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# Generative Artificial Intelligence in the EFL Writing Context: Students' Literacy in Perspective

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**ABSTRACT**: The birth of generative artificial intelligence (AI) has the potential of developing language learners' English as a foreign language (EFL) writing skills; however, there is a substantial need to ensure that these learners are literate of generative AI-based tools and their potential to enhance learning writing skills. Therefore, the study aims to detect language learners' generative AI literacy in learning EFL writing skills. To achieve this purpose, the descriptive-survey method was used; (278) respondents completed a 30-closed item questionnaire and answered three questions in a semi-structured interview. The results showed that language learners' generative AI tools literacy in the EFL writing context is at a medium level. Also, the study sample's responses were not affected by their specialization, but by their GPA and mastery level of using generative AI tools in learning EFL writing skills did impact their responses. The analysis of the interviews revolved around three major themes: Challenges, affordance, and suggestions. In light of the findings, recommendations and suggestions are presented.

**Keywords:** Generative AI, Literacy, Language Learners, EFL Writing Context.

## I. INTRODUCTION

Artificial Intelligence is revolutionizing various facets of our daily lives, and education is no exception. In the age of AI-driven education, the potential advantages for both students and teachers are substantial. Nonetheless, at the core of this transformative change is the crucial requirement of digital literacy. Proficiency in navigating, understanding, and proficiently utilizing AI tools and platforms is paramount [1]. AI technology literacy involves the capacity to engage with, utilize, and critically assess AI systems [2-3]. This concept encompasses a broader understanding of AI's societal, ethical, and practical dimensions. Notably, as we transition from the descriptive AI era to the generative AI era, there is a notable surge in the development of emergent literacy skills [4]. Recently, generative AI tools have been a focal point of interest in educational spheres due to their potential to reshape literacy practices within classrooms [5]. Generative AI tools are artificial intelligence systems and algorithms designed to produce new content, such as text, images, or videos, by analyzing patterns and data from their training. These tools utilize machine learning methods, particularly deep learning, to replicate human-like behaviors in content generation. They find applications in diverse fields, including language synthesis, image creation, and creative design, often automating tasks requiring creative or human-like thinking [6]. Learners need to encompass digital literacy so that they can use these in education. According to Gilster [7], digital literacy is defined "the ability to understand and use information in multiple formats from a wide variety of sources when it is presented via computers" (p. 1). This definition underscores the significance of not just accessing information, but also comprehending and using it effectively. Digital literacy extends beyond fundamental computer skills, encompassing the capacity to assess information critically, determining its credibility and pertinence. It also entails the ability to generate content, communicate proficiently, and collaborate using digital tools and technologies. Digital literacy plays a crucial role in enhancing English language skills, particularly in the realm of academic writing [8]. It enables learners to engage in situated writing, thereby enriching their writing abilities. The proficiency in digital literacy opens avenues for learners to explore diverse content, utilize various digital tools such as blogs, wikis, and social platforms for writing, and share their works with a wider audience. This interconnected digital environment also facilitates the exchange of social support and feedback among users, ultimately influencing and improving their overall writing performance ([9]. Students have the opportunity to analyze the writing quality facilitated by technology, utilizing ChatGPT's responses as source material for classroom discussions focused on the nuances of writing. Language learners can leverage ChatGPT to enhance

their English skills across various domains, including conversation, grammar, vocabulary, pronunciation, writing, and study plans [10]. In addition, digital literacy can improve English L2 students' writing revision process [11]. Moreover, it can offer feedback to students on their language use and acting as a collaborative partner in language practice [12]. Given that generative AI results can vary based on text-based input, research is urgently needed to examine students' literacy level of generative AI tools in EFL writing context. The current study expands the literature review [8, 13, 14, 3] by identifying language learners' generative AI literacy in learning EFL writing skills. Also, it correlates responses with specialization and mastery level of generative AI tools. In addition, it looks into their views of generative AI tools literacy in learning EFL writing skills. The study attempts to answer the following research questions:

1. What are the EFL learners' generative AI tools literacy of learning writing skills?
2. Do learners' generative AI tools literacy vary based on their specialization and mastery level?
3. What are the learners' views of generative AI tools literacy in learning writing skills?

