avoided deep feature exploration to reduce dependency. H2 stated, *"I only use what I need for now."* Low scorers reported minimal exploration. L1 explained, *"I only use ChatGPT for basic tasks. I don't bother with extra features."*

4.2.5. Prompt clarity and accuracy

High scorers identified the importance of clear and concise prompts, noting how ChatGPT's accuracy improved significantly when well-crafted instructions were provided. They regarded prompt engineering as a skill worth developing. As H2 and H3 stated, *"The better my question, the better the answer. It's a learning process to phrase things correctly."* H1 also stated the same point *"If the prompt is too long or unclear, the results don't meet expectations."* Low scorers struggled with this aspect, often finding ChatGPT's responses unhelpful due to vague or unclear prompts. A user mentioned, *"I get frustrated because it doesn't understand what I want unless I spell everything out perfectly."*

4.2.6. Call for ethical guidance and creative use

High scorers emphasized the ethical use of ChatGPT, advocating for responsible usage to avoid plagiarism and viewing it as a complementary tool rather than a primary source of knowledge. They valued its role in encouraging moderation, as H2 explained, *"I use ChatGPT to check my ideas, not to write essays for me. It's about learning, not shortcuts."* They also called for clearer guidelines on AI usage, with H3 stating, *"There should be regulations to prevent dependency on AI,"* and another high scorer emphasizing, *"Students need to be more creative and wiser when using ChatGPT."* Conversely, low scorers acknowledged ethical concerns but felt uncertain due to insufficient guidance. L1 admitted, *"I know plagiarism is bad, but there aren't clear instructions on how to use AI ethically,"* while L2 noted, *"Teachers only say not to rely too much on it, but there's no clear guidance."* They recognized the need for ethical regulations but lacked confidence in implementing them, as one remarked, *"There should be rules, but I'm not sure how to follow them without guidance."*

5. Discussion

Building on the findings of this study, the discussion centres around the levels of AI literacy demonstrated by high school students in the context of using ChatGPT for English language learning. The findings reveal both promising areas where students excel and challenges that highlight the need for further support and development.

5.1. Affective learning

Students demonstrated positive attitudes toward ChatGPT, indicating its relevance and appeal as a learning tool. This aligns with existing research emphasizing the educational benefits of AI (Akopiants, 2023; Xiao & Zhi, 2023). The observed high levels of curiosity and confidence in using ChatGPT reflect students' intrinsic motivation to explore its capabilities. However, their moderate belief in ChatGPT's ability to help them master English skills suggests a need for more targeted support to build both confidence and effectiveness (Statement 5). High scorers highlighted ChatGPT's ability to provide a safe and encouraging environment for exploration, boosting their confidence

in practicing language skills and fostering curiosity, particularly when encountering new vocabulary and structures. This resonates with Ng et al. (2023), who stress the value of safe, exploratory learning environments in developing curiosity and confidence. However, for some students, these benefits were less pronounced, underscoring the importance of differentiated strategies to support diverse learner needs.

5.2. Behavioural learning

Students' active exploration of ChatGPT's features reflects their desire to enhance their learning experiences, aligning with research that emphasizes behavioral engagement as a key aspect of AI literacy (Ng et al., 2023). Statement 4 *(I learn effectively by using ChatGPT for English language tasks)* revealed that students felt the effectiveness of ChatGPT for their English learning. The high standard deviation indicates a wide variety of responses, suggesting diverse opinions and experiences among students. This diversity is echoed in the qualitative findings, where high scorers demonstrated proactive engagement, utilizing ChatGPT for tasks such as grammar correction, vocabulary expansion, and language practice. They viewed the tool as an integral part of their learning process rather than merely a means for quick answers. In contrast, low scorers often engaged with ChatGPT only superficially, relying on it for immediate solutions and missing opportunities for deeper learning. This highlights the need for structured guidance and explicit use-case examples to help all students maximize their engagement with ChatGPT and integrate it meaningfully into their study routines.

