

The Impact of E-Learning Training Strategies on Research Writing Performance: Perspectives of Saudi EFL University Students

Kholod Sendi

Department of English and Translation, Saudi Electronic University, Riyadh, Saudi Arabia

Najah Alsaedi

Department of English and Translation, Saudi Electronic University, Riyadh, Saudi Arabia

Abstract—This study examines Saudi EFL university students' perceptions of the impact of e-learning training strategies on their research writing performance and explores the influence of gender, GPA, and age. A quantitative cross-sectional questionnaire was used to collect the data from 160 EFL students at Saudi Electronic University (SEU). The data were analyzed using IBM SPSS Statistics version 22. The findings revealed that most of the participants had positive perceptions toward e-learning strategies, such as using slideshows, word processors, interactive videos, collaborative e-learning tools, and e-discussion groups. Only a few participants reported some challenges, such as difficulty tracking their progress in e-learning, frustration with the online system, and having trouble maintaining focus. In addition, the findings showed that there is no statistically significant effect of gender or GPA on students' perceptions. However, the participants' age significantly influenced their perceptions. The study concludes with several recommendations for future research.

Index Terms—E-Learning, training strategies, research methodology, EFL research writing, Saudi students

I. INTRODUCTION

Education has witnessed a substantial revolution through new technologies and innovation. Technology, primarily through the use of the internet and computers, has enabled the provision of education in settings other than traditional classrooms. Consequently, many different terms in education have emerged to describe the learning process via technology, such as electronic learning (e-learning), mobile learning, online learning, digital learning, virtual learning, distance learning, computer-assisted instruction, technology-enhanced learning (TEL), and many other related terms (Kamarudin et al., 2024; Kumar Basak et al., 2018; Valverde-Berrocoso et al., 2020). Although some of these terminologies have been used interchangeably, several researchers have highlighted their similarities and differences (Kumar Basak et al., 2018).

Focusing on the e-learning concept, e-learning is defined as a method of facilitating, delivering, and enhancing the teaching-learning process using electronic technologies, including computers, mobile devices, and internet platforms. It utilizes interactive and multimedia content to increase learners' engagement and achievement (Belvin & Mamnzenzu, 2025).

Numerous research studies have examined the benefits and drawbacks of e-learning, concluding that its benefits outweigh its drawbacks (Abdalmenem et al., 2019; Amastini et al., 2025; Ebrahim, 2024; Ilie & Stefan, 2022). E-learning develops educational proficiency not only in education but also in research performance (Abdalmenem et al., 2019). E-learning promotes a student-centered approach, increases flexibility, offers communicative and interactive features, facilitates collaborative learning, caters to individual needs, and decreases expenses (Amastini et al., 2025; Ilie & Stefan, 2022). Despite the temporal and spatial boundaries, learners have unlimited access to lectures and other online material. In an e-learning environment, instructors serve as facilitators rather than content and material providers, and students become scholars and explorers of knowledge (Abdalmenem et al., 2019). In higher education, e-learning is utilized primarily to offer a highly qualified educational experience (Garrison, 2011).

Moreover, developing competence in research methods and research writing plays a critical role. Research methods courses are important for undergraduates to prepare and train them to conduct research and write research reports in their future graduate studies. Furthermore, these courses can help students not only to master research skills but also to use their critical thinking and identify answers to real-life problems (Erlinda et al., 2022; Setiawan & Sembiring, 2023). However, previous research studies confirmed that teaching and learning research methodology and research writing are considered challenging for both teachers and learners due to the complexity of the research content and students' low motivation (Qasem & Zayid, 2019; Sendi & Alhumsi, 2023). Mastering research writing and research skills would be even more challenging for EFL students who may face linguistic difficulties and, at the same time, have no prior experience in the research field (Bakhou & Bouhania, 2020; Gupta et al., 2022). To overcome the challenges associated with teaching research methods and research writing, several scholars argued that implementing and integrating e-learning

strategies can facilitate research methods teaching and learning, increase students' engagement and productivity, and improve students' research writing performance (Abdalmenem et al., 2019; Chakma et al., 2021; Eviyanti et al., 2020; Olivier, 2014; Wu & Patel, 2016). Hence, the current paper sheds light on e-learning strategies in a higher education institution in a context that requires more investigation, namely, Saudi Arabia.

A review of previous research on using e-learning strategies in teaching research methodology and EFL research writing showed some important gaps in the literature. Motjolopane (2021) reported that "despite challenges in teaching research methodology, historically, the area has received little attention in academic research" (p. 35). Furthermore, Setiawan and Sembiring (2023) pointed out that little research has been done on research courses at the undergraduate level compared to the graduate level. In addition, although there is an extensive body of literature on e-learning strategies in Saudi Arabia, few scholars have examined Saudi students' perceptions of e-learning (Alhumsi et al., 2021) and, particularly, in the EFL field (Mutambik, 2018). Moreover, limited studies have examined gender-based differences in students' perceptions of e-learning in the EFL context (Ramli et al., 2022).

Interestingly, this study addresses these gaps in the literature by examining the perceptions of undergraduates majoring in English Language and Translation at Saudi Electronic University (SEU). Therefore, this research investigates EFL students' perception of the impact of e-learning training strategies on their research writing performance. Furthermore, this study explores how variables such as gender, GPA, and age influence their perceptions. The research questions that guide this study are:

- 1- What are the EFL students' perceptions of the impact of e-learning training strategies on their research writing performance?
- 2- Is there a significant difference in how EFL students perceive the impact of e-learning training strategies based on their gender, age, and GPA?