## II. THEORETICAL BACKGROUND

### *1. ARTIFICIAL INTELLIGENCE (AI) LITERACY*

Artificial intelligence (AI) literacy, initially introduced by Burgsteiner et al. [15] and Kandlhofer et al. [16], refers to the skills necessary to comprehend fundamental knowledge and concepts related to artificial intelligence. It is a collection of competencies that empower individuals to assess, communicate, and collaborate critically with AI and involves the effective utilization of AI as a tool in online, home, and workplace settings [17]. AI literacy encompasses the fundamental skills necessary for individuals to navigate, thrive, and succeed in our digital world by leveraging technologies driven by artificial intelligence [18]. AI literacy in the context of language learning is the ability to use AI technology to improve language acquisition and English language competence. Using AI-powered tools and resources for language learning, such as interactive language learning platforms, AI-driven tutors, language translation applications, and automated writing help, is part of this. The acquisition of AI literacy in English language learning entails familiarizing oneself with the uses of AI in language education, acknowledging the advantages and constraints of AI tools, and skillfully incorporating these technologies into language learning procedures. Utilize AI in a way that best promotes language acquisition and communication abilities in English entails having the ability to critically assess content created by AI, comprehend the subtleties of language processing by AI systems, and modify language learning methodologies. In the context of writing abilities, AI literacy refers to the capacity to comprehend, make use of, and engage with AI technology in order to improve one's writing competence. It entails using AI resources and tools to the process of acquiring and developing English writing skills. Grammar and spelling correction, writing recommendations, proofreading, translation, content creation, and speech-to-text are just a few of the ways AI may improve writing literacy in English [19, 20, 21, 22, 23].

Research on the impact of digital literacy on learning English as a foreign language has been tracked. In their study, Hamouma and Menezla [9] investigated the influence of digital literacy on the academic writing performance of English as a Foreign Language (EFL) students at M'sila University. The researchers employed a digital literacy questionnaire and a writing performance test, administered to the participants. The study's findings led to the conclusion that digital literacy plays a significant role in enhancing English academic writing performance among EFL students. Mudra [13] conducted an exploration of the perceptions held by young learners and English as a Foreign Language (EFL) teachers regarding the advantages and obstacles associated with digital literacy, employing in-depth semi-structured interviews. The findings illustrated that digital literacy was seen as a catalyst for enhancing young learners' English four skills. Additionally, it was noted that digital literacy facilitated familiarity with authentic materials and played a role in elevating online collaboration among both teachers and students. Nguyen and Habók [14] delved into an examination of the digital literacy levels among English as a Foreign Language (EFL) learners in Vietnamese universities. The results of the questionnaire uncovered that the majority of students have access to digital technologies both at home and within their educational institutions. Additionally, the study found that students demonstrate a satisfactory level of proficiency in digital literacy. Hwang et al. [3] investigated the development of prompt literacy skills among English as a Foreign Language (EFL) students. This skill involves the ability to generate precise prompts for AI systems, interpret the resulting outputs, and iteratively refine prompts to achieve desired outcomes. The exploration was conducted within the context of an AI-powered image creation project in which participants, through iterative drafting and refining of prompts within generative AI tools, crafted artworks symbolizing the socio-cultural meanings of English words. The study showcased the emergence of prompt literacy skills among the learners, and their engagement in the AI-powered project led to improvements in vocabulary learning strategies.

The aforementioned research illustrates how digital and AI literacy are interwoven and indicates how language acquisition may be greatly improved by AI technologies. With resources and feedback specifically designed to match the requirements of each student, these technologies provide individualized learning experiences. By providing immediate feedback on grammar, vocabulary, and sentence structure, they also help writers become more proficient. AI systems also make real resources like movies and articles accessible, which promotes a more organic learning process. Additionally, by using online platforms, these tools can improve communication between professors and students. All in all, teaching students to be AI literate gives them the tools they need to thrive in a world where AI is pervasive.

### *2. IMPACT OF AI APPLICATIONS ON LEARNING WRITING SKILLS*

The swift evolution of digital and AI technologies is fundamentally transforming the landscape of language learning through technology. Consequently, it becomes crucial for language learners to cultivate digital literacy skills. This is imperative for harnessing the benefits of digital technologies in language learning within digitally enhanced educational environments [23]. ChatGPT has the potential to serve as a language learning aid and enhance the teaching process. In a study by Athanassopoulos et al. [19], the efficacy of ChatGPT as a feedback tool was investigated within the context of German as a foreign language instruction for refugees/migrants in southern Greece. The focus was on improving writing skills, specifically in terms of vocabulary and grammar. The findings of the study revealed a notable increase in the total number of words, unique words, and the average word count per sentence in the enhanced versions of the participants' work. Gayed et al. [20] created an AI-driven web application designed to support adult English as a Foreign Language (EFL) learners in overcoming cognitive challenges associated with generating written English text. Initial findings suggest that the tool has the potential to be beneficial for EFL participants seeking more structured assistance compared to conventional word processors. In the study conducted by Tang [21], the utilization of ChatGPT in English for Academic Purposes (EAP) writing for Chinese second language students were thoroughly examined. Key discoveries highlighted its ability to offer immediate feedback on written work, support the expansion of vocabulary, generate writing concepts, and provide instant feedback on writing, ultimately boosting students' confidence. Rad et al. [22] investigated the enhancement of writing feedback literacy, engagement, and outcomes among Iranian diploma students by employing Wordtune, an AI-enhanced tool. The study revealed significant improvements in the students' writing outcomes, engagement levels, and feedback literacy as a result of utilizing Wordtune. In a study conducted by Harunasari [24], the focus was on exploring viable and responsible approaches to integrate ChatGPT into the Creative and Media Writing coursework for Indonesian undergraduates. The investigation utilized both tests and a questionnaire, revealing successful strategies that can be ethically applied in the educational setting. These encompass assessing the generated text's quality within a collaborative learning atmosphere, promoting critical thinking and nurturing creativity, and instructing students on the importance of verifying and fact-checking their written work. Collectively, these studies illuminate the impact of AI applications on students' development of writing skills, demonstrating the value of AI tools in generating writing concepts, providing feedback, fostering vocabulary expansion, improving writing outcomes, and stimulating critical thinking and creativity. Additionally, they underscore the importance of considering ethics when integrating AI technologies into educational settings.

