The Impact of Online Learning on the Sustainable Development of Saudi EFL Students' Self-Efficacy and Willingness to Communicate

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Abstract

Drawing on Bandura's (1986) social cognitive theory (SCT), this study explores how online learning in Saudi higher education institutions effectively contributes to sustainable development, particularly to quality education. More specifically, this study is basically grounded on the postulation that online learning promotes sustainable academic development for Saudi EFL (English as a Foreign Language) students in terms of two learning constructs: self-efficacy (SE) and willingness to communicate (WTC). The main objectives of the study are (i) demonstrating how online learning contributes to the sustainable development of Saudi EFL students' self-efficacy and willingness to communicate and (ii) shedding light on the possibility of depending totally on a computerized type of learning that functions to reinforce much better sustainable learning outcomes. For collecting data and obtaining results, the study uses a mixed-method methodology represented by both quantitative and qualitative methods and manifested in a questionnaire and an interview. The study's participants are 158 EFL students and 10 EFL teachers who are affiliated with a Saudi university. Results reveal a strong correlation between online learning and self-efficacy and willingness to communicate, which indicates that online learning effectively contributes to the sustainable development of Saudi EFL students in terms of the two learning constructs. This, in turn, improves students' academic performance and further contributes to better learning outcomes. The study recommends further applications of technology-mediated learning and practical strategies to create a sustainable online learning environment and enhance students' academic performance in the Saudi EFL context.

Keywords: online learning, Saudi EFL context, sustainable development, self-efficacy, willingness to communicate, social cognitive theory

1. Introduction

Technology's quick development has transformed almost every field of society, including education. The use of numerical apparatuses, platforms, and means to support teaching and learning is known as technology-mediated education (An et al., 2022). Technology has made it possible for a model in the way knowledge is shared, from interactive digital platforms to online courses. The potential for this change to promote sustainability is among its most important advantages. Technology integration in education presents chances to lower resource consumption, encourage eco-friendly behaviors, and cultivate a more sustainable approach to learning and growth as environmental issues become more pressing (Xiao & Pan, 2022). As evidenced by Vision 2030, Saudi Arabia commitment to sustainable development is dedicated to fostering economic diversification and sustainable growth (Aljaradin et al., 2024). Given the intimate connection between EFL instruction and the various institutional entities, it is argued that proficient EFL students could significantly support Saudi Arabia's attempts to address the problems posed by sustainability and globalization. This can be conducted by recognizing effective communication strategies, understanding cultural peculiarities, and motivating sustainability projects that address the demands of a globalized society. This assertion is supported by the understanding that EFL is essential in the connected world of today and that sustainability efforts are intimately related to the ability to handle the problems brought up by globalization (Zhao et al., 2022).

Over the last few years, online learning has become the most sought-after mode of education globally, including in Saudi Arabia. In Saudi Arabia, educational institutions have offered online learning courses in universities, particularly to female students who are taught by male teachers and in sections that abound in both genders. In these cases, online learning, mainly through blackboard collaborate, is obligatory. Blackboard collaborate provides students with an online virtual classroom that facilitates interactive learning in real time through the use of video/audio, shared whiteboards, content sharing of files and applications, breakout rooms for group work, chat, and polling. This allows for live participation (synchronous) and recorded participation (asynchronous), and all of which develop a sense of connectedness in learning (Khafaga & Alghawli, 2021). While online learning has provided access and convenience, it has also helped challenge a number of essential questions about its capacity to develop required competences for EFL learners. Two such learning constructs are self-efficacy which, according to Bandura (1977), refers to the perceived ability to learn or accomplish tasks, and willingness to communicate (WTC), which is essential for learning a language and applying it in the real world. In the case of Saudi EFL learners, it is necessary to understand how virtual learning environments influence such communicative and psychological factors to balance language learning with the broader agenda of sustainable development, for example, quality education (SDG 4). However, previous research has not adequately explored the intersection of online learning, self-efficacy, and WTC in an integrated model of

sustainability, especially in non-Western, EFL-major settings such as Saudi Arabia. Therefore, it is important to investigate how online learning affects the self-efficacy of Saudi EFL learners and their willingness to communicate in English and whether such impacts promote or hinder sustainable education development.

Self-efficacy and willingness to communicate (WTC) are two of the most crucial psychological learning constructs that significantly influence language proficiency when learning a foreign language, particularly in EFL settings. According to Bandura (1997), self-efficacy is the conviction that one can accomplish particular tasks and reach objectives. Self-efficacy has an impact on second language learners' drive, perseverance, and fortitude in the face of communication difficulties. Increased initiative in language activities, risk-taking, and the use of successful learning strategies are all encouraged by students' stronger self-efficacy (Zhang & Ardasheva, 2019). According to MacIntyre et al. (1998), willingness to communicate is the likelihood that someone chooses to start speaking a second language when given the opportunity. It is influenced by both situational and stable factors, such as motivation, self-confidence, language proficiency, and perceived communication competence. Crucially, students who believe they can communicate will typically make and maintain contact in the target language, making self-efficacy a major predictor of WTC (Yashima, 2002). The connection between self-efficacy and WTC is even more essential in EFL contexts, as is the case for Saudi Arabia, where contacts providing actual language use may be scarce. Learners' ability to communicate can be hindered or improved by cultural norms, learning styles, and anxiety. In order to build pedagogical interventions that can improve learners' communicative competence and support long-term language development in a sustainable and contextually responsive manner, it is imperative that both conceptions be understood and encouraged.

The significance of the current study lies in the fact that its primary goals align with the Saudi 2030 Vision, which emphasizes the technological link between sustainability and education. Its significance, therefore, is twofold: first, it highlights how online education contributes to creating and maintaining a sustainable environment; second, it demonstrates how much Saudi Arabia's 2030 Vision acknowledges the technological component of the SDGs. Furthermore, Saudi Arabia has implemented a variety of policies and initiatives to assist in achieving the 17 Sustainable Development Goals. Saudi Vision 2030 places a strong emphasis on improving curricula, promoting higher education, and developing labor-market capabilities and also seeks to improve educational indicators to achieve better learning outcomes.

1.1 Research Objectives

The current study attempts to achieve the following research objectives:

1. To demonstrate how online learning contributes to the sustainable development of Saudi EFL students' self-efficacy.

2. To show how online learning contributes to the sustainable development of Saudi EFL willingness to communicate.

1.2 Research Questions

The study seeks to answer the following research questions:

1. How does online learning contribute to the sustainable development of Saudi EFL students' self-efficacy?

2. How does online learning contribute to the sustainable development of Saudi EFL students' willingness to communicate?

The remainder of this paper is structured as follows: Section 2 provides the theoretical preliminaries and the literature review of the study, as well as some previous and related studies pertinent to the current study. Section 3 presents the theoretical framework of the study by providing a discussion on the social cognitive theory and the concepts of self-efficacy and willingness to communicate. Section 4 is the methodology, in which the paper demonstrates its data collection procedures, data description, the study's sample and participants, and the analytical procedures followed in the study. Section 5 offers the results of the study. Section 6 discusses the results obtained from the analysis of the selected data. Section 7 is the conclusion of the study, which ends with some pedagogical implications, the limitations of the study, and some recommendations for further research.