This research study provides recommendations for teaching research writing courses in the e-learning environment. By answering the above questions, this study brings Saudi EFL students' voices to the literature. Furthermore, it contributes to the knowledge related to the fields of e-learning and research writing.

II. LITERATURE REVIEW

A. E-Learning Training Strategies

The current students in higher education belong to a generation that witnessed a flow of digital transformation. This generation of learners is part of the digital native generation that relies on electronic devices for communication, education, and entertainment (Ilie & Stefan, 2022). Students in this generation have different learning styles. They use "exploratory learning to make sense of the multitude of information" (Ilie & Stefan, 2022, p. 228). They can interact with technology and use it in their learning process. According to Pikhart and Klímová (2020), this generation is the Google generation that uses the Internet as a source of information. E-Learning involves the design of various training strategies that can support achieving learning outcomes (Abdalmenem et al., 2019). Based on the degree of using online tools, training strategies are classified into traditional (no online tools are used), web-oriented, blended learning, and online learning. E-learning training strategies can provide an authentic learning experience, in line with the new expectations of today's society. E-learning strategies make traditional learning more effective and attractive by using images, videos, animation, etc. (Ilie & Stefan, 2022). According to Abdalmenem et al. (2019), e-learning strategies could be defined as:

An integrated curriculum that uses a variety of methods, tools, and programs related to improving and developing the educational process, which contributes to the process of increasing the efficiency of performance in universities, achieving their goals, in addition to improving the knowledge, and access by the learner and teacher. (p. 10)

Because today's learners are different and have different needs, e-learning training strategies provide them with different tools and different ways to access information and meet their needs. E-learning training strategies can also provide equal learning opportunities for learners by overcoming spatial and temporal boundaries. Through these strategies, learners can interact and collaborate with peers and use social media in their learning process (Abdalmenem et al., 2019).

Regarding strategy types, Ilie and Stefan (2022) mentioned that e-learning includes three types of strategies or tools: curriculum tools that offer a systematic and typical learning environment, digital library tools that enable students to have effective access to information, and knowledge representation tools that help in formulating and representing information. Abdalmenem et al. (2019) pointed out that successful e-learning starts with careful planning, including selecting the best strategies. Most of the e-learning strategies are student-centered learning strategies. Moreover, to have an effective e-learning environment, educators must not only offer quality course design and delivery, but they must also employ appropriate assessments and encourage collaboration (Encarnacion et al., 2021). In an e-learning environment, learners are given the chance to control and direct their learning, use technology, interact with other learners, develop their critical thinking skills, and use these skills in real life (Encarnacion et al., 2021).

B. E-Learning in Higher Education in Saudi Arabia

The global proliferation of e-learning has been accelerated due to many factors, including the COVID-19 pandemic, which expedited its widespread adoption in educational institutions. This global trend has also been observed in Saudi Arabia. E-learning was first implemented in Saudi Arabia in the early 1990s when the Ministry of Higher Education

established the Computer and Information Center (Aljaber, 2018). Subsequently, many universities have instituted centers for distance and online learning, with King Fahd University for Petroleum and Minerals, King Khalid University, and King Saud University among the first. The National Center of E-learning and Distance Learning (NCEDL) was founded in 2005 to enhance e-learning experiences in higher education institutions by incorporating the most effective e-learning practices from around the world (Alqahtani & Rajkhan, 2020).

Recently, the Saudi government has made major contributions to the country's digital transformation plan, with a particular emphasis on education. Saudi Electronic University (SEU) was founded by the government in 2011 with the primary purpose of pioneering the use of educational technology for national growth and development. The SEU aims to achieve this goal by incorporating the most recent educational technologies and providing high-quality, flexible learning experiences.

Many universities in Saudi Arabia have adopted pre-existing systems to facilitate the e-learning experience. According to Anas (2020), 90% of Saudi universities use Blackboard as their primary learning management system (LMS). Blackboard, an American-based company, is recognized as a leading provider of LMS services (Klašnja-Milićević et al., 2016). It has the capability to provide synchronous and asynchronous forms of e-learning, with many features that facilitate individual or collaborative learning for students.

E-learning in Saudi Arabia has a strong position in the literature (Alhumsa et al., 2021). However, few research studies have examined students' perspectives on e-learning in the Saudi context (Alhumsa et al., 2021; Mutambik, 2018). Some studies examined the barriers that influence the application of e-learning in Saudi universities (Naveed et al., 2017); other studies investigated the effectiveness of e-learning in Saudi higher education (Algahtan, 2011). In addition, some studies focused on students' perceptions and showed that most Saudi learners have positive attitudes toward e-learning (Alhumsa et al., 2021; Mutambik, 2018).

C. Teaching Research Methodology and EFL Research Writing

Research methodology refers to the process of how a researcher can design a research study to get valid and reliable findings. This process includes addressing the aims and objectives of the research and how each research piece will be carried out (Setiawan & Sembiring, 2023). Teaching research methodology courses has a significant role in higher education. These courses are beneficial for undergraduate students to prepare and train them to conduct research as part of their academic progression. Mastering research skills helps students use their critical thinking, analyze research findings, and find answers to real-life problems (Erlinda et al., 2022; Setiawan & Sembiring, 2023).