## III. METHODS

The study detected language learners' generative AI literacy in learning EFL writing skills. Therefore, the descriptive-survey research design was utilized to collect data using a closed questionnaire and an interview from EFL learners at higher education institutions. The descriptive-survey research design is frequently utilized in studies aiming to characterize a population or phenomenon. It serves to gather information regarding the current status, prevalence, distribution, or correlation of variables within a given population or sample. This research methodology finds application across various fields such as social sciences, marketing research, and public health studies, where the comprehension and depiction of specific attributes or behaviors hold significance. In descriptive-survey research, data collection typically involves conducting surveys, administering questionnaires, or conducting interviews. The primary objective for researchers is to offer a snapshot of the population or phenomenon being studied, without endeavoring to manipulate variables or establish causal relationships. Instead, they concentrate on summarizing and presenting the gathered data in a manner that yields meaningful insights and conclusions about the subject of interest [25]. Figure 1 shows the study's conceptual framework.

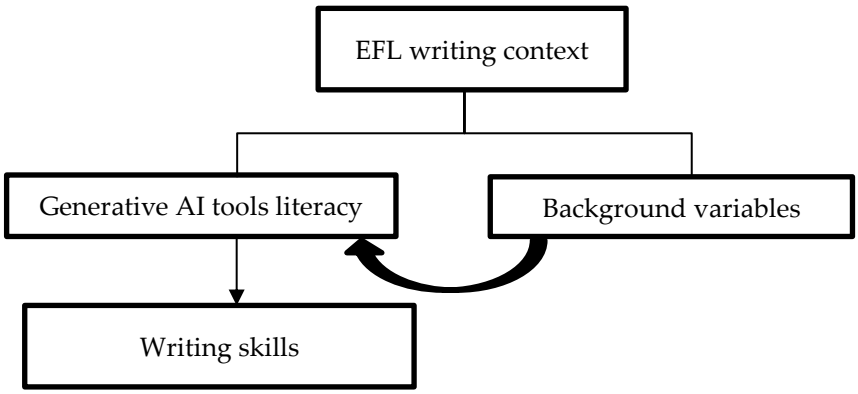


FIGURE 1. Conceptual Framework of the Study

The study aims to explore EFL learners' generative AI tools literacy in learning EFL writing skills. It also seeks to explore how students' background variables, including academic specialization, GPA, and mastery level with AI tools, affect the responses.

## 1. *POPULATION AND SAMPLE OF THE STUDY*

The study's population consisted of EFL undergraduates studying in a public higher education institution in Saudi Arabia. They learn English as a foreign language at the undergraduate level in the departments of English and translation. The study applied the convenient sampling method to draw the study sample. The questionnaire's link was created using Googleforms and shared with the study population using official and unofficial channels such as WhatsApp, Blackboard, email, and calls. The respondents gave their consent forms attached to the questionnaires to participate in the study. The questionnaire links were made available for two weeks. The number of respondents reached 278. In addition, purposive sampling was used to select the intended interviewees (no=20). Table 1 provides insights into the distribution of respondents based on their specialization, GPA ranges, and proficiency levels in generative AI tools. It gives a quick overview of the characteristics of the surveyed group in these key areas.

**Table 1.** Distribution of respondents based on specialization, GPA, and proficiency level in generative AI Tools.

| Variable | Category | No. | % |
|---|---|---|---|
| Specialization | Translation | 84 | 30.2 |
| | English | 194 | 69.8 |
| GPA | 4-5 | 153 | 55.0 |
| | 3-3.99 | 96 | 34.5 |
| | 2-2.99 | 29 | 10.4 |
| Mastery level of generative AI tools | Beginner | 124 | 44.6 |
| | Intermediate | 83 | 29.9 |
| | Advanced | 71 | 25.5 |
| Total | | 278 | 100 |

There are a total of 278 respondents in the study. 30.2% of the respondents have a specialization in "Translation," while 69.8% specialize in "English." The majority of respondents (55.0%) have a GPA in the range of 4-5. The rest are distributed among the 3-3.99 GPA range (34.5%) and the 2-2.99 GPA range (10.4%). The largest group of respondents (44.6%) are classified as "Beginner" in the mastery level of generative AI tools. The rest are split between "Intermediate" (29.9%) and "Advanced" (25.5%).