2. Theoretical Preliminaries and Literature Review

2.1 Sustainability

Sustainability, which includes social justice, economic viability, and environmental integrity, is the ability to meet present-day demands without endangering the ability of future generations to meet their own (World Commission on Environment and Development, 1987). Sustainability has developed throughout time into a multifaceted idea that encompasses topics like gender equality, poverty reduction, inclusive education, and responsible consumption in addition to environmental concerns (Sachs, 2015). The United Nations' 2030 Agenda for Sustainable Development highlights the interdependence of environmental, social, and economic systems through its 17 SDGs (United Nations, 2015). Long-term planning, systems-based problem solutions, and cooperation across fields, industries, and communities are all necessary for a sustainable strategy (Sterling, 2011). Education plays a crucial part in promoting sustainability by giving students the information, values, and abilities they need to confront global issues and behave as responsible, educated citizens. Crucially, sustainability is a dynamic process of adaptation and ongoing development driven by moral principles and a dedication to justice and equity rather than a static condition. In a time of resource depletion, socioeconomic disparity, and climate change, sustainability offers a crucial paradigm for reconsidering how societies operate and how people interact with the environment and with one another (Oraif, 2024).

2.2 Sustainability in the Saudi EFL Context

The idea of sustainability in education has gained traction in Saudi Arabia, particularly in the context of the country's Vision 2030 project, which highlights the importance of high-quality education in promoting socioeconomic development. Since English competence is becoming more and more associated with academic success, professional mobility, and global competitiveness, English as a foreign language is viewed as a crucial part of this goal (Alshammri, 2023). More than just raising awareness of environmental issues, integrating sustainability into the Saudi EFL curriculum means giving students the language and intercultural skills they need to participate in international discourse and make significant contributions to the Sustainable Development Goals (SDGs). In light of Saudi Arabia's transition to a knowledge-based, diverse economy, sustainable EFL instruction needs to be open, affordable, and consistent with the ideas of lifelong learning. In order to ensure a sustainable educational framework, the Ministry of Education has taken measures toward curriculum reform, teacher professional development, and the integration of digital resources to assist language instruction (Alhazmi, 2019). Sustainability also calls for a balance between technological innovation and human-centered teaching practices that foster engagement, collaboration, and real-world communication. As Saudi Arabia continues to reform its education system under Vision 2030, embedding sustainability into EFL practices through culturally sensitive curricula, equitable access, and digital innovation will be vital for preparing students to participate in a rapidly changing, interconnected world.

2.3 Online Learning as a Sustainability Supporter

Online learning refers to the use of digital platforms, such as blackboard collaborate, in the process of teaching and learning. It provides scalable, adaptable, and resource-efficient alternatives to traditional classroom instruction, as it becomes a potent enabler of sustainability in education. Online learning offers a practical way to lessen environmental impact, increase access to education, and encourage lifelong learning as global priorities shift toward accomplishing the Sustainable Development Goals (SDGs) of the UN, especially SDG 4 (quality education) (United Nations, 2015). Online education greatly reduces the carbon footprint associated with educational delivery by eliminating the need for physical infrastructure, printed materials, and travel, hence promoting environmental sustainability (Mulà et al., 2017). Additionally, by increasing educational opportunities for economically disadvantaged, disenfranchised, or physically isolated communities, it promotes social sustainability through greater inclusion and equity (Adedoyin & Soykan, 2020). Apart from the practical advantages, online learning environments frequently foster the growth of digital literacy, self-directed learning, and teamwork, skills necessary for navigating and advancing sustainable societies (Khafaga & Al-Johani, 2024). According to An et al. (2022), online learning must be created with equity in mind, guaranteeing that all students have access to the devices, connectivity, and support systems they require in order to reach its full sustainable potential. Online learning, when used carefully and inclusively, not only improves learning outcomes but also directly relates to more general sustainability goals, highlighting the transformative power of education in tackling global issues.

Furthermore, when online learning is planned well, it can foster cross-cultural communication, digital literacy, and global citizenship, all essential skills for sustainability in an increasingly interconnected world (An et al., 2022). Online learning has potential, but there are sustainability issues that need to be resolved to maintain its long-term viability and equity. Instead of lessening already-existing disparities, digital divides, such as unequal access to devices, internet connectivity, and technology literacy, can exacerbate them (Castañeda & Selwyn, 2018). Also, when assessing the sustainability of online learning, it is important to include the environmental impact of digital infrastructure, such as energy-intensive data centers and electronic trash (An et al., 2022). To cultivate meaningful participation, teamwork, and critical thinking, all of which are necessary for fostering a sustainability-oriented mindset, online learning should pedagogically go beyond the simple transmission of knowledge. Consequently, teachers should embrace inclusive strategies that close access gaps, advance digital equity, and guarantee that students are not just absorbing knowledge but also gaining the skills necessary for active engagement in sustainable development if they are to fully realize the promise of online learning as a sustainable educational model.

2.4 Previous and Related Studies

Numerous previous studies in the Saudi EFL context have increasingly examined how online or virtual learning influences learners' self-efficacy, willingness to communicate (WTC), and related affective or engagement variables, though only a few studies integrate all three constructs directly. One central study by Khafaga and Al-Johani (2024) employed a mixed-methods design to investigate the impact of virtual learning (VL) on students' engagement among 256 EFL majors at Prince Sattam bin Abdulaziz University. Their results showed that VL had a positive effect on learning self-efficacy and willingness to communicate. The study, thus, provides empirical support for VL's role in promoting both self-efficacy and WTC in Saudi EFL settings. Other studies focus more narrowly; for example, Alamri (2021) surveyed 1,167 undergraduate students at Jeddah University and found that students' attitudes toward online learning were high and significantly correlated with academic self-efficacy, indicating that positive online learning experiences can strengthen learners' beliefs in their academic capability. Alqarni (2023) also investigated online versus face-to-face learning among 106 Saudi undergraduates and found that WTC was higher in online settings than in traditional learning environments.

Another relevant study by Aldhahi et al. (2021) examined self-efficacy in learning, time management, and technology among 892 university students across many Saudi universities during the COVID-19 emergency transition. They found that many students reported insufficient self-efficacy in learning and time-management domains, though technology self-efficacy was relatively stronger, and that self-efficacy predicted satisfaction with e-learning. A further study by Alkhalifah (2023) explored how self-efficacy, learning preferences,

and learning motivation interact to influence academic achievement among Saudi EFL students. Alkhalifah's study also showed that self-efficacy and motivation had direct positive effects on achievement, and that preference for e-learning moderated those effects. Furthermore, in studies of extramural digital contexts, Alshammri (2023) interviewed 50 secondary-school Saudi EFL learners about their willingness to communicate in digital informal settings. Alshammri's findings indicated that self-confidence (an element closely related to self-efficacy), anxiety, familiarity with partners and online communities, and pedagogical variables affected WTC in digital environments. These studies suggest that virtual/online learning has considerable potential to boost self-efficacy, reduce anxiety, and enhance WTC among Saudi EFL learners, especially when the learning environment is well designed, supportive, and includes digital/distance modalities.

However, there are clear gaps. Very few studies explicitly integrate all three of self-efficacy, willingness to communicate, and a sustainability framework. Longitudinal studies are scarce, so we know little about whether the effects of online learning on self-efficacy and WTC are sustained over time. The design features of online learning (feedback, interaction, peer engagement, scaffolding) are often under-specified, making it difficult to isolate which aspects drive gains in self-efficacy and WTC. Finally, although sustainable development is referred to in national policies like Vision 2030, few empirical studies explicitly connect learners' psychological outcomes (self-efficacy, WTC) with sustainable educational or socio-economic development indicators.