However, it is evident from prior literature that research methods courses are considered challenging for both instructors and students (Setiawan & Sembiring, 2023; Qasem & Zayid, 2019). Several factors contribute to the difficulty of teaching and learning research methods courses. First, the course content and materials are complex or do not meet learners' needs. Second, learners' motivation to learn this content is low. Third, some learners cannot find a connection between the research course and their future education or career. Fourth, many instructors teach research courses by using traditional teacher-centered approaches or by focusing more on theoretical information than on the application of research skills (Erlinda et al., 2022; Setiawan & Sembiring, 2023).

Despite the difficulties that students encounter in research methods, historically, this field has received little attention from scholars (Motjolopane, 2021; Sendi & Alhumsa, 2023). More specifically, little research has been done on undergraduate research courses compared to graduate ones (Setiawan & Sembiring, 2023). According to Erlinda et al. (2022), the studies that targeted undergraduate students' perceptions toward research methods courses showed that these students perceived research methods courses negatively, considering them difficult, stressful, and complex. Only limited studies revealed that some students found learning research methodology interesting, informative, and challenging.

D. E-Learning Training Strategies and EFL Research Writing Performance

To overcome the difficulties of teaching and learning research methods and research writing, several studies pointed out that implementing student-centered approaches such as collaborative learning (Sendi & Alhumsa, 2023), project-based learning (Braguglia & Jackson, 2012), and active learning (Hoon & Singh, 2019) in teaching research courses had a positive impact on students' performance. These approaches increased students' interest and engagement and improved their understanding of the course content. For example, Sendi and Alhumsa's (2023) qualitative case study explored 137 Saudi students' perceptions of using collaborative learning in a research methodology course conducted in a blended learning environment. The results indicated that most of the participants believed that collaborative learning positively impacted their performance on the research course.

Several studies focused on integrating e-learning strategies to facilitate teaching and learning research methods (Abdalmenem et al., 2019; Chakma et al., 2021; Eviyanti et al., 2020; Olivier, 2014; Wu & Patel, 2016). E-learning strategies helped educators to implement student-centered approaches and encouraged learners to discover, interact, and build their own knowledge (Abdalmenem et al., 2019; Listyani, 2021). Abdalmenem et al. (2019) stated that "the increasing efficiency of research performance is linked to the ability of universities to employ e-learning to improve research" (p. 9). In addition, Eviyanti et al. (2020) examined the effectiveness of e-learning in teaching a research methods course by using Google Classroom as an LMS. According to Eviyanti et al. (2020), LMS is "an application that contains features needed in the learning process. LMS can make students and lecturers enter forums to discuss with each other, work on online quizzes, and access learning material anywhere and anytime while connected to the Internet" (p. 1). The

researchers found that students positively perceived e-learning, and most students agreed that using Google Classroom in teaching the research method course motivated them and improved their performance. Moreover, Olivier's (2014) qualitative study demonstrated how technology, and specifically how wikis can be utilized effectively in teaching sociolinguistic research methodology at an undergraduate level. The researcher reported that wikis enhanced learners' opportunities to discuss, reflect, cooperate, and interact in learning sociolinguistic research methods. Also, the researchers argued that Wikis can be used effectively in language classrooms. Similarly, Wu and Patel (2016) investigated the integration of traditional teaching and e-learning strategies with group work, peer interaction, and role plays to teach a mixed-methods research course. The researchers pointed out that this blended learning helped students achieve the learning outcomes and improved their performance.

In the EFL context, e-learning strategies have been increasingly used as effective tools to improve English language skills, including academic writing (Alhumsi et al., 2021; Guo & Li, 2024; Pikhart & Klímová, 2020). Furthermore, e-learning strategies helped students increase their vocabulary and communicate their thoughts (Ilie & Stefan, 2022). For example, Chakma et al. (2021) examined the use of online collaborative sessions by graduate EFL students to write their theses during COVID-19. The researchers argued that these collaborative virtual meetings provided students with a highly productive environment in which each student was able to achieve progress in writing his/her thesis. These online research writing sessions gave students the chance not only to share their work but also to get instructive and critical feedback.

III. METHODOLOGY

A. Research Design

This paper used a descriptive quantitative approach. According to Creswell (2012), this approach is relevant to numeric data collection as well as its statistical analysis. In the process of the data collection procedure, a cross-sectional questionnaire was adopted from Tsai's (2009) study. This tool identified Saudi EFL students' perspectives of the impact of e-learning training strategies on their research writing performance.

B. Participants and Instrumentation

The participants in the current study were students majoring in English Language and Translation who experienced e-learning sessions throughout their course of study. To identify Saudi EFL students' perspectives of the impact of e-learning training strategies on their research writing performance at Saudi Electronic University, this study included a total of 160 Saudi EFL university students, representing demographic features such as gender, diverse academic levels, and achievement backgrounds. The sample displayed a significant gender distribution pattern, with female students comprising 116 participants (72.5%) compared to 44 male students (27.5%). This ratio potentially reflects current enrollment trends in Saudi higher education, particularly in humanities and language-related disciplines. The distribution of students by academic years revealed that the largest group consisted of junior-level students (levels 5-6), accounting for 79 participants (49.4%). Freshmen (levels 3-4) comprised 45 students (28.1%), while seniors (levels 7-8) represented 36 participants (22.5%). This distribution provides comprehensive representation across different stages of undergraduate study, with particular emphasis on mid-program students who have substantial experience with university-level academic requirements. As for the academic performance factor, data showed that most participants maintained strong academic records. Fifty-nine students (36.9%) reported a "Good" GPA, followed by 49 participants (30.6%) in the "Very good" range and 42 students (26.3%) achieving "Excellent" standing. Only 10 participants (6.2%) fell into the "Pass" category, indicating that the sample predominantly consisted of academically high-achieving individuals. All demographic categories were mutually exclusive and collectively exhaustive, forming the full sample size of 160 participants.