## 2. *STUDY TOOLS*

A closed-item questionnaire and a semi-structured interview were used to collect data to answer the research questions. The closed questionnaire was developed based on the literature review [26-27]. It included 29 items in its initial version. The attitudinal scale explored the EFL learners' literacy of using generative AI tools in developing their EFL writing skills. The questionnaire's items were formulated to understand how generative AI tools can contribute to language learners' development of EFL skills, such as paraphrasing, brainstorming,

revising, getting feedback, correction mistakes, asking questions, suggesting words, etc. The study's closed questionnaire was conducted online using platforms like Google Forms with participants receiving a link to access it. The questionnaire included clear instructions explaining the study's purpose and how their responses would be used to analyze their generative AI tools literacy in EFL writing context. To gauge these perceptions, the questionnaire employed a Likert scale, offering response options from "Strongly Disagree" to "Strongly Agree." A five-point Likert scale was used to respond to the closed questionnaire as follows: Strongly agree (5) - strongly disagree (1). This format aids the researcher in analyzing the responses.

As for the interview, it included three questions about the respondents' views of challenges arising from using generative AI tools for learning the EFL writing skills, affordance and suggestions form maximizing your literacy of generative AI tools in developing writing skills. Interview questions as listed below were tailored based on the research objectives and initial survey findings. Participants were chosen from the pool of questionnaire respondents who were willing to participate and whose responses were relevant to the study's objectives. Interviews were conducted either in person or online, depending on participants' preferences and logistical considerations, with each interview lasting approximately 6-10 minutes. Responses were documented through written notes or audio recordings to ensure the accurate capture of all relevant data.

1- What challenges may you face in using generative AI tools to develop learning writing skills?

2- What affordance may generative AI tools offer to develop learning writing skills?

3- What are your suggestions form maximizing your literacy of generative AI tools in developing writing skills?

## 3. *VALIDITY AND RELIABILITY*

A panel of five experts specializing in computer-assisted language learning and teaching meticulously reviewed both the questionnaire and interview. Their primary focus was to ensure that the study tools were capable of effectively addressing the research questions outlined in the study. Additionally, the experts scrutinized the language integrity and clarity of the tools, ensuring that they could gather pertinent and answerable data. In response to the experts' feedback, several enhancements were made to the tools, resulting in their final versions. The experts recommended specific improvements, including the addition of an introductory video detailing the role of generative AI tools in in learning the EFL writing skills. They also suggested elaborating on certain items to enhance specificity and rewriting some items for clarity. Following the incorporation of these expert suggestions, the questionnaire underwent revisions and ultimately comprised 29 closed items in its final version. To validate its construct, the closed questionnaire was administered to a subset of 20 respondents, distinct from the main sample. Pearson correlation and Cronbach Alpha's equation were employed to assess construct validity and reliability, respectively. The results showed that the correlation coefficients between items and the overall scale were statistically significant at the 0.01 and 0.05 significance levels. The correlation coefficients ranged from 0.513 to 0.895, and all of them are significant at both the 0.01 and 0.05 levels. These results indicate that there is a meaningful and consistent relationship between the quality or content of items and the overall scale. The strength of the correlation coefficients (ranging from 0.513 to 0.895) further implies that the relationship is not only statistically significant but also relatively strong. Therefore, one could infer that the content or quality of items, as measured by the study, is a valid predictor or indicator of measuring the research objectives. In other words, variations in item quality are associated with variations in overall grades, supporting the idea that the measure used for paragraphs is a valid tool for predicting or assessing research objectives.

Moreover, the reliability coefficients for the overall grade using Cronbach's alpha equation were calculated for the study tool. The results resulted in a reliability coefficient of 0.95. This result reflects a reliable and internally consistent measurement instrument. Researchers can trust that the tool provides consistent and dependable results when assessing the overall grade in the given context. The following grading scale was adopted for assessing the performance of the study tool's items to determine the approval score based on the Range Equation: 1-1.80= very low degree, 1.81-2.60= low degree, 2.61-3.40= medium degree, 3.41-4.20= high degree, 4.21-5.00= very high degree.

## 4. *DATA ANALYSIS*

Before conducting quantitative analysis, the data underwent several preprocessing steps to ensure its accuracy and reliability. These steps included cleaning the data to address issues such as missing values, outliers, and inconsistencies. Missing values were either filled in or excluded, outliers were identified and corrected or removed, and inconsistencies were resolved. Additionally, data transformation techniques were applied to normalize the data, particularly for variables that were not normally distributed. Variables were also standardized using normalization techniques to ensure comparability across different scales. Non-relevant or redundant variables were excluded from the dataset, and categorical variables were appropriately coded for analysis. Finally, the preprocessed data was verified to ensure that all preprocessing steps were correctly applied, and the dataset was

deemed ready for quantitative analysis. These preprocessing steps were crucial for ensuring the accuracy and reliability of the analysis results [28].