3. Theoretical Framework

3.1 Social Cognitive Theory

Albert Bandura (1986) developed the social cognitive theory to place a strong emphasis on cognitive, vicarious, self-regulatory, and self-reflective processes as key components of human adaptation and change. According to this social cognitive paradigm, human behavior and thought are the result of a dynamic interaction between environmental, behavioral, and personal factors. People's surroundings and personal characteristics are influenced and changed by how they interpret the outcomes of their own actions, which, in turn, influences and changes following actions. Bandura's concept of reciprocal determinism is based on the idea that (1) personal elements, such as cognition, affect, and biological events; (2) behaviors; and (3) environmental effects produce interactions that lead to a triadic reciprocity (Bandura, 2009).

According to the social cognitive theory, the determinants of human functioning are reciprocal, which allows for the targeting of behavioral, environmental, or personal aspects in therapy and counseling (Bandura, 1989). In light of the social cognitive theory, there are some approaches that function to boost individuals' well-being. These include enhancing behavioral competences, strengthening emotional, cognitive, or motivational processes, or changing the social context in which people live and work. To clarify, teachers in educational institutions have the task of enhancing their students' confidence and academic performance. This can be conducted by employing the framework of social cognitive theory. Educators can try to improve their students' emotional states, correct their flawed self-perceptions and thought patterns (personal factors), enhance their academic abilities and self-control (behaviors), and change classroom structures that might be impeding their success (environmental factors). The main concern of the social cognitive theory is that people actively participate in their own growth and have the power to influence events through their behavior. For Bandura (1997), people are endowed with specific abilities that characterize what it is to be human. These include the ability to self-reflect, self-regulate, learn through vicarious experience, plan alternate solutions, and symbolize. But according to Bandura, self-reflection is the most distinctively human ability, which is why it is a key component of social cognitive theory. People use self-reflection to make sense of their experiences, their own thoughts and beliefs, assess themselves, and change the way they think and act (Bandura, 1977, 2009).

3.2 Self-efficacy

The most significant concept in social cognitive theory is that of self-efficacy, which Bandura (1997) defines as the perception that one can plan and execute the courses of action necessary to achieve some given situation. Such a belief system is extremely influential in how people behave since it guides their choices, efforts, persistence, emotional responses, and rehabilitation from failure. While low-self-efficacy individuals will sidestep demanding tasks, quit easily, and experience higher anxiety or despair, high-self-efficacy individuals will tend to establish demanding goals, work hard at them, and bounce back promptly from failures (Pajares, 2002). Self-efficacy is essential for classroom academic motivation, achievement, and self-regulated learning. Students will be more inclined to participate in class, use effective learning strategies, and persevere in the face of challenge if they have confidence in their ability to achieve (Schunk & DiBenedetto, 2020). The four broad influences on self-efficacy, varying by domain, include mastery experiences (successes and failures), vicarious experiences (experiential learning through observing others), social persuasion (feedback and encouragement), and physiological/emotional states (arousal and mood) (Bandura, 1997). Self-efficacy affects the willingness of language learners to engage in class, interact with others, and try out using the language, steps to unlocking communicative competence. In order to promote self-efficacy among students, it is thus not so much to provide a self-confidence injection; it is also to create conditions for empowering students to do important things, be given constructive feedback, and believe that they are able contributors to their own learning.

3.3 Willingness to Communicate

Another learning construct and key concept in second language learning is willingness to communicate (WTC), which indicates a learner's readiness to start a conversation in the target language with a particular person at a specific time, independent of their level of ability (MacIntyre et al., 1998). WTC is a situational and psychological characteristic that has attracted attention due to its direct impact on communicative success and language use. As such, it is a crucial predictor of students' classroom engagement and language proficiency.

WTC places more emphasis on learners' intention to use the language in real-time contexts and on actual communicative behavior than previous perspectives that prioritized linguistic ability as the main objective of language teaching (Dörnyei, 2005). Self-confidence, motivation, anxiety, perceived communicative competence, and the immediate social context are some of the complex interplaying aspects that affect it (Yashima, 2002). High WTC students will be more likely to practice speaking, ask questions, and interact with peers and teachers within the class, giving them greater exposure to input and practice for language acquisition. Enhancing WTC is also of very high value in EFL settings, where learners should be encouraged to initiate communicative activity and exposure to authentic use of language may prove inadequate. Significantly, teachers can maximize WTC by fostering positive peer relations, building supportive, low-anxiety learning environments, and increasing communicative confidence and self-efficacy among students. WTC is then a dynamic and trainable notion that is critical to successful language learning and communicative competence and not just the result of learning (MacIntyre et al., 1998).

4. Methodology

4.1 Design of the Study

This study employs a mixed-methods research approach, combining both qualitative and quantitative research methods (Creswell & Clark, 2011; Guetterman et al., 2019) to gain depth of understanding about the impact of online learning on Saudi EFL learners' self-efficacy and willingness to communicate. Quantitative aspects involve completing a standardized questionnaire comprising two parts: 20 Likert-scale statements that address students' self-efficacy under circumstances of learning English online, and 20 statements that ask them to explore their WTC across various virtual and digital communication situations. Quantitative aspects of the research aim to yield numerical data that can be statistically inferred in a bid to identify patterns, correlations, and predictors. Along with this, the qualitative component consists of semi-structured interviews of a sample of participants that will be using a 7-question open-ended interview with questions to probe EFL teachers' perceptions, personal experience, and attitudes towards online learning and how these influence their students' confidence and communication behavior. With a combination of these two forms of data, the study has maintained methodological triangulation, allowing findings to be confirmed and investigated more deeply. This parallel convergent design enables an integrated exploration of the research problem by paying attention to both the global trends and the personal phenomena of sustainable language learning in a digitally mediated environment.

4.2 Instruments of the Study

Two quantitative instruments and a single qualitative instrument were employed to collect data for this study. The first was a self-efficacy scale that consisted of 20 statements on a 5-point Likert scale. These statements assessed students' confidence in managing various language learning tasks, such as speaking, listening, participation in class, assignments, and the use of English in online settings. This part of the students' questionnaire deals with four variables, testing students' attitudes of the impact of online learning on their self-efficacy. These variables include online learning experience, self-efficacy in language skills, sustainable learning practices, and overall self-efficacy and sustainable development. The second quantitative instrument was a willingness to communicate (WTC) survey, which constitutes another 20 items with a 5-point Likert scale questionnaire, assessing learners' readiness to initiate communication in English in various contexts, including online discussions, breakout rooms, written conversations, and virtual communication. This part also presents four variables to assess students' attitudes about the impact of online learning on their willingness to communicate. These variables include the online learning environment, communication opportunities, motivation and confidence, and sustainable development of WTC. Crucially, the two instruments provided a clear representation of students' self-concepts and communicative willingness in the context of online EFL learning. To supplement the quantitative data and explore deeper psychological and contextual factors influencing self-efficacy and WTC, a semi-structured interview was also conducted with a sample of participants. The interview had 7 open-ended questions with the purpose of tapping students' own experiences with online learning, perceived enablers and barriers to English communication, changes in their self-confidence, and their opinions about how online learning facilitates their long-term language development. This triangulated structure allowed breadth and depth in understanding the impact of online learning on these two learning constructs within a sustainable development framework.