5.3. Cognitive learning

The findings reveal a strong understanding of AI concepts and ChatGPT features among many students, reinforcing the notion that AI literacy encompasses both knowledge and practical application (Relmasira et al., 2023). For instance, Statement 2 *(I know how to use ChatGPT features for English Learning, such as grammar correction and writing assistance)* indicated that no student strongly disagreed with the statement, with a minimum score of 2. However, the variability in students' familiarity and depth of understanding highlights gaps that require attention, as seen in Statement 1. High scorers exhibited advanced knowledge, demonstrating a clear understanding of AI principles and effectively applying them to their interactions with ChatGPT. In contrast, low scorers often found ChatGPT's responses complex and challenging to navigate, hindering their ability to engage effectively. Addressing these gaps through curriculum integration of AI literacy components can provide students with the foundational knowledge needed to use AI tools more confidently and competently. Reflecting on the ABCE theory used in this research, it is evident that most students are still at the lower levels of cognitive ability in AI literacy, with only a few meetings the criteria for applying and evaluating. This underscores the need for targeted educational interventions to elevate students' cognitive engagement and comprehension of AI tools.

5.4. Ethical learning

In this dimension, students showed a strong awareness of the ethical implications of using ChatGPT, including concerns about cheating, plagiarism, and data privacy. Statements 2, 3, 4, and 5 had the highest means among others, reflecting this awareness and the growing emphasis on responsible AI use in education (Kohnke et al., 2023). However, the findings in this dimension are quite unique, as they exhibit both the highest mean and highest standard deviation. This indicates that while most students agree on the importance of ethical considerations, there is significant variance in their responses. This variance is evident in the interview results. High scorers expressed a nuanced understanding of these risks, highlighting the importance of moderation and responsibility in using ChatGPT as a complementary learning tool rather than a primary knowledge source. For instance, one high scorer noted, *(I use ChatGPT to check my ideas, not to write essays for me. It's about learning, not shortcuts.)* Conversely, low scorers acknowledged ethical considerations but noted a lack of clear guidance on appropriate use. One student remarked, *(Teachers only say not to rely too much on it, but there's no clear guidance.)* This variability underscores the importance of ongoing education on ethical AI engagement. Structured discussions and clear examples are necessary to ensure consistent and responsible practices across the student population. By addressing these gaps, educators can foster a more uniform understanding of ethical AI use, promoting a culture of responsibility and critical thinking.

6. Conclusion

This study illuminates high school students' AI literacy in using ChatGPT for English language learning, revealing varied engagement across affective, behavioral, cognitive, and ethical dimensions. High scorers effectively utilized ChatGPT for deeper learning and demonstrated ethical awareness, whereas low scorers showed limited comprehension and over-reliance on the tool for superficial tasks. These disparities highlight the pressing need for targeted interventions to foster critical skills and ethical responsibility in AI use. Integrating AI literacy into curricula is essential to build students' confidence, curiosity, and responsible engagement with AI tools. Educators should implement structured guidance, practical applications, and ethical discussions to address gaps and maximize the educational potential of tools like ChatGPT. Such efforts can enhance language proficiency while cultivating critical thinking and ethical decision-making. Future research should evaluate the effectiveness of structured AI literacy programs on student engagement and learning outcomes. This study lays the groundwork for developing educational strategies and policies that prepare students for a digitally advanced, ethically conscious future.

References

Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionizing education with AI: Exploring the transformative potential of ChatGPT. *Contemporary Educational Technology, 15*(3), ep429. https://doi.org/10.30935/cedtech/13152

Akopiants, N. (2023). Using ChatGPT in the process of learning English: Advantages and opportunities. *Bulletin of the National Technical University "KhPI". Series: Actual Problems of Ukrainian Society Development, 1*, 69–72. https://doi.org/10.20998/2227-6890.2023.1.13

Allen, L. K., & Kendeou, P. (2024). ED-AI Lit: An interdisciplinary framework for AI literacy in education. *Policy Insights from the Behavioral and Brain Sciences, 11*(1), 3–10. https://doi.org/10.1177/23727322231220339

Meniado, J. C. (2023). The impact of ChatGPT on English language teaching, learning, and assessment: A rapid review of literature. *Arab World English Journal, 14*(4), 3–18. https://doi.org/10.24093/awej/vol14no4.1

Carolus, A., Koch, M. J., Straka, S., Latoschik, M. E., & Wienrich, C. (2023). MAILS – Meta AI literacy scale: Development and testing of an AI literacy questionnaire based on well-founded competency models and psychological change- and meta-competencies. Computers in Human Behavior: *Artificial Humans, 1*(2), 100014. https://doi.org/10.1016/j.chbah.2023.100014