Quantitative data analysis was conducted utilizing SPSS version 25, extracting means, standard deviations, and ranks to assess the respondents' perceptions in generative AI tools and their impact on the development of writing skills in English as a foreign language. Moreover, a check for normal distribution of data was performed using Kolmogorov-Smirnova to determine suitable measures for analyzing the influence of background variables such as specialization, gender, and level on responses. The data distribution was not found normal; therefore, the Kruskal-Wallis test and Mann-Whitney U test were used to analyze the data and show differences in responses. The Kruskal-Wallis test is a non-parametric statistical method used to determine if there are statistically significant differences among three or more independent groups. It serves as an alternative to one-way analysis of variance (ANOVA) when ANOVA's assumptions, such as normality and homogeneity of variances, are not met. This test involves ranking all data points across the groups and then calculating a test statistic based on these ranks. If the resulting p-value is below a specified significance level (typically 0.05), it indicates a significant difference in the medians of at least two groups. However, the test does not identify which specific groups differ from each other; additional post-hoc tests are usually required for that purpose [29]. The Mann-Whitney U test, a non-parametric statistical method, is utilized to compare the medians of two independent groups when the assumptions of the independent samples t-test are not met. This test entails ranking all data from both groups together and calculating the sum of ranks for each group. Subsequently, the test statistic U is derived from these sums of ranks to ascertain whether a significant difference exists between the two groups' medians. If the resulting p-value falls below a specified significance level (typically 0.05), the null hypothesis, which posits no difference between the medians, is rejected, indicating a significant difference between the groups [30].

For the qualitative aspect, the data from the interview underwent analysis employing Braun and Clarke's [31] thematic analysis model. This involved a meticulous process of reading, editing, and categorizing the data under main ideas and themes to derive meaningful insights.

## IV. RESULTS

### *1. LEARNERS' GENERATIVE AI LITERACY IN LEARNING WRITING SKILLS*

Table 2 presents mean scores, standard deviations, and categorization levels for a survey assessing language learners' generative AI literacy in learning EFL writing skills.

**Table 2.** Descriptive statistics (generative AI literacy in writing).

| No. | Items | Mean | Std. Deviation | Level |
|---|---|---|---|---|
| 1. | I can use generative AI tools to translate texts. | 3.41 | 1.461 | High |
| 2. | I can use generative AI tools to get help with assignments | 3.12 | 1.344 | Medium |
| 3. | I can use generative AI tools to review the lecture | 2.83 | 1.458 | Medium |
| 4. | I can use generative AI tools to brainstorm ideas | 3.12 | 1.273 | Medium |
| 5. | I can use generative AI tools to find sources to support my writing | 3.35 | 1.395 | Medium |
| 6. | I can use generative AI tools to assess their work and receive real-time feedback | 2.62 | 1.240 | Medium |
| 7. | I can use generative AI tools to get help with punctuation, spelling, and capitalization | 3.42 | 1.346 | High |
| 8. | I can use generative AI tools to ask questions about the lecture | 3.09 | 1.454 | Medium |
| 9. | I can use generative AI tools to generate a sample essay or paragraph | 2.83 | 1.478 | Medium |
| 10. | I can use generative AI tools to revise a draft | 2.96 | 1.321 | Medium |
| 11. | I can use generative AI tools to brainstorm and organize thoughts prior to writing | 2.90 | 1.574 | Medium |
| 12. | I can use generative AI tools to paraphrase sentences | 3.26 | 1.378 | Medium |
| 13. | I can use generative AI tools to improve sentence structure and expressing ideas more clearly | 3.12 | 1.442 | Medium |
| 14. | I can use generative AI tools to generate writing samples | 3.37 | 1.390 | Medium |
| 15. | I can use generative AI tools to perform grammar checks and provide real-time corrections | 3.21 | 1.461 | Medium |
| 16. | I can use generative AI tools to structure essays logically and suggest areas for improvement | 3.16 | 1.380 | Medium |
| 17. | I can use generative AI tools to refine sentence structure and enhance coherence by suggesting better phrasing and removing redundancies | 2.94 | 1.206 | Medium |

| | | | | |
|---|---|---|---|---|
| 18. | I can use generative AI tools to craft compelling pieces of writing in various styles and formats | 2.83 | 1.325 | Medium |
| 19. | I can use generative AI tools to simulate conversations | 3.17 | 1.199 | Medium |
| 20. | I can use generative AI tools to stimulate creativity and idea expansion | 3.32 | 1.363 | Medium |
| 21. | I can use generative AI tools to suggest synonyms or more sophisticated words | 3.41 | 1.348 | High |
| 22. | I can use generative AI tools to learn and use new vocabulary | 3.72 | 1.411 | High |
| 23. | I can use generative AI tools to suggest varied vocabulary to replace frequently used words or phrases | 3.12 | 1.378 | Medium |
| 24. | I can use generative AI tools to suggest transition words and phrases to link ideas | 3.17 | 1.247 | Medium |
| 25. | I can use generative AI tools to suggest proper wording | 3.01 | 1.445 | Medium |
| 26. | I can use generative AI tools to suggest idiomatic expressions | 2.92 | 1.479 | Medium |
| 27. | I can use generative AI tools to generate content based on a given prompt | 3.32 | 1.453 | Medium |
| 28. | I can use generative AI tools to provide writing prompts | 3.16 | 1.377 | Medium |
| 29. | I can use generative AI tools to make writing clearer and more concise | 3.42 | 1.380 | High |
| | Total | 3.15 | 1.134 | Medium |

