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E-learning and the Development of L2: the Case of EFL Visually-impaired Students

Radwa Elshemy, Fahad Alzahrani*
University of Tabuk, Tabuk, Saudi Arabia
*Email: fahad_alzahrani7@hotmail.com

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Abstract

The number of visually-impaired students (VIS) enrolled in higher education institutions worldwide is increasing. In the second language (L2) classroom, a range of barriers and challenges have been reported to encounter by VIS. With the global demand to shift many schools and colleges to online learning and teaching, the challenges of VIS have begun to increase. This study aims to explore the experiences of VIS in learning and studying English as a foreign language (EFL) in the realm of online education. Guided by three main research questions, this study adopts an exploratory sequential mixed method design, and the examination is based on a thematic analysis of eight semi-structured student interviews that were followed by online surveys.

Results indicated that the online environment could be advantageous for learning, yet VIS encountered considerable challenges during the online mode and was confronted with multiple language learning barriers related to the language instructor, the online environment, and remote assessment and methods. For example, the highest barriers to language e-learning related to the instructor were incompetency in e-teaching and learning and assistive technology, followed by the lack of appropriate assessment tools and methods. Accordingly, a few language skills were targeted and developed. Furthermore, prior training and degree of impairment were the most important indicators affecting EFL learning and development during e-education. The findings could help to develop a strategic plan for successful learning experiences and the implementation of appropriate tools and assessment methods in e-learning.

Keywords: e-learning - Visual Impairment, Visual Impaired students, EFL, language learning

Introduction

Globally, visually impaired students (VIS) are increasing in numbers in higher education institutions. Despite the perpetual evolvement of methods of teaching and learning, VIS worldwide, and while learning in the traditional classroom, have been reported to encounter a range of barriers and challenges in the learning process during their academic study, many of which may negatively affect their academic performance and experiences (Agesa, 2014). For example, extensive research has been conducted on the linguistic problems encountered by visually impaired and blind students in the on-site setting (e.g., Bishop, 2004; Everts, 2013; Gillion & Young, 2002; Jackson, 2007; Milian & Erin, 2001; Rose & Meyer, 2002; Vaughn, et al., 2007). The findings of these studies have found that the numerous language-related problems encountered include letter switching, distortion, and stuttering, in addition to the pragmatic language disorder, the associated problems with joint attention, and other non-verbal communication disorders. Further, the findings of Al-Ghafri (2015) indicated that VIS faces difficulties in all four skill areas, with writing being the most challenging.

These features may present particular challenges regarding their experiences in language learning. With many colleges and universities shifting their courses to the online learning mode, it may be claimed that the problems of VIS have begun to increase.

Not all visual impairments are the same. The term *visual impairment* is used to describe the consequence of an eye condition and disorder. According to The International Classification of Diseases-11 (2018), WHO divided vision impairment, according to distance vision impairment, into four levels of visual function: 1) mild vision; 2) moderate visual impairment; 3) severe visual impairment, and 4) blindness. In this research, VIS is used to refer to all blindness levels. The term, *visually impaired* is used in this research to all types of impairment despite the level and severity of conditions.

Empirical studies have found that VIS encounters barriers in all aspects of life and academia in specific. For example, they struggle to cope with lessons because of unfriendly environments, lack of adaptable teaching and learning materials, and negative attitudes towards them (Odame, et al., 2021). These barriers affect their academic performance and language development, rendering them unable to excel.

In addition, previous studies have shown that language instructors also encounter challenges when teaching EFL to SVI (Aikin, 2002; Kashdan, 2002; Kashdan & Barnes, 2003; Kormos, 2001; Mushome & Monobe, 2013; Orsini-Jones, 2009). The reported challenges include lacking qualified instructors, equipment, and services to adequately serve their needs (Butler et al., 2016). In the same perspective, Mushome and Monobe (2013) indicated that instructors found teaching VIS is rather challenging, because they were never trained to teach visually impaired students and that the institution should employ a permanent specialist in teaching students and creating a resource center for them. Similarly, Penda and Ndhlovu (2013) found that the lack of using appropriate teaching methods for learners with visual impairment could be another issue for VIS. This implies that students experience challenges when their instructors use a question and answer method, expository method, group discussion method, demonstration method, and inquiry method.

In online education, instructors were challenged with the lack of online teaching practices, appropriate content preparation, or technical support (Bao, 2020). There are particular competencies needed by language instructors (Constantinou, 2018). Language instructors may not have received adequate preparation to address the linguistic and cultural needs of students in the online realm. Therefore, they should seek professional development to enhance their skills in these areas. Lukas and Yunus (2021) emphasized that adjustments “were necessary to employ effective instructional pedagogy, teachers' technological readiness to conduct e-learning and giving constructive support to all needed” (p. 344).