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education, 20*(1), 43. https://doi.org/10.1186/s41239-023-00411-8

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

Crompton, H., Edmett, A., Ichaporia, N., & Burke, D. (2024). AI and English language teaching: Affordances and challenges. *British Journal of Educational Technology*, 55(6), 2503–2529. https://doi.org/10.1111/bjet.13460

Dempere, J., Modugu, K., Hesham, A., & Ramasamy, L. K. (2023). The impact of ChatGPT on higher education. *Frontiers in Education*, 8, 1206936. https://doi.org/10.3389/feduc.2023.1206936

Faruqe, F., Watkins, R., & Medsker, L. (2021). Competency model approach to AI literacy: Research-based path from initial framework to model. *Advances in Artificial Intelligence and Machine Learning, 2*(4), 580-587 https://doi.org/10.48550/arXiv.2108.05809

Forman, N., Udvaros, J., & Avornicului, M. S. (2023). ChatGPT: A new study tool shaping the future for high school students. *International Journal of Advanced Natural Sciences and Engineering Researches, 7*(4), 95–102. https://doi.org/10.59287/ijanser.562

Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023). New era of artificial intelligence in education: Towards a sustainable multifaceted revolution. *Sustainability, 15*(16), 12451. https://doi.org/10.3390/su151612451

Kit Ng, D. T., Wu, W., Lok Leung, J. K., & Wah Chu, S. K. (2023). Artificial intelligence (AI) literacy questionnaire with confirmatory factor analysis. *In 2023 IEEE*

International Conference on Advanced Learning Technologies (ICALT) (pp. 233–235). IEEE. https://doi.org/10.1109/ICALT58122.2023.00074

Knoth, N., Decker, M., Laupichler, M. C., Pinski, M., Buchholtz, N., Bata, K., & Schultz, B. (2024). Developing a holistic AI literacy assessment matrix – Bridging generic, domain-specific, and ethical competencies. *Computers and Education Open, 6*, 100177. https://doi.org/10.1016/j.caeo.2024.100177

Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). ChatGPT for language teaching and learning. *RELC Journal, 54*(2), 537–550. https://doi.org/10.1177/00336882231162868

Lérias, E., Guerra, C., & Ferreira, P. (2024). Literacy in artificial intelligence as a challenge for teaching in higher education: A case study at Portalegre Polytechnic University. *Information, 15*(4), 205. https://doi.org/10.3390/info15040205

Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. *In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1–16). ACM. https://doi.org/10.1145/3313831.3376727

Michel-Villarreal, R., Vilalta-Perdomo, E., Salinas-Navarro, D. E., Thierry-Aguilera, R., & Gerardou, F. S. (2023). Challenges and opportunities of generative AI for higher education as explained by ChatGPT. *Education Sciences, 13*(9), 856. https://doi.org/10.3390/educsci13090856

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Sage Publications.

Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International Journal of Qualitative Methods, 22*, 1-18 https://doi.org/10.1177/16094069231205789

Ng, D. T. K., Leung, J. K. L., Chu, K. W. S., & Qiao, M. S. (2021a). AI literacy: Definition, teaching, evaluation and ethical issues. *Proceedings of the Association for Information Science and Technology, 58*(1), 504–509. https://doi.org/10.1002/pra2.487

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021b). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence, 2*, 100041. https://doi.org/10.1016/j.caeai.2021.100041

Ng, D. T. K., Wu, W., Leung, J. K. L., Chiu, T. K. F., & Chu, S. K. W. (2023). Design and validation of the AI literacy questionnaire: The affective, behavioural, cognitive and ethical approach. *British Journal of Educational Technology, 55*(3), 1082–1104. https://doi.org/10.1111/bjet.13411

Okolo, C. T. (2024). Beyond AI hype: A hands-on workshop series for enhancing AI literacy in middle and high school students. *In Proceedings of the 2024 on RESPECT Annual Conference* (pp. 86–93). ACM. https://doi.org/10.1145/3653666.3656075

Panagopoulou, F., Parpoula, C., & Karpouzis, K. (2023). Legal and ethical considerations regarding the use of ChatGPT in education. *OSF Preprints*. https://doi.org/10.31235/osf.io/c5hf3