Table 2 shows that language learners generally express a positive level of utilizing generative AI tools for various EFL writing tasks. While some tasks received higher agreement levels (categorized as "High"), others fall into the moderate agreement range (categorized as "Medium"). Mean scores represent the average agreement level with each statement. Values above (3) indicate positive agreement, while those below (3) suggest lower agreement. Notably, several items received mean scores above (3), reflecting a generally positive perception toward the use of generative AI tools for various writing tasks. Items are categorized into "High," or "Medium,". The categorization "High" indicates a high level of agreement, while "Medium" suggests moderate agreement. Items 1, 7, 21, 22, and 29 demonstrate high agreement, indicating that respondents feel confident using generative AI tools for tasks such as translation, punctuation/spelling/capitalization help, suggesting synonyms, learning new vocabulary, and making writing clearer and more concise.

Many items fall into the medium agreement range. This includes tasks such as getting help with assignments, reviewing lectures, brainstorming, finding sources, and various writing-related activities. The total mean score for all items related to language learners' literacy in generative AI for EFL writing skills is 3.15, indicating a moderate level of agreement on average. The results suggest a generally favorable perception of the potential benefits of AI tools in enhancing language learners' writing skills.

## 2. *LEARNERS' ANSWERS ACCORDING TO THEIR SPECIALIZATION AND MASTERY LEVEL OF GENERATIVE AI TOOLS*

Table 3 provides results from a Mann-Whitney U test, which is a non-parametric test used to compare two independent groups when the dependent variable is ordinal or continuous. Also, the Kruskal Wallis Test was used to compare three or more independent groups that exhibit non-normally distributed data. In this case, the compared variables are "Specialization," "GPA," and "Mastery Level" in the context of their impact on the study sample's responses to language learners' literacy of generative AI in learning EFL writing skills.

**Table 3.** Comparison of variables and their impact on AI literacy level.

| **Total** | **Variable** | **N** | **Mean Rank** | **Sum of Ranks** | **Mann-Whitney U** | **. Sig.** |
|---|---|---|---|---|---|---|
| Specialization | Translation | 84 | 128.12 | 10762.00 | 7192.000 | .120 |
| | English | 194 | 144.43 | 28019.00 | | |
| | Variable | N | Mean Rank | | df | Asymp. Sig. |
| GPA | (4-5) | 153 | 162.52 | | 2 | |
| | (3-3.99) | 96 | 132.15 | | | .000 |
| | (2-2.99) | 29 | 42.41 | | | |
| Mastery level | Beginner | 124 | 154.81 | | 2 | |
| | Intermediate | 83 | 122.43 | | | .012 |
| | Advanced | 71 | 132.72 | | | |

The data presented in Table 3 indicates significant differences in GPA and mastery level, but not in Specialization. In terms of GPA, there is a clear distinction in mean ranks across different GPA ranges (4-5, 3-3.99, 2-2.99), with students scoring 4-5 exhibiting significantly higher mean ranks than those with lower GPAs.

Similarly, regarding mastery level, there is a notable difference in mean ranks between students categorized as Beginners, Intermediate, and Advanced, with Beginners showing significantly higher mean ranks compared to Intermediate or Advanced students. These findings suggest that GPA and mastery level are influential factors in students' literacy of generative AI in learning EFL writing skills, while specialization does not appear to have a significant impact.

### *3. CHALLENGES AND SUGGESTIONS FOR IMPROVING LITERACY OF GENERATIVE AI TOOLS IN LEARNING WRITING SKILLS*

The semi-structured interview showed information related to challenges and weaknesses encountered while using generative AI tools in learning English as a Foreign Language (EFL) writing skills. These challenges encompass issues such as disorganized content and vocabulary challenges, acquiring the skill of using generative AI tools. There is potential disorganization in generated content and the presentation of unintended ideas as shown in the following excerpts. S2 said, "errors", and S3 added, "It may be unorganized or give an idea that is not what is required, such as ideas or things that I write myself and review myself". Also, S12 answered, "How to arrange". In addition, there are challenges in finding specific words, weakness in manipulating language, and issues related to the rapidity of language processing. S5 added, "Not being able to find some words". S6 answered, "Weakness of manipulation". S7 told, "Weakness of rapidity"

Moreover, some interviewees expected a few problems with acquiring AI-related skills which are likely to be minimal, in contrast to other skill sets. S18 said, "It is expected that the problems that may hinder the acquisition of this skill will be few, unlike other skills."