The application and integration of technology in English language instruction have created opportunities (Dashtestani & Stojkovic, 2016). The incorporation of Learning Management Systems (LMS), such as Blackboard, has made e-learning especially possible. With the transition to a digital educational environment, almost all Saudi universities used this online platform. Yet, it was claimed that all students were faced with a lack of appropriate e-learning skills such as lack of self-discipline, appropriate studying content, or proper learning environments when they are studying behind the screens (Bao, 2020). Moreover, current advancements in technology in information and communication have made it easy for VIS to use assistive technologies that could help in meeting their learning needs (Al-Jarf, 2021). Regardless of the availability of multiple assistive technologies and resources, VIS still may face challenges and barriers in accessing and using assistive technolo-

gies such as inconsistent policies, inappropriate universal design, lack of monitoring and accountability, and inequities in accessing bandwidth infrastructure and devices.

In Saudi Arabia, competent speakers of English are in high demand nationwide, and "are becoming prerequisites in an increasing number of domains and functions." (Al-Seghayer, 2019, p. 491). This demand is also synchronized with the newly realized significance of English for scientific and technological progress and career advancement, and as a means to access worldwide businesses. (Al-Seghayer, 2019). Although a few, research studies conducted on VIS in the Saudi context has already sparked some attention (Al-Jarf, 2021; Albulayhi, 2018, to mention some), yet, very few studies have focused on language learning by VIS (e.g., Almalki, 2021). Using the narrative inquiry, Almalki (2021) sought to understand the challenges visually impaired female students faced in learning EFL during the online classroom environment and found that teaching practices, curriculum, and the supply of resources meant for the VIS were among the most challenging.

Furthermore, the scarcity of research conducted on EFL learning experiences by VIS online has also motivated the current investigation. Amongst the paucity of research was Hamid (2020). Still, his study approached VIS from a different angle. In particular, he investigated: 1) the perceptions of utilizing Digital Platforms in online learning; 2) the barriers they faced in using Digital Platforms, and 3) the kinds of digital platforms that are appropriate for them. Despite the findings of earlier research that VIS interaction and language learning experiences are different from sighted students, no studies, to our knowledge, have specifically focused on the obstacles and challenges encountered by VIS when learning EFL and whether e-learning is convenient for them or not.

Study aims

The current study intends to: 1) assess the reality of learning EFL online by VIS; 2) identify the VISs' challenges in learning English in e-learning, and 3) examine the variables affecting VIS experiences while learning EFL through the e-mode. To meet the study objectives and to address the research gap, this research seeks to answer the following guiding questions:

Q1. How does VIS view their EFL learning experiences in the online environment?

Q2. If any, what are the most EFL learning challenges reported by VIS to have been encountered during the virtual world and affected their L2 development?

Q3. Are there any statistically significant differences between the response rate of VIS on language development experiences in terms of the following variables: 1) gender; 2) academic major; 3) degree of visual impairment; and 4) training received on assistive technologies?

Methodology

Description of the study context

The study targeted students from one public university setting which is located in the North west of Saudi Arabia. The university consists of over 35 thousand students, and the number of students with visual disabilities is estimated at 35 students from all majors. This university setting follows inclusive education in which any student with a visual disability is included in classrooms of normal students.

Participants

The participants were purposefully recruited for the study from one region of Saudi Arabia. Students who met specific criteria were eligible to take part in the study. The criteria were as follows: 1) a college student; 2) visually blind or impaired; (3) is currently enrolled in EFL classes; and (4) English is not their native language. Meeting these criteria of selection, the participants of this study were all adult college students with different levels of visual impairment and were enrolled in

a public Saudi university's EFL online classes. The students were all Saudi non-native speakers of English and both genders.

Study approach and design

This study adopted a mix of both quantitative and qualitative approaches which can help to understand research questions and gain a better understanding of a complex phenomenon (Creswell, 2005; Dörnyei, 2007). Mixed methods research can also assist in achieving a fuller understanding of a target phenomenon, besides improving the validity of the research and reaching multiple audiences (Dörnyei, 2007). Additionally, this study adopted the exploratory sequential design in which the researchers collected qualitative and quantitative information sequentially in two phases (as in Figure 1), with one form of data collection following and informing the other. In other words, this design consists of first collecting qualitative data and then collecting quantitative data, which helps to explain or elaborate on the qualitative results. In this design, qualitative data is first collected and analyzed, and themes are used to drive the development of a quantitative instrument to further explore the research problem (Creswell & Plano Clark, 2011; Tashakkori & Teddlie 2008; Onwuegbuzie, et al. 2010). Before conducting the study, a pilot study was needed for both phases: the quantitative phase and the qualitative phase.