4.3 Sampling

The study sample is made up of two distinct groups of participants from Prince Sattam bin Abdulaziz University in Saudi Arabia. The first group consists of 158 Saudi EFL students, males and females, who are currently studying at the university's English language program. The sample of the students is a mix of various academic levels, ranging from level five to level eight. Responded participants from lower academic levels (from level one to level four) are excluded. Such a selection of higher academic levels is intentionally done for four reasons: first, to guarantee that participants nearly share the same number of online courses during the same semester; second, the students in these higher levels have been taught higher- level specialized courses; third, these students are anticipated to share similar cognitive abilities; and, fourth, such diversity of academic levels further serves to allow the potential for a variety of experiences and perspectives concerning self-efficacy and willingness to communicate in virtual learning environments. The second group consists of 10 EFL teachers of the same university selected through purposive sampling based on their previous experience of teaching English online. These teachers agreed to take part in semi-structured interviews that aimed at gathering professional data regarding the learning habits, problems, and accomplishments of students with regard to self-efficacy and willingness to communicate when learning online. Together, these two cohorts present an evenly balanced dataset from which to explore the impact of online learning on the sustainable development of Saudi EFL students' self-efficacy

and willingness to communicate from a student and teacher perspective.

Before they could access the survey, potential participants had to fill out an informed consent form indicating their willingness to participate in the study and their consent to the use of their data for research. The data for this study were collected over the course of two academic semesters in 2024. The Google Forms platform was used to produce the survey, which was distributed in English to participants via WhatsApp groups at the end of the second semester of 2024. To detect respondents who might not be paying close attention to the questions or who are answering consistently, negative or reverse statements were purposefully added in the Likert scale. Further, to preserve respondents' anonymity, all personally identifiable information was eliminated from the results that were made public. Prior to administering the questionnaire and performing the interviews, each participant is asked in writing if they are willing to take part in the study. Only those who consent to take part in the study are included; others are not. Moreover, every participant has been thoroughly told about the study's purpose, how their data will be used, whether there are any dangers associated with their participation, and that their anonymity is guaranteed.

4.4 Validity and Reliability

To ensure the reliability and validity of instruments used in this study, several procedures were carried out prior to data collection. Content validity was established through expert review: three well-experienced instructors of EFL and two education researchers examined the items on the questionnaire for clarity, relevance, and alignment with the learning constructs of self-efficacy and willingness to communicate (WTC) to the situation of online EFL learning. Suggestions from these experts led to minor wording and format adjustments for improving item accuracy and context appropriateness for Saudi students. Validity of the qualitative interview was enhanced by revising the open-ended questions relative to the study objectives and pretesting the interview with two teachers to ensure clarity and response depth. From a reliability perspective, the questionnaire was pilot-tested among a sample of 30 students from the same population, and Cronbach's alpha was used to measure the internal consistency of all the scales. The self-efficacy scale recorded a 0.88 coefficient alpha, and the WTC scale 0.85, both indicating high reliability. Besides, the validity of interview data was also increased through member checking, where the participants checked their transcribed responses for veracity. These procedures collectively ensured that the instruments were both statistically reliable and contextually appropriate to measure the two learning constructs under investigation (i.e., self-efficacy and WTC) within the Saudi EFL setting.

4.5 Procedures

The analytical procedures for this mixed-methods study were carried out in sequential stages to ensure a comprehensive and systematic interpretation of both quantitative and qualitative data. First, responses from the student questionnaire were collected, coded, and entered into SPSS for statistical analysis. Second, descriptive statistics (means and standard deviations) were calculated to summarize students' levels of self-efficacy and willingness to communicate (WTC) in online learning contexts. In the third stage, qualitative data from the semi-structured interviews with teachers were transcribed and analyzed thematically. This qualitative stage aimed to identify patterns, perceptions, and contextual factors influencing self-efficacy and WTC in online environments. Finally, findings from both datasets were triangulated during the interpretation stage to draw connections, validate results, and provide a detailed discussion of how online learning effectively contributes to the sustainable development of Saudi EFL learners' self-efficacy and willingness to communicate.

5. Results

This section presents the results obtained from the analysis of the data collected by the students' questionnaire and the teachers' interview. These include results pertaining to the demographic data of the participants, results pertaining to the students' questionnaire, and results pertaining to the teachers' interview.

5.1 Results Pertaining to the Demographic Data of the Participants

The results show various demographic data related to the participants of the study, as shown in Table 1.

Table 1. Demographic data of the participants

Participants	Variable	Classification	No.	%	Total
Students	gender	female	83	52.53	158
		male	75	47.46	
	age	18-20	112	70.88	
		21-24	46	29.11	
	nationality	Saudi	158	100.00	
Teachers	gender	male	6	60.00	10
		female	4	40.00	
	age	30-40	6	60.00	
		40-50	2	20.00	
		50-60	2	20.00	
	nationality	Saudi	2	20.00	
		Sudanese	2	20.00	
		Egyptian	2	20.00	
		Indian	2	20.00	
		Pakistani	1	10.00	

		Jordanian	1	10.00
rank		Professor	1	10.00
		Associate professor	2	20.00
		Assistant professor	4	40.00
		Lecturer	3	30.00
experiences		less than 5 years	2	20.00
		5-10 years	7	70.00
		Above 10 years	1	10.00

A demographic summary of the study participants, which included 10 EFL instructors from Prince Sattam bin Abdulaziz University and 158 Saudi EFL students, is shown in Table 1. The majority of the students (70.88%) were between the ages of 18 and 20, suggesting that the cohort was primarily undergraduates. The gender distribution of the students was fairly balanced, with 52.53% female and 47.46% male. Every student that took part was a Saudi national. There was greater variation in the teaching group's academic background and nationality. Despite the fact that 60% of teachers were men, the majority of them were between the ages of 30 and 40 (60%) and represented a variety of nationalities, reflecting the multicultural nature of the educational setting. With varied degrees of teaching experience, the majority of professors were either assistant professors (40%) or lecturers (30%), with 70% having five to ten years of experience. In addition to taking into account the opinions of seasoned teachers from a range of professional and cultural backgrounds, this diversified sample offers a fair and representative basis for investigating how online learning affects students' self-efficacy and WTC.

5.2 Results Pertaining to the Students' Questionnaire

5.2.1 Results Pertaining to the Students' Perception of the Impact of Online Learning on their Self-Efficacy

This part demonstrates the results pertaining to students' attitudes of the impact of online learning on their self-efficacy. It presents the results in terms of four variables, including online learning experience, self-efficacy in language skills, sustainable learning practices, and general self-efficacy and sustainable development. These are shown in Tables 2, 3, 4, and 5.