C. Data Collection

The data for this study were collected through an online questionnaire designed to assess Saudi EFL university students' perceptions of e-learning strategies in research writing. The survey instrument utilized a 5-point Likert scale, which includes 12 items, with response options ranging from "Strongly Disagree" to "Strongly Agree." Before distribution, the questionnaire was validated through expert review by specialists in linguistics and applied linguistics. The final survey was administered online during the 2024-2025 academic year to 160 participants, ensuring broad representation across different variables (demographic characteristics). Participation was voluntary, and informed consent was obtained from all respondents. In addition, it took the respondents around ten minutes to complete the survey. To maintain data integrity, responses were anonymized, and the collected data were screened for completeness, with no missing values detected in the final dataset. Thus, this study adhered to strict ethical guidelines to ensure the protection of participants' rights and confidentiality. No personally identifiable information was collected, ensuring participant confidentiality. Participants were informed of their right to withdraw from the study at any time without consequences. These measures were implemented to maintain ethical integrity following international research standards. It is worth mentioning that this paper has been approved by the Research Ethics Committee (SEUREC-4461) at Saudi Electronic University.

D. Data Analysis

The quantitative data were analyzed using IBM SPSS Statistics version 22. Descriptive statistics, including means, standard deviations, and percentages, were computed to summarize participant demographics and survey responses. The

reliability of the measurement scales was confirmed using Cronbach's alpha, which indicated high internal consistency ($\alpha=0.83$) for all constructs. To examine group differences, independent samples t-tests were conducted to compare responses based on gender (male vs. female). Additionally, one-way ANOVA tests were performed to assess variations across academic levels (freshman, junior, senior) and GPA categories (Excellent, Very Good, Good, Pass). Statistically significant ANOVA results were applied to identify specific group differences.

IV. FINDINGS

The study explored Saudi EFL university students' perspectives of the impact of e-learning training strategies on their research writing performance. Table 1 presents Saudi EFL university students' perspectives of the impact of e-learning training strategies on their research writing performance.

TABLE 1
SAUDI EFL UNIVERSITY STUDENTS' PERSPECTIVES OF THE IMPACT OF E-LEARNING TRAINING STRATEGIES ON THEIR RESEARCH WRITING PERFORMANCE

Items	Mean	SD
1. I think e-learning training strategies are activated in research writing performance	3.84	1.17
2. I think online sessions are convenient when using slideshow in performing research writing tasks.	4.06	1.17
3. I am attracted to online learning when employing interactive videos in performing research writing tasks.	3.73	1.24
4. I am excited when adopting collaborative e-learning in doing research writing assignments.	3.83	1.21
5. I think using PowerPoints in online sessions are necessary in facilitating research writing tasks.	4.21	1.21
6. I am able to take notes online using word processors or graphics tools in performing research writing tasks.	3.95	1.16
7. I am able to use e-learning discussion via e-discussion groups in doing research writing assignments.	3.74	1.38
8. I am able to download files from the Internet in relation to research writing activities.	4.06	1.28
9. I do not have a good understanding of my progress in e-learning training strategies.	2.44	1.40
10. Online learning system always makes me feel frustrated when performing research writing tasks.	2.27	1.22
11. I am worried about my achievements in research writing tasks in e- collaborative learning.	2.42	1.35
12. I cannot focus on my online learning when using the relevant e-learning training strategies in doing research writing assignments.	2.31	1.29

In response to the first research question, the current paper revealed that a majority of Saudi EFL university students hold positive perceptions toward e-learning strategies in research writing. Most participants agreed that these strategies effectively enhanced their performance ($M = 3.84$, Item 1), with a strong consensus on the convenience of online sessions using slideshows ($M = 4.06$, Item 2). Additionally, interactive videos ($M = 3.73$, Item 3) and collaborative e-learning ($M = 3.83$, Item 4) were widely viewed as engaging tools for research writing tasks. The highest agreement was observed regarding the necessity of PowerPoints in facilitating research writing ($M = 4.21$, Item 5), further underscoring the preference for visually supported learning. A significant majority also reported confidence in utilizing digital tools, including word processors ($M = 3.95$, Item 6), e-discussion groups ($M = 3.74$, Item 7), and downloading online resources ($M = 4.06$, Item 8).

Despite these favorable trends, a notable minority faced some challenges. Some students struggled to track their progress in e-learning ($M = 2.44$, Item 9), while others expressed frustration with the online system ($M = 2.27$, Item 10). Concerns about performance in collaborative settings ($M = 2.42$, Item 11) and difficulties maintaining focus ($M = 2.31$, Item 12) were reported, though these represented a smaller subset of respondents. Overall, the findings suggest that most students benefited from e-learning strategies in research writing, particularly through structured, interactive, and visually aided methods. However, targeted interventions—such as progress-tracking mechanisms and reduced technical barriers—could address the challenges faced by a minority, further strengthening the efficacy of online learning in this context.