Park, H.-Y. (2023). Application of ChatGPT for an English learning platform. *STEM Journal, 24*(3), 30–48. https://doi.org/10.16875/stem.2023.24.3.30

Relmasira, S. C., Lai, Y. C., & Donaldson, J. P. (2023). Fostering AI literacy in elementary science, technology, engineering, art, and mathematics (STEAM) education in the age of generative AI. *Sustainability, 15*(18), 13595. https://doi.org/10.3390/su151813595

Sapan, M., & Uzun, L. (2024). The effect of ChatGPT-integrated English teaching on high school EFL learners' writing skills and vocabulary development. *International Journal of Education in Mathematics, Science and Technology, 12*(6), 1679–1699. https://doi.org/10.46328/ijemst.4655

Schmidt, T., Strasser, T., & Schmidt, T. (2022). Artificial intelligence in foreign language learning and teaching: A CALL for intelligent practice. *Anglistik – International Journal of English Studies, 33*(1), 165–184. https://doi.org/10.33675/ANGL/2022/1/14

Schönberger, M. (2023). ChatGPT in higher education: The good, the bad, and the university. *In 9th International Conference on Higher Education Advances (HEAd'23)* (pp. 331–338). Universitat Politècnica de València. https://doi.org/10.4995/HEAd23.2023.16174

Shaengchart, Y. (2023). A conceptual review of TAM and ChatGPT usage intentions among higher education students. *Advance Knowledge for Executives, 2*(4), 1-14. https://ssrn.com/abstract=4592118

Shaikh, S., Yayilgan, S. Y., Klimova, B., & Pikhart, M. (2023). Assessing the usability of ChatGPT for formal English language learning. *European Journal of Investigation in Health, Psychology and Education, 13*(9), 1937–1960. https://doi.org/10.3390/ejihpe13090140

Silcheva, A. G., Lamzina, A. V., Pavlova, T. L., & MISIS, T. (2023). Specifics of using text and graphical chatbots with artificial intelligence in English language teaching. *Perspectives of Science and Education, 64*(4), 621–635. https://doi.org/10.32744/pse.2023.4.38

Song, C., & Song, Y. (2023). Enhancing academic writing skills and motivation: Assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. *Frontiers in Psychology, 14*, 1260843. https://doi.org/10.3389/fpsyg.2023.1260843

Szügyi, J. S., Szügyi, E., & Takács, M. (2024). Evaluating the use of ChatGPT by university and high school students. *In 2024 IEEE 18th International Symposium on Applied Computational Intelligence and Informatics (SACI)* (pp. 497–502). IEEE. https://doi.org/10.1109/SACI60582.2024.10619721

Triansyah, F. A., Muhammad, I., Rabuandika, A., Siregar, K. D. P., Teapon, N., & Assabana, M. S. (2023). Bibliometric analysis: Artificial intelligence (AI) in high school education. *Jurnal Ilmiah Pendidikan dan Pembelajaran, 7*(1), 112–123. https://doi.org/10.23887/jipp.v7i1.59718

Valova, I., Mladenova, T., & Kanev, G. (2024). Students' perception of ChatGPT usage in education. *International Journal of Advanced Computer Science and Applications, 15*(1), 466-473. https://doi.org/10.14569/IJACSA.2024.0150143

van Harreveld, F., Nohlen, H. U., & Schneider, I. K. (2015). The ABC of ambivalence: Affective, behavioral, and cognitive consequences of attitudinal conflict. *Advances in Experimental Social Psychology, 52*, 285–324. https://doi.org/10.1016/BS.AESP.2015.01.002

Xiao, Y., & Zhi, Y. (2023). An exploratory study of EFL learners' use of ChatGPT for language learning tasks: Experience and perceptions. *Languages, 8*(3), 212. https://doi.org/10.3390/languages8030212

Yang, Y., & Xu, X. (2024). Research on artificial intelligence literacy level and its influencing factors of high school students. *International Journal of Social Science and Research*. 2024, 2(2). https://doi.org/10.58531/ijssr/2/2/1

Yuliani, S., Mukhibbah, T. L., & Agustina, E. (2024). Artificial intelligence usage in higher education: EFL students' view. *ELTR Journal, 8*(2), 119–129. https://doi.org/10.37147/eltr.v8i2.198