Table 2. Students' attitudes of the impact of online learning on their self-efficacy: Variable 1. Online learning experience (n=158)

	Statement	Response										M	SD
		SD		D		N		A		SA			
		N	%	N	%	N	%	N	%	N	%		
1	I find online learning platforms easy to navigate and use effectively.	7	4.43	12	7.59	3	1.89	84	53.16	52	32.91	4.03	0.88
2	Online classes provide sufficient opportunities to interact with my EFL instructors.	4	2.53	9	5.69	3	1.89	78	49.36	64	40.50	4.2	0.77
3	I can access a wide range of English learning resources through online platforms.	3	1.89	11	6.96	5	3.16	112	70.88	27	17.08	3.94	0.70
4	I don't stay motivated to learn English during online classes.	49	31.01	96	60.75	3	1.89	7	4.43	3	1.89	1.85	0.84
5	Online learning allows me to study English at my own place and time.	1	0.63	2	1.26	1	0.63	136	86.07	18	11.39	4.06	0.39

Table 2 presents mostly positive attitudes of students towards the impact of online learning on their technical simplicity self-efficacy, availability of resources, flexibility, and interaction with the instructor. The highest agreement is with sentences such as "online learning allows me to study English at my own pace and time" (M = 4.06, SD = 0.39) and "online classes provide me with sufficient opportunities to interact with my EFL instructors" (M = 4.2, SD = 0.77), indicating much confidence in online learning's independence and interactive assistance. Similarly, the statement "I find online learning platforms easy to navigate and use effectively" (M = 4.03, SD = 0.88) was similarly agreed to, reflecting technological self-efficacy. Conversely, statement 4, "I don't stay motivated to learn English during online classes," was most frequently disagreed with (M = 1.85, SD = 0.84), which implies that most students remain motivated in spite of the fact that the classes are online. The students' responses indicate a general positive attitude towards online learning as a supporter for EFL self-efficacy development.

Table 3. Students' attitudes of the impact of online learning on their self-efficacy: Variable 2. Self-efficacy in language skills (n=158)

	Statement	Response										M	SD
		SD		D		N		A		SA			
		N	%	N	%	N	%	N	%	N	%		
1	I feel confident in my ability to improve my English speaking skills through online learning.	5	3.16	9	5.69	2	1.26	106	67.08	36	22.78	4.01	0.75
2	I am not able to understand English listening materials better through online resources.	46	29.11	83	52.53	5	3.16	17	10.75	7	4.43	2.09	0.86
3	I can independently correct my English language mistakes using online feedback or resources.	3	1.89	11	6.96	3	1.89	113	71.51	28	17.72	3.96	0.70
4	I feel more capable of reading and comprehending English texts through digital tools.	6	3.79	9	5.69	3	1.89	97	61.39	43	27.21	4.03	0.80
5	I can effectively write essays and assignments in English as a result of online learning.	3	1.89	7	4.43	1	0.63	121	76.58	26	16.45	4.01	0.62

Table 2 reflects students' confidence in the impact of online learning on their self-efficacy in fundamental English language skills like speaking, listening, reading, writing, and error correction. Overall, the data is marked by high self-confidence levels, especially in productive and receptive skills. The most powerful agreement is found in the statement "I can effectively write essays and assignments in English as a result of online learning" (M = 4.01, SD = 0.62), with the next being "I feel confident in my ability to improve my English speaking skills through online learning" (M = 4.01, SD = 0.75). These results suggest that students see online learning environments support the development of written as well as spoken expression, likely due to more opportunities for asynchronous practice and feedback. In the same vein, students report high confidence in reading skill acquisition (M = 4.03) and self-correction skills for independent errors (M = 3.96), demonstrating that computer resources and tools enhance their independent learning capabilities (Khafaga & Shaalan, 2020). In contrast, the only negatively worded item, "I am not able to understand English listening materials better through online resources," was strongly disagreed with (M = 2.09), confirming that students do feel there are enhancements in listening comprehension despite the reverse mode. The high mean scores, low standard deviations, and agreement among items indicate that students perceive online learning as a reliable method for improving their English language proficiency.

Table 4. Students' attitudes of the impact of online learning on their self-efficacy: Variable 3. Sustainable learning practices (n=158)

	Statement	Response										M	SD
		SD		D		N		A		SA			
		N	%	N	%	N	%	N	%	N	%		
1	I regularly review online materials to strengthen my English skills.	12	7.59	6	3.79	9	5.69	89	56.32	42	26.58	3.91	0.93
2	Online learning has helped me develop self-discipline in my English studies.	3	1.89	11	6.96	2	1.26	108	68.35	34	21.51	4.01	0.71
3	I use technology to set long-term goals for improving my English proficiency.	12	7.59	17	10.75	1	0.63	67	42.40	61	38.60	3.94	1.05
4	I feel empowered to continue learning English even after the course ends.	15	9.49	11	6.96	14	8.86	75	47.46	43	27.21	3.76	1.02
5	Online learning does not encourage me to take responsibility for my own English learning progress.	23	14.55	117	74.05	7	4.43	9	5.69	2	1.26	2.05	0.76

Table 4 summarizes students' perceptions of how online learning promotes sustainable learning habits in English, highlighting such habits as goal-setting, self-discipline, the habit of review, and independent learning. Positive attitudes are found, as there is high agreement on the majority of the statements. For example, the statement "online learning has helped me develop self-discipline in my English studies" was highly supported (M = 4.01, SD = 0.71), suggesting that students associate online environments with greater autonomy and structured learning behavior. Likewise, "I regularly review online materials to strengthen my English skills" (M = 3.91, SD = 0.93) and "I use technology to set long-term goals for improving my English proficiency" (M = 3.94, SD = 1.05) both reflect high motivation towards long-term participation and goal-establishment, which are among the foremost indications of sustainable learning. The assertion "I feel empowered to continue learning English even after the course ends" (M = 3.76, SD = 1.02) corroborates that online learning encourages lifelong learning dispositions. In contrast, the negatively worded item "online learning does not encourage me to take responsibility for my own English learning progress" received strong disagreement (M = 2.05, SD = 0.76), again indicating that most students do feel responsible and motivated to learn independently. The general response pattern points towards online learning as a productive domain for facilitating Saudi EFL students' sustainable, self-regulated language learning habits.

Table 5. Students' attitudes of the impact of online learning on their self-efficacy: Variable 4. Overall self-efficacy and sustainable development (n=158)

	Statement	Response										M	SD
		SD		D		N		A		SA			
		N	%	N	%	N	%	N	%	N	%		
1	I do not believe I can succeed in English learning regardless of the learning environment.	32	20.25	96	60.75	4	2.53	15	9.49	11	6.96	2.22	0.82
2	I feel confident participating in English discussions during online classes.	9	5.69	13	8.22	3	1.89	123	77.84	10	6.32	3.71	0.85
3	I can overcome challenges in online English learning with effort and strategies.	3	1.89	21	13.29	3	1.89	94	59.49	37	23.41	3.89	0.83
4	My self-confidence in using English has increased through online learning.	2	1.26	11	6.96	9	5.69	127	80.37	9	5.69	3.82	0.65
5	Online learning has positively contributed to my long-term development as an English language learner.	3	1.89	7	4.43	2	1.26	89	56.32	57	36.07	4.20	0.76

Table 5 displays students' perceptions regarding their general self-efficacy and sustainable development in English learning as influenced by online learning environments. The results reveal general positive attitudes, with the most positive mean score recorded for the item "online learning has positively contributed to my long-term development as an English language learner" (M = 4.20, SD = 0.76), indicating that students view online learning as a significant component of their sustainable academic success. Furthermore, the majority of students agreed

that their self-confidence in using English has been promoted by online learning (M = 3.82, SD = 0.65) and that they can overcome difficulties in online English learning through effort and strategies (M = 3.89, SD = 0.83), reflecting a high degree of resilience and self-belief, both essential constituents of self-efficacy. Confidence in communicative competence is also evidenced in the responses to "I feel confident participating in English discussions during online classes" (M = 3.71, SD = 0.85), showing that online learning provides a psychologically safe space for communication. In contrast, the negatively worded item "I do not believe I can succeed in English learning regardless of the learning environment" was strongly rejected (M = 2.22, SD = 0.82), confirming that most students do believe they can succeed, especially with the assistance of online environments. The responses of the participants in Table 5 illustrates that online learning supports not just immediate skill acquisition but also students' long-term confidence and durable motivation for English language learning.