The second research question examines potential variations in Saudi EFL undergraduate students' perceptions regarding the influence of e-learning training strategies on their research writing performance, with gender, GPA, and age as moderating variables. To address this question, independent samples t-tests were employed to evaluate gender-based differences, whereas a one-way analysis of variance (ANOVA) was conducted to assess disparities across age groups and GPA levels. As illustrated in Table 2, the independent samples t-test revealed no statistically significant effect of gender on students' perceptions ($p = .24$), indicating that male and female respondents did not differ significantly in their perceptions of e-learning strategies' impact on research writing performance.

TABLE 2
INDEPENDENT SAMPLE T-TEST FOR UNDERGRADUATES' PERSPECTIVES ON GENDER

Items	Gender	N	Mean	SD	T	P
Responses of EFL undergraduates' perspectives of the impact of e-learning training strategies on their research writing performance	Male	44	39.50	2.68	-1.15	.24
	Female	116	41.35	2.92		

Concerning the age variable, a one-way ANOVA was conducted to examine differences in EFL undergraduates' perspectives of the impact of e-learning training strategies on their research writing performance. As demonstrated in

Table 3, the analysis yielded statistically significant variations among age groups ($p < .05$), suggesting that EFL university students' perspectives of the impact of e-learning training strategies on their research writing performance were indeed moderated by age.

TABLE 3
ANOVA FOR EFL UNDERGRADUATES' PERSPECTIVES AND THEIR AGE GROUP

Items	Age	N	Mean	SD	F	P
Responses of EFL undergraduates' perspectives of the impact of e-learning training strategies on their research writing performance	18-24	46	43.35	8.22	8.71	0.000
	25-34	91	40.85	7.56		
	35-44	12	42.17	2.03		
	More than 44	11	28.91	17.18		
	Total	160	40.84	9.06		

Table 4 presents the results of a one-way ANOVA examining potential differences in EFL undergraduates' perceptions of how e-learning training strategies influence their research writing performance across various GPA levels. The statistical analysis revealed no significant differences among GPA groups ($p = 0.15$), indicating that students' writing performance, as measured by GPA, did not substantially affect their perspectives of e-learning strategies' effectiveness for research writing performance.

TABLE 4
ANOVA FOR EFL UNDERGRADUATES' PERSPECTIVES AND THEIR GPA

Items	GPA	N	Mean	SD	F	P
Responses of EFL undergraduates' perspectives of the impact of e-learning training strategies on their research writing performance	Excellent	42	39.50	11.35	1.78	0.15
	Very good	49	43.31	7.66		
	Good	59	39.93	8.63		
	Pass	10	39.80	4.87		
	Total	160	40.84	9.06		

All in all, this study investigated how three key demographic variables, namely gender, age, and GPA, influence Saudi EFL undergraduates' perceptions of the effectiveness of e-learning strategies for research writing performance. Regarding gender, independent samples t-tests revealed no statistically significant difference between male and female students' evaluations ($p = .24$), indicating that perceptions of e-learning's impact were consistent across genders. In contrast, age emerged as a significant differentiating factor, with one-way ANOVA results showing substantial variations among age groups ($p < .05$), particularly in students' perspectives of e-learning strategies' effectiveness for research writing performance. However, academic achievement, as measured by GPA, demonstrated no significant effect on students' perspectives, with ANOVA results failing to reach statistical significance ($p = .15$). These findings collectively suggest that while learners' age meaningfully influences their reception of e-learning methodologies, neither their gender nor academic performance level substantially alters their assessment of these digital tools' efficacy for research writing achievement.

V. DISCUSSION

The findings of this study highlight predominantly favorable attitudes among Saudi EFL university students toward the use of e-learning strategies in research writing. Moreover, the present study's findings align consistently with previous research on e-learning effectiveness in academic contexts. A significant majority of Saudi EFL university students in our sample ($M = 3.84$) reported positive perceptions of e-learning strategies for research writing, mirroring results from Ebrahim's (2024) study on Arab EFL learners, which found digital tools enhanced writing outcomes. The strong preference for slideshow-assisted online sessions ($M = 4.06$) corroborates Pateşan's (2018) findings regarding the pedagogical value of visual aids in EFL settings. Furthermore, the results demonstrating student engagement with interactive videos ($M = 3.73$) and collaborative e-learning ($M = 3.83$) are particularly consistent with Guo and Li's (2024) mixed-methods research, showing these methods significantly improve writing performance across Asian EFL contexts. The highest-rated aspect, PowerPoint utility ($M = 4.21$), reinforces similar conclusions in Almelhi's (2021) Saudi-specific study on presentation tools in academic writing. The reported proficiency with digital tools (word processors $M = 3.95$; e-discussions $M = 3.74$; online resources $M = 4.06$) parallels the findings from AbuSeileek's (2006) study on the use of word processors and Alhawiti's (2023) investigation of Saudi students' capabilities in academic contexts. Despite the lowest-rated aspects ($M=2.27$, $M=2.42$), the items dealing with frustration and worries in online collaborative learning settings echo similar results in a study conducted by Capdeferro and Romero (2012), suggesting these challenges require targeted interventions.