Concerning affordance of generative AI tools in learning EFL writing skills, these tools are considered easy to use and beneficial in enhancing education through personalized learning experiences and improved assessment tools. The interviewees highlighted some aspects such as ease of use, AI in education benefits, virtual teachers supported by AI, and enhanced assessment tools. To detail, generally, these tools are described as easy to use and reliable, with no major issues reported. S3 said, "It's easy to use and reliable most of the times". Also, the interviewees recognized that generative AI tools would provide tailored learning experiences and interactive educational programs. S6 said, "It helps me to resolve very curly in learning writing skills." S9 added, "AI leverages the ability to advance education by providing personalized learning experiences to each student based on their unique learning styles, interests, and abilities." In addition, they acknowledged that the positive impact of virtual teachers supported by AI in improving children's learning needs and providing interactive educational experiences. S10 told, "One of the applications of artificial intelligence in education is virtual teachers supported by artificial intelligence, as they help improve children's learning needs and provide an interactive educational experience." Finally, they recognized AI's role in providing enhanced assessment tools, real-time feedback, and tracking student progress, strengths, and weaknesses. S14 added, "AI-enhanced assessment tools provide real-time feedback, track students' progress and identify their strengths and weaknesses." Overall, AI-tools are considered easy to use and beneficial in enhancing education through personalized learning experiences and improved assessment tools.

The suggestions for maximizing students' understanding of AI-tools to improve their EFL writing skills include enrolling in training courses, gaining experience in both English and AI, and fostering curiosity for personal development. The interviewees highlighted the need for having training on the use of generative AI tools that help them improving their learning of writing skills. S3 added, "It is possible to obtain training courses", and S18 answered, "Offering free courses to explain how to use these tools to learn skills." Students also need to have experience in the English and AI to improve their writing learning. S5 told, "You must have experience in the English language and artificial intelligence." In addition, fostering curiosity was suggested to improve the use of AI in learning English. S6 added, "I agree to AI generative tools because it helps me for many ways of my staying. But I want to have a good curiosity in using the AI to further develop my knowledge."

## V. DISCUSSION

### *1. RQ1: WHAT ARE THE EFL LEARNERS' GENERATIVE AI TOOLS LITERACY OF LEARNING WRITING SKILLS?*

The results showed that language learners generally showed a medium level of generative AI tools literacy in learning EFL writing skills. This result can be attributed to several reasons. The efficiency and quick assistance provided by AI tools save time and effort, aiding learners in tasks such as learning new vocabulary, improving writing clarity, and refining overall writing styles. The versatility of AI tools, offering functions from translation to brainstorming, makes them applicable across various writing-related activities and aspects of language learning. Positive experiences with the accuracy of AI tools, especially in spelling and capitalization tasks, contribute to a favorable literacy, establishing trust for reliable assistance in assignments and lecture reviews.

Learners' confidence in using AI tools empowers them to address complex writing tasks with assurance, as these tools act as supportive aids, boosting self-assurance in their writing abilities. The adaptability of AI tools to individual learning styles, providing personalized assistance based on specific needs, enhances the overall learning experience and increases receptivity to these tools. The positive feedback loop created by previous successful experiences encourages learners to maintain a favorable literacy and continue using AI tools. The integration of AI tools into various aspects of the learning routine makes them a natural and accessible part of the learning process, allowing learners to conveniently incorporate these tools into tasks like finding sources or seeking help with assignments. In summary, generative AI tools literacy in EFL writing tasks stem from their efficiency, versatility, reliability, adaptability, and the continuous positive feedback loop created by successful experiences, positioning these tools as valuable assets that enhance the overall learning and writing experience for language learners. The current result coincides with the review of literature that emphasizes the role of generative AI tools in optimizing education in general and English language learning in particular [19, 20, 24, 22, 21].

### 2. *RQ2: DO LEARNERS' GENERATIVE AI TOOLS LITERACY VARY BASED ON THEIR SPECIALIZATION AND MASTERY LEVEL?*

The results showed no differences in the study sample's responses attributed to their specialization. There was no statistically significant difference between the "Translation" and "English" groups in terms of their impact on the total score of the study sample's responses to language learners' literacy of generative AI in learning EFL writing skills.

The absence of differences in the study sample's responses based on their specialization (in "Translation" and "English") regarding the impact of generative AI on language learners' literacy in learning EFL writing skills may be attributed to several factors. Both groups, whether in "Translation" or "English," may have comparable exposure and familiarity with generative AI tools. If these tools are commonly utilized or integrated into the curricula of both specializations, it can result in consistent perceptions across the groups. Additionally, the teaching methods and pedagogical approaches employed in both specializations may not significantly vary concerning the incorporation or emphasis on the use of AI tools. If educators in both groups adopt similar strategies, learners are likely to share similar perceptions. Moreover, the study sample may possess a common educational background, potentially mitigating differences in their perceptions. If both groups have undergone similar training or coursework related to AI tools, it might contribute to uniformity in their responses. Furthermore, the learning environments for the respondents may be homogeneous in terms of resources, technology integration, and instructional approaches, thereby contributing to the lack of differentiation in their perceptions.