5.2.2 Results Pertaining to the Students' Perception of the Impact of Online Learning on their Willingness to Communicate

This section offers the results related to the students' perception of the impact of online learning on their willingness to communicate. It shows the results in terms of four variables, including online learning environment, communication opportunities, motivation and confidence, and sustainable development of WTC. These are shown in Tables 6, 7, 8, and 9.

Table 6. Students' attitudes of the impact of online learning on their willingness to communicate: Variable 1. Online learning environment (n=158)

	Statement	Response										M	SD
		SD		D		N		A		SA			
		N	%	N	%	N	%	N	%	N	%		
1	Online learning makes me feel more at ease speaking English.	2	1.26	12	7.59	0	0.00	119	75.31	25	15.82	3.97	0.66
2	I have a tendency to use English in computer-mediated classrooms as opposed to face-to-face classrooms.	3	1.89	5	3.16	7	4.43	124	78.48	19	12.02	3.96	0.60
3	I feel more constrained writing in English when using chat or forums of discussion on websites.	19	12.02	79	49.99	7	4.43	13	8.22	40	25.31	2.85	0.98
4	The web-based course reduces my anxiety of making faults in English.	5	3.16	8	5.06	3	1.89	93	58.86	49	31.01	4.09	0.76
5	Online learning lets me think longer before responding in English, boosting my will to participate.	3	1.89	14	8.86	2	1.26	118	74.68	21	13.29	3.89	0.73

Table 6 shows students' attitudes of the influence of the online learning environment on their willingness to communicate (WTC) in English. Results indicate a strong positive influence of online media on students' comfort and willingness to use English. The most agreement is seen in the item "the web-based course reduces my anxiety of making faults in English" (M = 4.09, SD = 0.76), indicating that the low-anxiety online context functions to buffer normal affective barriers like fear of error. Similarly, students agreed to the idea that online learning makes them feel more comfortable speaking English (M = 3.97, SD = 0.66) and that they have a propensity to use English in computer-mediated classrooms as opposed to face-to-face classrooms (M = 3.96, SD = 0.60), suggesting that the virtual environment encourages more frequent and confident oral participation than conventional environments. Moreover, the statement "online learning lets me think longer before responding in English, boosting my will to participate" (M = 3.89, SD = 0.73) highlights a key affordance of asynchronous or semi-synchronous communication: increased planning time, which appears to support language production and learner confidence. Conversely, the sentence "I feel more constrained writing in English when using chat or forums of discussion on websites (M = 2.85, SD = 0.98), indicating that although oral and planned communication can flourish on the internet, spontaneous written communication continues to be problematic for some students. These results confirm that online environments can actually serve as protective spaces for communicative risk-taking, especially for those students who may avoid communication in traditional classroom environments.

Table 7. Students' attitudes of the impact of online learning on their willingness to communicate: Variable 2. Communication opportunities (n=158)

	Statement	Response										M	SD
		SD		D		N		A		SA			
		N	%	N	%	N	%	N	%	N	%		
1	Online classes provide enough opportunities for me to practice speaking English.	4	2.53	12	7.59	2	1.26	103	65.18	37	23.41	3.99	0.76
2	I actively participate in English discussions during online classes.	7	4.43	21	13.29	6	3.79	69	43.67	55	34.81	3.91	0.97
3	Online group work does not encourage me to communicate more in English.	36	22.78	78	49.36	13	8.22	19	12.02	12	7,59	2.32	0.89
4	I am willing to speak English in virtual breakout rooms or small groups.	6	3.79	16	10.12	9	5.69	118	74.68	9	5.69	3.68	0.81
5	I am more likely to ask questions in English during online lessons.	3	1.89	15	9.49	2	1.26	128	81.01	10	6.32	3.80	0.72

Table 7 demonstrates the attitudes of students toward the impact of opportunities for communication within online learning environments on students' willingness to communicate (WTC) in English. There is a strong agreement in the results about the presence and good quality of opportunities to speak. The response to the statement "online classes provide enough opportunities for me to practice speaking English" got a high mean score of (M = 3.99, SD = 0.76), showing that most students believe they are sufficiently facilitated in learning oral skills through online classes. Similarly, students reported consensus with "I actively participate in English discussions during online classes" (M = 3.91, SD = 0.97) and "I am more likely to ask questions in English during online lessons" (M = 3.80, SD = 0.72), both of which reflect an increase in interactive engagement and student autonomy. The use of virtual breakout rooms or smaller groups also produced positive reactions (M = 3.68), showing that cooperative settings in online environments reduce communication apprehension and enhance participation. However, the agreement on the idea that online group work does not make students want to speak more in English was below that, with a mean of 2.32, with nearly 72% disagreeing, indicating that the majority of the students perceive group work as communicatively enriching despite the negative wording employed. Obviously, Table7 shows that online learning facilitates communication and supports the creation of environments conducive to participation, inquiry, and self-confidence in using the English language.

Table 8. Students' attitudes of the impact of online learning on their willingness to communicate: Variable 3. Motivation and confidence (n=158)

	Statement	Response											
		SD		D		N		A		SA		M	SD
		N	%	N	%	N	%	N	%	N	%		
1	Online learning has enhanced my English speaking and writing capability.	8	5.06	13	8.22	5	3.16	96	60.75	36	22.78	3.88	0.88
2	I'm prompted to write in English when adopting interactive internet resources.	7	4.43	9	5.69	4	2.53	113	71.51	25	15.82	3.89	0.80
3	I feel comfortable employing English in other internet communication situations (i.e., forums, video chats, email).	3	1.89	11	6.96	5	3.16	123	77.84	16	10.12	3.87	0.69
4	I do not mind risking when employing a novel vocabulary or grammar when writing in English in a computer-mediated context.	5	3.16	14	8.86	11	6.96	82	51.89	46	29.11	3.95	0.84
5	The increased use of online coursework has not increased my interest in writing in English beyond coursework.	31	19.62	84	53.16	6	3.79	30	18.98	7	4.43	2.35	0.86

Table 8 outlines how motivation and confidence, which are mediated by online learning, influence the willingness to communicate in English (WTC). The findings show a threatening positive trend because most students report that online learning evokes both the capacity of language and the willingness to communicate English online. The response on "online learning has improved my English speaking and writing capability" (M = 3.88, SD = 0.88) confirms that students recognize actual ability enhancement as a motivation. Similarly, high agreement with "I'm prompted to write in English when adopting interactive internet resources" (M = 3.89, SD = 0.80) and "I feel comfortable employing English in other internet communication situations" (M = 3.87, SD = 0.69) indicates that digital tools contribute to confidence and real-world application of English. There is also a trend towards linguistic risk-taking because the students believe in "I do not mind risking when employing novel vocabulary or grammar when writing in English in a computer-mediated context" (M = 3.95, SD = 0.84), which indicates the cultivation of a growth mindset made possible by online environments. However, the negatively worded item that more use of online coursework has not increased students' interest in English writing above coursework (M = 2.35, SD = 0.86) was resoundingly rejected, which means that for the majority of students, online learning provokes intrinsic motivation that goes beyond coursework. Crucially, the responses demonstrate that online learning not only builds communicative competence but also strengthens students' motivation, confidence, and willingness to use English in both academic and informal digital spaces.