As for the second research question, the independent samples t-test revealed no statistically significant effect of gender on students' perceptions ($p = .24$), indicating that males and females did not differ significantly in their views regarding the impact of e-learning strategies on research writing performance. This finding aligns with prior research showing that gender differences in e-learning perceptions are often negligible, as both male and female participants similarly value the use of digital tools (Al-qdah et al., 2025), engage similarly in writing tasks during online sessions (Alsaedi & Alhumsi, 2024), and adopt online learning strategies (Ramli et al., 2022; Tsai, 2009). The lack of significant variation suggests that

e-learning strategies are perceived equitably across genders, which may simplify instructional design by reducing the need for gender-specific adaptations in digital learning environments.

In contrast, the analysis yielded statistically significant variations among age groups ($p < .05$), suggesting that EFL university students' perspectives on e-learning strategies were moderated by age. Older learners may have different technological competencies or preferences compared to younger students, influencing their perceptions of digital tools. For example, older learners tend to exhibit greater confidence in both computer proficiency and learning skills compared to their younger counterparts (Morin et al., 2019). This finding supports the study conducted by Morin et al. (2019), indicating that age can influence their participation in online learning. Educators should consider these age-related differences by offering differentiated training or support to enhance engagement across all student demographics. Finally, the statistical analysis revealed no significant differences among GPA groups ($p = 0.15$), indicating that students' writing performance, as measured by GPA, did not substantially affect their perceptions of e-learning effectiveness. This result goes in line with Alsaedi and Alhumsi's (2024) research.

VI. CONCLUSION

Through a quantitative research approach, this study explored Saudi EFL university students' perception of the impact of e-learning training strategies on their research writing performance. The data were collected by using a cross-sectional questionnaire from 160 participants. Descriptive analysis was used to analyze the data. The findings indicated that most of the participants held positive perceptions of e-learning strategies in improving their research writing performance, especially those strategies that were structured, interactive, and visually aided. Furthermore, the results revealed that there is no statistically significant effect of gender or GPA on students' perceptions; however, age was found to be an important influencing factor.

It is recommended that Saudi universities incorporate and activate e-learning tools to prepare students to meet the skills of the 21st century. Educators and curriculum designers should benefit from recent interactive and collaborative technologies, particularly those that offer visual support, in designing research writing courses. In addition, instructors in e-learning environments are facilitators of knowledge and are required to choose the most effective e-learning training strategies for their students based on the learning objectives, the course content, the availability of technology, and students' age (Ilie & Stefan, 2022). Instructors should encourage students to use these e-learning tools while providing supervision, clear guidance, and constructive feedback.

Regarding limitations, all the participants in this study were enrolled at a single university, SEU. Therefore, it is highly recommended that future research studies include participants from different universities across Saudi Arabia. In addition, this study examined students' perceptions of the impact of e-learning strategies on their research writing performance through a quantitative approach. Future research could further examine these perceptions using qualitative methods to obtain explanatory data that can reflect students' perspectives and views. Finally, future studies could consider other factors that may influence students' perceptions, such as socioeconomic class and gender segregation. For gender segregation, most Saudi universities are separated by gender, including SEU. Thus, future research can investigate whether this gender digital divide has any impact on students' perception or not.

REFERENCES

- [1] Abdalmenem, S. A., Arqawi, S. M., Abu Amuna, Y. M., Abu Naser, S. S., & Al Shobaki, M. J. (2019). E-Learning strategies in developing research performance efficiency: Higher education institutions. *International Journal of Academic Pedagogical Research (IJAPR)*, 3(9), 8-19.
- [2] AbuSeileek, A. F. (2006). The use of word processor for teaching writing to EFL learners in King Saud University. *Journal of King Saud University*, 19(2), 1-15.
- [3] Algahtan, A. (2011). *Evaluating the effectiveness of the e-learning experience in some universities in Saudi Arabia from male students perceptions* [Doctoral dissertation]. <http://etheses.dur.ac.uk/3215/>
- [4] Alhawiti, N. M. (2023). The influence of active learning on the development of learner capabilities in the college of applied medical sciences: Mixed-methods study. *Advances in Medical Education and Practice*, 14, 87-99. <https://doi.org/10.2147/amep.s392875>
- [5] Alhumsi, M. H., Alshaye, R. A., & Sendi, K. K. (2021). The effect of e-learning sessions on the development of reading comprehension: A case of EFL students' perceptions at Saudi Electronic University. *Journal of Education and e-Learning Research*, 8(4), 431-439. <https://doi.org/10.20448/journal.509.2021.84.431.439>
- [6] Aljaber, A. (2018). E-learning policy in Saudi Arabia: Challenges and successes. *Research in Comparative and International Education*, 13(1), 176-194. <https://doi.org/10.1177/1745499918764147>
- [7] Alkubaidi, M. (2019). An action research on EFL writing dilemmas: A case of Saudi students and instructors. *Arab World English Journal (AWEJ)*, 10(3), 151-164. <https://doi.org/10.24093/awej/vol10no3.10>
- [8] AlMarwani, M. (2020). Academic writing: Challenges and potential solutions. *Arab World English Journal (AWEJ) Special Issue on CALL*, (6), 114-121. <https://doi.org/10.24093/awej/call6.8>
- [9] Almelhi, A. (2021). The role of the blackboard LMS in EFL course delivery during the COVID-19 pandemic: Investigating attitudes and perceptions of faculty and students. *International Journal of English Linguistics*, 11(2), 46-67. <https://doi.org/10.5539/ijel.v11n2p46>
- [10] Alqahtani, A. Y., & Rajkhan, A. A. (2020). E-learning critical success factors during the COVID-19 pandemic: A comprehensive analysis of E-learning managerial perspectives. *Education Sciences*, 10(9), Article 216. <https://doi.org/10.3390/educsci10090216>