Besides, the respondents' GPA and mastery level of using generative AI tools in learning EFL writing skills did impact their responses. There was a statistically significant difference between two GPA groups (4-5, 3.3.99) and two mastery level groups (intermediate, advanced) in their impact on the total score of the study sample's responses to literacy of generative AI in learning EFL writing skills. The observed statistically significant differences in the study sample's responses based on GPA and mastery level in using generative AI tools for learning EFL writing skills can be explained by several factors. Learners with a higher GPA often exhibit a more dedicated approach to their studies, reflecting a strong academic commitment. This cohort tends to be more meticulous in their attention to details, including the utilization and impact of generative AI tools, leading to perceptions that are nuanced and well-informed. The differences in perceptions within this group may be influenced by their unique academic experiences and individual preferences. Furthermore, learners with advanced and intermediate mastery in using generative AI tools are likely to possess a profound understanding of the functionalities and applications of these tools. Their heightened skills enable them to leverage AI tools more effectively for EFL writing tasks, resulting in more positive perceptions. The varying levels of mastery contribute to differences in how these learners perceive the impact of AI tools on their writing skills in the context of learning English as a Foreign Language.

### 3. *RQ3: WHAT ARE THE LEARNERS' VIEWS OF GENERATIVE AI TOOLS LITERACY IN LEARNING WRITING SKILLS?*

The analysis of the interviews revolved around three major themes: Challenges, affordance, and suggestions. Language learners face challenges with generative AI tools in EFL writing, including disorganized content and vocabulary difficulties. Some struggle with arranging ideas, finding specific words, manipulating language, and the speed of language processing. Learners anticipate minimal problems in acquiring AI-related skills compared to other skill sets. Concerning affordance, generative AI tools are seen as easy to use and beneficial for personalized learning experiences and improved assessments. Interviewees highlight the tools' reliability, with

positive comments on their ease of use and recognition of AI's positive impact on education, including virtual teachers supporting children's learning needs and enhanced assessment tools. Regarding suggestions, recommendations for maximizing understanding include enrolling in training courses to enhance AI-tool skills. Gaining experience in both English and AI is emphasized as essential for improving writing skills. Fostering curiosity is suggested to enhance the use of AI in learning English, with an emphasis on personal development. In summary, learners face challenges with disorganized content and vocabulary while using generative AI tools for EFL writing. However, they find these tools easy to use, beneficial, and supportive of personalized learning experiences. Suggestions include training courses, gaining experience in English and AI, and fostering curiosity for effective use of AI in improving writing skills.

## VI. CONCLUSION

The study's findings provide insight into language learners' perspectives on integrating generative AI tools into the development of their EFL writing skills. The overall positive perceptions exhibited by participants reflect that the learners are literate of generative AI tools, and these tools are capable to improve EFL writing skills. In addition, the research disclosed that learners' literacy level of generative AI tools was not notably affected by their academic specialization. However, two crucial factors, namely Grade Point Average (GPA) and mastery level of using generative AI tools, did influence their literacy level of generative AI tools. This underscores the significance of learners' competence in AI technologies in shaping their perceptions and preferences for incorporating these tools into language learning. The analysis of semi-structured interviews revealed three major themes: challenges, affordances, and suggestions. Learners identified obstacles linked to AI use in language learning, acknowledged the advantages offered by generative AI tools, and provided valuable recommendations for improving the integration of AI in EFL writing instruction. Implications of the study propose that educators and curriculum developers consider the positive reception of generative AI tools among language learners. Focused efforts should be made to provide adequate training and support to enhance learners' proficiency in utilizing AI technologies. Additionally, addressing the challenges highlighted by learners can contribute to the successful implementation of AI in language learning contexts. Several constraints should be considered when interpreting the findings. The sample, comprising EFL undergraduates from a particular institution in Saudi Arabia, might introduce selection bias, limiting its representativeness. The use of a convenient sampling method and reliance on self-reported data raise concerns about the generalizability and accuracy of responses. Additionally, the two-week data collection period may not capture potential fluctuations in perceptions over time. The study's narrow focus on specific departments may restrict the applicability of findings to students in other disciplines within the institution. These limitations highlight the importance of exercising caution when extending the results to broader contexts and suggest areas for methodological refinement in future research on similar subjects. The study emphasizes the ongoing necessity for research and development to explore innovative approaches to incorporating AI in language education, ensuring its smooth integration and positive impact on learners' writing skills. Further studies could investigate the effects of using generative AI tools on language learners' writing abilities over time. Additionally, comparative research could be conducted to evaluate the effectiveness of different AI technologies in improving writing learning outcomes across a range of proficiency levels.

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