Table 9. Students' attitudes of the impact of online learning on their willingness to communicate: Variable 4. Sustainable development of WTC (n=158)

	Statement	Response											
		SD		D		N		A		SA		M	SD
		N	%	N	%	N	%	N	%	N	%		
1	I feel that my communication skills in English are improving steadily through online learning.	4	2.53	11	6.96	3	1.89	126	79.74	14	8.86	3.85	0.71
2	I do not plan to continue practicing my English communication online after completing my course.	27	17.08	82	51.89	7	4.43	14	8.86	28	17.72	2.58	0.92
3	Online learning has made me more open to communicating with people from different cultures in English.	9	5.69	13	8.22	7	4.43	74	46.83	55	34.81	3.97	0.95
4	I have developed long-term strategies to improve my spoken English through online resources.	11	6.96	19	12.02	13	8.22	67	42.40	48	30.37	3.77	1.01
5	I believe online learning supports my continuous development as a confident English communicator.	3	1.89	9	5.69	2	1.26	132	83.54	12	7.59	3.89	0.64

Table 9 analyzes students' attitudes towards sustainable development of their willingness to communicate (WTC) in English via e-learning. The results present a largely positive and future-looking attitude, with most of the students being both confident about enhancing communications and willing for continued development. The highest agreement was with the statement "I believe online learning supports my continuous development as a confident English communicator" (M = 3.89, SD = 0.64), reflecting near-unanimous recognition of long-term benefits of virtual platforms for communicative competence building. In the same manner, the majority agreed that their communicative competence is improving consistently (M = 3.85) and that online learning has made them more receptive to communicating with people from different cultures in English (M = 3.97), which is an essential element of global communicative competence. On the strategic learning level, "I have developed long-term strategies to improve my spoken English through online resources" also got positive ratings (M = 3.77), which indicates learners' investment in systematic, self-motivated learning habits. The only fairly mixed reaction was to the sentence "I do not plan to continue practicing my English communication online after completing my course" (M = 2.58), where more than half disagreed, indicating that a large number of students plan to continue with or even increase their English use even after official studies are over. Importantly, the table displays clearly that online learning not only raises students' immediate WTC but also encourages communicative habits and attitudes necessary for long-term development in the use of English language.

5.3 Results Pertaining to the Teachers' Interview

This part shows the results related to the interview of the teachers. Table 10 displays the perception of teachers about the impact of online learning on students' self-efficacy and willingness to communicate.

Table 10. Teachers' perception about the impact of online learning on students' self-efficacy and willingness to communicate (n= 10)

	Interview question	Responsive attitude							
		Positive		**Neutral**		**Negative**		**M**	**SD**
		No.	%	No.	%	No	%		
1	How has your students' belief in their ability to learn and use English independently (self-efficacy) been affected by online learning?	7	70.00	1	10.00	2	20.00	2.5	0.85
2	Based on your experience, how has distance learning impacted how prepared your students are to converse or participate in English during classes?	8	80.00	0	0.00	2	20.00	2.6	0.84
3	The elements of online learning (such as instruments, platforms, and adaptability) which in your opinion facilitate or impede a student's ability to learn English independently?	7	70.00	2	20.00	1	10.00	2.6	0.70
4	Are you confident that online academic settings facilitate long-term, sustainable increases in your students' self-efficacy to learn English?	7	70.00	0	0.00	3	30.00	2.4	0.96
5	Do you think that online learning methods are effective in motivating students to talk increasingly in English during online classes?	8	80.00	0	0.00	2	20.00	2.6	0.84
6	Did you note any variation in students' willingness to communicate (WTC) and self-efficacy in the e-learning context in line with their gender or skill level?	8	80.00	1	10.00	1	10.00	2.7	0.68
7	What would you recommend in terms of Saudi Arabian online teaching in EFL to promote students' self-efficacy and willingness to communicate?	7	70.00	0	0.00	3	30.00	2.4	0.96

Table 10 displays teachers' perceptions of the influence of online learning on students' WTC and self-efficacy in the Saudi EFL context. The general pattern shows a positive perception, with 70-80% of the teachers reacting positively to most of the interview questions. For instance, 80% reported that online learning has positively impacted students' willingness to participate in English discussions and their inclination to speak in online classes. In the same way, the majority (70%) believes that online tools and sites allow for independent learning and long-term self-efficacy. That being said, there is a considerable minority (20-30%) that was less sure, especially with the longevity of such gains and the need for improvement in current online EFL practice. The item on variation in WTC and self-efficacy by gender or skill level received the highest mean score (M = 2.7), indicating that teachers believe individual differences are something to be considered while teaching online. Standard deviations of the items are relatively low, indicating moderate agreement among the instructors. Significantly, the results show that while teachers largely recognize the potential of online learning for self-efficacy and WTC development, they also advocate targeted changes for these impacts to be stabilized and generalized to all learner profiles.

6. Discussion

The analysis of the obtained results shows that online learning contributes effectively to Saudi EFL students' self-efficacy and WTC. The analysis demonstrates that online learning environments promote technical, linguistic, and strategic dimensions of self-efficacy and WTC. Students felt confident about navigating the platform, accessing resources, and using tools to improve language capacity. This correlates with Bandura's (1997) social cognitive theory that underscores the contribution of mastery experience and environmental affordances to efficacy development and also reconciles with Wang and Zhan's (2020) argument that available technology enhances students' belief in their capability of performing independently. Unlike face-to-face instruction, the asynchronous nature of online learning grants students more control over rates of learning, hence confirming perceived competence (Zimmerman, 2000). The analysis also shows that increased writing and speaking self-confidence demonstrates that online learning facilitates productive language skill acquisition. Asynchronous writing tasks and synchronous speaking practice in online environments have multiple chances to rehearse, which develops self-efficacy due to repeated execution (Alfares, 2024). This contradicts earlier studies (e.g., Blake, 2009) of whether online learning might suppress oral proficiency

development due to the absence of synchronous interaction. In fact, students reported higher confidence in speaking, possibly due to reduced performance pressure in virtual environments, which is in conformity with Yanguas's (2010) argument that virtual learning environments reduce anxiety, particularly in the case of task-based videoconferencing for language acquisition.

Furthermore, the students involved in the present study identified online learning platforms as accessible, rich, and effective in enabling interaction with instructors. This goes in the opposite direction to some previous studies (e.g., Alqarni, 2023; Kim & Frick, 2011), which had a tendency to identify a lack of interaction and technology problems as limitations of virtual learning environments. Whereas earlier studies (e.g., An et al., 2022; Zheng et al., 2021) referred to challenges in the usability of platforms and limited synchronous interaction, students in this study did not appear to be hindered by similar challenges. Rather than feeling disconnected or alone, common in past distance learning research, students here recounted experiencing a sense of control and drive, particularly the convenience and flexibility of asynchronous communication. Respondent students indicate extremely high self-confidence in their ability to learn all four language skills online. This trend indicates a move away from previous skepticism about the ability of online sites to develop speaking and listening competencies. While previous studies (e.g., Alqahtani & Rajab, 2022; Castaneda & Selwyn, 2018; Khafaga & Al-Johani, 2024) had sought to highlight online learning's comparative advantage in reading and writing because it is text-based, the present study reveals that with current interactive tools, students can see oral-aural competencies as being equally facilitated.