- [11] Al-qdah, M., Alanezi, S., Alyami, E., & Ababneh, I. (2025). Gender differences in e-learning tool usage among university faculty members in Saudi Arabia post-COVID-19. *COVID*, 5(5), Article 71. <https://doi.org/10.3390/covid5050071>
- [12] Alsaedi, N., & Alhumsi, M. (2024). Saudi undergraduate students' perceptions of plagiarism: A case of EFL research writing tasks during e-learning sessions. *Heliyon*, 10(22), Article e39804. <https://doi.org/10.1016/j.heliyon.2024.e39804>
- [13] Amastini, F., Sekarhati, D. K. S., & Puspitasari, M. (2025). Advancing adaptive and personalized e-learning systems: A systematic literature review. *Advance Sustainable Science, Engineering and Technology*, 7(2), Article 0250209. <https://doi.org/10.26877/m82zg802>
- [14] Anas, A. (2020). Perceptions of Saudi students to blended learning environments at the University of Bisha, Saudi Arabia. *Arab World English Journal (AWEJ) Special Issue on CALL*, 6(6), 261-277. <https://dx.doi.org/10.24093/awej/call6.17>
- [15] Bakhou, B., & Bouhania, B. (2020). A qualitative inquiry into the difficulties experienced by Algerian EFL master students in thesis writing: 'Language is not the only problem'. *Arab World English Journal (AWEJ)*, 11(2), 243-257. <https://doi.org/10.24093/awej/call6.17>
- [16] Belvin, E., & Mamnzenou, A. (2025). Provision and utilization of e-learning facilities for effective teaching-learning outcome in universities in Rivers State, Nigeria. *Scientific Journal of Educational Research and Law (SJERAL)*, 3(1), 84-92.
- [17] Braguglia, K. H., & Jackson, K. A. (2012). Teaching research methodology using a project-based three course sequence critical reflections on practice. *American Journal of Business Education (AJBE)*, 5(3), 347-352. <https://doi.org/10.19030/ajbe.v5i3.7007>
- [18] Capdeferro, N., & Romero, M. (2012). Are online learners frustrated with collaborative learning experiences? *The International Review of Research in Open and Distributed Learning*, 13(2), 26-44. <https://doi.org/10.19173/irrodl.v13i2.1127>
- [19] Chakma, U., Li, B., & Kabuhung, G. (2021). Creating online metacognitive spaces: Graduate research writing during the COVID-19 pandemic. *Issues in Educational Research*, 31(1), 37-55.
- [20] Creswell, J. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson.
- [21] Ebrahim, B. (2024). Using digital tools to enhance EFL writing skills of primary stage pupils and their motivation towards writing. *Journal of The Faculty of Education- Mansoura University*, 127(4), 21-49. <https://doi.org/10.21608/maed.2024.409523>
- [22] Encarnacion, R. E., Galang, A. D., & Hallar, B. A. (2021). The impact and effectiveness of e-learning on teaching and learning. *International Journal of Computing Sciences Research*, 5(1), 383-397. <https://doi.org/10.25147/ijcsr.2017.001.1.47>
- [23] Erlinda, R., Darmayenti, & Dewi, M. P. (2022). Undergraduate students' difficulties in mastering research methodology course in Islamic higher education. *Journal of Education Research and Evaluation*, 6(4), 739-747. <https://doi.org/10.23887/jere.v6i4.48414>
- [24] Eviyanti, E., Zulherman, Z., & Polili, A. (2020). Google Classroom in blended learning on teaching research method. In *Proceedings of the International Conference Community Research and Service Engagements (IC2RSE)*. <https://doi.org/10.4108/eai.4-12-2019.2293797>
- [25] Garrison, D. R. (2011). *E-learning in the 21st century: A framework for research and practice*. Taylor & Francis.
- [26] Guo, H., & Li, D. (2024). The effect of electronic portfolio-based writing instruction on the second language writing performance and writing self-efficacy of EFL learners: A mixed methods study. *SAGE Open*, 14(2), Article 21582440241257697. <https://doi.org/10.1177/21582440241257697>
- [27] Gupta, S., Jaiswal, A., Paramasivam, A., & Kotecha, J. (2022). Academic writing challenges and supports: Perspectives of international doctoral students and their supervisors. *Frontiers in Education*, 7, Article 891534. <https://doi.org/10.3389/educ.2022.891534>
- [28] Hoon, T. S., & Singh, P. (2019). A practice in a research methodology class. *Asian Journal of University Education*, 15(3), 45-53. <https://doi.org/10.24191/ajue.v15i3.7820>
- [29] Ilie, V., & Ștefan, M. A. (2022). Modern training strategies used in e-learning. *Analele Universității din Craiova. Seria Psihologie-Pedagogie/Annals of the University of Craiova. Series Psychology-Pedagogy*, 44(2), 227-243. <https://doi.org/10.52846/aucpp.2022.2.19>
- [30] Kamarudin, L. M., Sinal, M. S., Tantowi, N. A., & Yusof, Y. M. (2024). Adoption of dotstorming to enhance practicum report writing among event management students. *Asia-Pacific Journal of Innovation in Hospitality & Tourism*, 13(3), 113-130.
- [31] Klačnja-Miličević, A., Vesin, B., Ivanović, M., Budimac, Z., & Jain, L. C. (2016). *E-learning systems: Intelligent techniques for personalization*. Springer.
- [32] Kumar Basak, S., Wotto, M., & Bélanger, P. (2018). E-learning, m-learning and d-learning: Conceptual definition and comparative analysis. *E-Learning and Digital Media*, 15(4), 191-216. <https://doi.org/10.1177/2042753018785180>
- [33] Listyani. (2021). Indonesian freshmen's challenges in collaborative learning during COVID-19 Pandemic: A reflection of a procedural writing class. *Arab World English Journal (AWEJ)*, 12(3), 307-331. <https://doi.org/10.31235/osf.io/etpgx>
- [34] Morin, D., Fard, H., & Saadé, R. (2019). Understanding online learning based on different age categories. *Issues in Informing Science and Information Technology*, 16(1), 307-317. <https://doi.org/10.28945/4313>
- [35] Motjolopane, I. (2021). Teaching research methodology: Student-centered approach computing education undergraduate course. *Emerging Science Journal*, 5(1), 34-43. <https://doi.org/10.28991/esj-2021-01255>
- [36] Mutambik, I. (2018). The role of e-learning in studying English as a foreign language in Saudi Arabia: Students' and teachers' perspectives. *English Language Teaching*, 11(5), 74-83. <https://doi.org/10.5539/elt.v11n5p74>
- [37] Naveed, Q. N., Muhammed, A., Sanober, S., Qureshi, M. R., & Shah, A. (2017). Barriers effecting successful implementation of e-learning in Saudi Arabian universities. *International Journal of Emerging Technologies in Learning (IJET)*, 12(06), 94-107. <https://doi.org/10.3991/ijet.v12i06.7003>
- [38] Olivier, J. (2014). A blended learning approach to teaching sociolinguistic research methods. *Per Linguam*, 30(2), 51-68. <https://doi.org/10.5785/30-2-543>
- [39] Pateşan, M., Balagiu, A., & Alibec, C. (2018, June). Visual aids in language education. In *International Conference on Knowledge-Based Organization*, 24(2), 356-361. <https://doi.org/10.1515/kbo-2018-0115>
- [40] Pikhart, M., & Klímová, B. (2020). E-learning 4.0 as a sustainability strategy for Generation Z language learners: Applied linguistics of second language acquisition in younger adults. *Societies*, 10(2), Article 38. <https://doi.org/10.3390/soc10020038>

- [41] Qasem, F. A., & Zayid, E. I. (2019). The challenges and problems faced by students in the early stage of writing research projects in L2, University of Bisha, Saudi Arabia. *European Journal of Special Education Research*, 4(1), 32-47. <https://doi.org/10.5281/zenodo.2557036>
- [42] Ramli, K., Assaiqeli, A., Mostafa, N. A., & Singh, C. K. (2022). Gender perceptions of benefits and challenges of online learning in Malaysian ESL classroom during COVID-19. *Studies in English Language and Education*, 9(2), 613-631. <https://doi.org/10.24815/siele.v9i2.21067>
- [43] Sendi, K. K., & Alhumsi, M. H. (2023). Teaching research methodology to undergraduate students using collaborative learning approach in a blended learning environment at Saudi Electronic University. *World Journal of English Language*, 13(7), 171-185. <https://doi.org/10.5430/wjel.v13n7p171>
- [44] Setiawan, D., & Sembiring, B. (2023). Research methodology course for undergraduate students in Indonesian tertiary education. *International Journal of Social Science and Human Research*, 6(4), 2012-2018. <https://doi.org/10.47191/ijsshr/v6-i4-03>
- [45] Shahsavar, Z., & Kourepaz, H. (2020). Postgraduate students' difficulties in writing their theses literature review. *Cogent Education*, 7(1), Article 1784620. <https://doi.org/10.1080/2331186x.2020.1784620>
- [46] Tsai, M. J. (2009). The model of strategic e-learning: Understanding and evaluating student e-learning from metacognitive perspectives. *Journal of Educational Technology & Society*, 12(1), 34-48.
- [47] Valverde-Berrocoso, J., Garrido-Arroyo, M. D., Burgos-Videla, C., & Morales-Cevallos, M. B. (2020). Trends in educational research about e-learning: A systematic literature review (2009–2018). *Sustainability*, 12(12), Article 5153. <https://doi.org/10.3390/su12125153>
- [48] Wu, E., & Patel, S. (2016). Teaching mixed methods research through blended learning: Implications from a case in Hong Kong. *Journal of Educational Enquiry*, 15(1), 15-25.

Kholod Sendi holds a PhD in Educational Linguistics from the University of New Mexico in the United States. She is an assistant professor in the College of Sciences and Theoretical Studies at Saudi Electronic University (SEU). Moreover, she teaches multiple courses to undergraduate students in the Department of English Language and Translation. Her research interests include English language teaching and learning in Saudi Arabia, academic and research writing, language and gender, university teaching, e-learning, and instructional design. ORCID iD: <https://orcid.org/0000-0003-0994-9565>; Email: kha.sendi@seu.edu.sa

Najah Alsaedi is an Assistant Professor of Applied Linguistics in the Department of English and Translation at Saudi Electronic University, Saudi Arabia. Her research interests include ESL/EFL teaching and learning, discourse analysis, e-learning, and the integration of artificial intelligence in language instruction. ORCID iD: <https://orcid.org/0009-0004-9836-0879>; Email: a.najah@seu.edu.sa