The analysis further clarifies that online learning supports sustainable learning habits such as review, self-discipline, and goal-setting. This finding aligns with self-regulated learning theory (Pintrich, 2000), which emphasizes metacognitive control as the key to sustaining learning in the long term. The fact that students plan to continue learning after finishing courses has been previously supported by Little's (2007) study, in which he argues that the identification of long-term independence is possible in online learning settings. Compared with traditional classrooms, the structure of online learning seems to promote more consistent participation and goal-oriented learning behavior, at least among self-motivated learners. Furthermore, the analysis shows that students attribute long-term benefits to online learning for developing confidence and competence in English. This shows that online learning environments do more than provide short-term instructional benefits; they shape learners' conceptions of their ability to learn and improve over time. This finding is consistent with the findings of Kim and Frick (2011), who found that longer interaction on the internet can lead to sustained gains in language learner self-efficacy and perceived control, and that context plays a dominant role in affecting perceived efficacy.

It is analytically demonstrated that the online learning environment is perceived as a low-anxiety context for EFL students' WTC. The virtual classroom reduces students' anxiety and makes them more willing to speak. This supports MacIntyre and Doucette's (2010) argument that WTC is extremely sensitive to classroom context and that anxiety is a powerful barrier. The mitigating effect of online learning, particularly through private, self-paced, or small-group interaction, offers a psychologically safe environment, which encourages more active speaking. These results also concur with Derakhshan et al. (2021) and Alharbi (2023), who argue that online environments reduce language anxiety and increase students' risk-taking in communication. Also, the obtained results indicate that students perceive online learning as full of opportunities for interaction, such as breakout rooms, question and answer participation, and group work. This finding reconciles with Hampel and Stickler's (2012) argument that thoughtfully designed web-based learning can allow for more balanced opportunities to speak than classrooms. Learners' willingness to communicate is grounded in more learner agency, which aligns with WTC as a trait-state variable (MacIntyre et al., 1998). Crucially, despite the recognized weaknesses of virtual group work (e.g., low accountability), students nevertheless viewed it as effective, contravening the idea that collaboration is not so effective in online contexts.

Furthermore, the obtained results show that students are not only more confident about their ability but also more likely to take communicative risks in online contexts. This is a significant change from previous pre-pandemic studies (e.g., Chen & Goh, 2011) where digital language learning was more viewed as passive and lacking in affective investment. This finding is more pertinent to post-COVID studies (Alqahtani & Rajab, 2022), where learners felt more confident and prepared to communicate with greater exposure to digital English settings. The openness to using unfamiliar words and structures allows for the development of a growth mindset through the safe experimentation that online environments offer. It is also clarified that students' online WTC is longitudinal, beyond the class, and points towards cultural openness and long-term communicative intention. The finding that students report being more likely to converse with individuals from a different culture is significant as it pertains to world English capability (Crystal, 2012) and intercultural communicative capability (Byram, 1997). This transcends instrumental learning and discusses integrative motivation, a salient element of enduring language development. It is also consistent with Lai et al.'s (2015) argument that students who are engaged with international learners online exhibited higher levels of motivation to maintain language usage.

Concerning the teachers' perception of the impact of online learning on EFL students' self-efficacy and willingness to communicate, the obtained results offer valuable triangulation, which states that while the teachers are overwhelmingly optimistic regarding the impact of online learning on self-efficacy as well as WTC, they are cautious with its long-term persistence. Teachers seem particularly concerned about discrepancies between student profiles, ability, motivation, and gender, and suggest that online spaces can worsen disparities if not properly scaffolded. This result aligns with Sun and Rueda's (2012) findings that learners' differences play a significant role in determining online learning performance. Teachers' assumption that online materials allow learners to study on their own, though, suggests that technology can match the playing field for self-development, provided that pedagogical models are inclusive. Crucially, students and instructors unite in comprehending that e-learning has positively influenced self-efficacy and WTC. Long-term success, however, depends on intention-oriented design, ubiquitous support, and context sensitivity. The obtained results call for more learner-centric learning trajectories, adaptive technologies, and culturally responsive pedagogies. With the increasing digitalization of learning, this study stresses

the necessity of reconciling technological affordances with psychological readiness, a view adopted by scholars like Stockwell (2013), who advocated more advanced human-technology integration in the teaching of EFL.

7. Conclusion

This study explored the extent to which online learning in Saudi higher education institutions effectively contributes to sustainable development, particularly to quality education. The analysis showed that online learning promotes sustainable academic development for Saudi EFL students in terms of two learning constructs: self-efficacy and willingness to communicate. In terms of the first research question, the analysis demonstrated that online learning fosters an encouraging and personalized learning situation in which learners can construct self-confidence about their own language use. This higher self-efficacy is partly because of how easily online resources facilitate learners to advance at their own pace, get immediate feedback, and subject themselves repeatedly to use of language in actual contexts, which, in turn, contributes to enhancing students' confidence in mastering English language tasks. Concerning the second research question, it was analytically clarified that online learning plays an influential role in encouraging students' willingness to use English for communication. Factors such as reduced communication apprehension, increased access to interactive speaking and writing practice, and availability of collaborative tools make it easier for students to communicate in a safer and more engaging context. These features of virtual learning environments encourage students to take communicative risks unfettered by fear of disapproval, and this is especially important in cultures in which face-saving and fear of error are dominant. The analysis further showed that online learning not only improves academic language acquisition but also develops the required psychological and communicative capabilities among Saudi EFL learners, thereby contributing meaningfully to their sustainable development as confident and active users of the English language.

7.1 Pedagogical Implications, Limitations, and Recommendations for Future Research

The results of this study have important pedagogical implications for the instruction of English as a foreign language in Saudi Arabia and similar contexts. Curriculum planners and teachers should consider providing students with more online and blended learning opportunities. This can be conducted by offering English language programs that emphasize interactive platforms that support learner autonomy and instant communication. Teacher education programs should also equip teachers with the digital literacy skills needed to effectively facilitate students' participation in online discussion and to create psychologically safe learning spaces that empower students' self-efficacy and willingness to communicate in English.

In terms of the limitations of the current study, the obtained results cannot be perceived as general and may not reflect the experiences of all Saudi EFL learners or institutions. The data were gathered from one university, and thus the sample of 158 students and 10 teachers might not capture all the varied experiences of Saudi EFL learners or all the Saudi EFL institutions. The study's use of self-reported data may also be biased since students and teachers might overestimate or underestimate their self-efficacy or communication behaviors in the online setting.

For future research, the study recommends the employment of a more representative and larger population from several universities and EFL settings in Saudi Arabia to enhance the generalizability of findings. Longitudinal designs would also be beneficial in assessing the long-term impact of online learning on the psychological and communicative development of EFL learners. Also, qualitative approaches such as in-depth interviews or classroom observations might provide richer, more in-depth information about how some online learning practices affect students' willingness to communicate and self-efficacy. Further, approaching the impact of virtual learning on other learning constructs than those discussed in this study (e.g., motivation, learning anxiety, etc.) might yield similar and/or different results than those revealed in the current study.

Provenance and peer review

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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