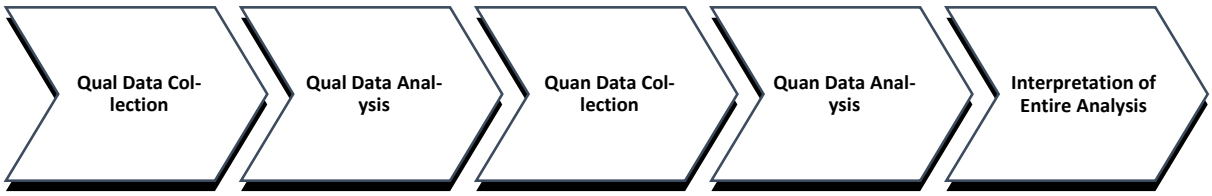

Figure 1: The exploratory sequential design (Tashakkori & Teddlie, 2003)

Study instruments

Given the primary aim of this study, two instruments were determined to be used for data collection: students' interviews and surveys. These are discussed next.

Students' interviews

The main aim of conducting interviews was to focus on the important challenges that faced a sample of VIS while learning English virtually. A general invitation email was sent out to all prospective participants to take part in a Zoom interview. A total of 15 students were interested in taking part in the interviews. The researchers randomly contacted 12 of them, and eight of them (four males and four females) participated in the semi-structured interviews. Their information is displayed in Table 1. The interviews were conducted by both researchers, and each interview lasted approximately 20 minutes. The interview questions were developed in English, and students were encouraged to ask for clarification or translation of questions when needed. Only a few students answered some questions in their native language, Arabic. As native speakers of Arabic, the researchers had no problems understanding the students' few Arabic responses and translating, transcribing, and analyzing data. The participants were informed that the study was voluntary and that they would not be rewarded for their involvement. Neither one of the two researchers had taught any of the participants.

Table 1. Summary of demographic information of interviewees

Interviewee	Gender	Level of impairment	Major/field of study
Participant1	Male	Blind	Arabic Language
Participant2	Male	Blind	Islamic Studies
Participant3	Male	Severe impairment	Jurisprudence and Law
Participant4	Male	Mild impairment	English language
Participant5	Female	Blind	Arabic Language
Participant6	Female	Blind	Arabic Language
Participant7	Female	Blind	Physical Therapy
Participant8	Female	Severe impairment	Islamic Studies

Student surveys

Data from the qualitative phase were used to develop a survey instrument for the second quantitative phase of the study. Targeting VIS who were enrolled in EFL courses in the virtual reality, the following four dimensions arose from Phase I: 1) online environment, course instructor; 2) assessment and methods of teaching; and 3) development of language skills. The survey was thus developed to measure the dimensions in a total of 43 statements on a five-Likert scale divided into sections according to the dimensions, besides four questions at the very beginning for eliciting demographic information. The survey was developed in both Arabic and English. Finally, Cronbach's alpha coefficient (also known as the coefficient alpha technique) was tested for reliability as internal consistency (Cronbach, 1951) and scored .811 which is high reliability (>.7) indicating that this instrument was valid and reliable. Being validated, the surveys were distributed online using Google Forms over the fall semester of 2021.

Data analysis

Analysis of interview transcripts

The qualitative phase of the study has divulged interesting information on the learning experiences of EFL virtually. To this end, the interview responses were transcribed, summarized, and separated into common themes, following the thematic analysis proposed by Braun and Clarke (2006). Interrater reliability was calculated through joint-probability of agreement. Both authors jointly coded the data thematically, and most themes were agreed upon. The disagreement was settled after further discussion. Frequencies and percentages, as applicable, were then used.

Analysis of students' surveys

The data gathered from the survey respondents were analyzed quantitatively using IBM Statistical Program for Social Science (SPSS® version 26). Descriptive analysis was performed by methods such as mean, standard deviation (SD), T-test, and one-way ANOVA, along with correlation analyses were used for data analysis.

Ethical considerations

All ethical considerations were adhered to throughout the process of conducting the study. All data in this study was generated with students' explicit permission. No participant was coerced into participating in the study. Every student was informed that he or she could withdraw from the study at any point in time without repercussions.

Results

This research intended to investigate the experiences of learning EFL by VIS in the online mode. This section commences with a qualitative analysis of the semi-structured interviews fol-

lowed by a presentation of the quantitative statistical results and a detailed exposition of the observed data.

Phase one: Analysis of semi-structured interviews.

The primary purpose of conducting students' interviews was to answer RQ.1 and RQ.2. Five overarching themes became apparent from the thematic analysis. These main themes are shown in Table 2 and presented next.

Table 2. Themes of interview transcripts analysis

#	Main Theme	Frequency
1	Students' perceptions of online learning of English	75%
2	Course instructor	62%
3	The online environment	87%
4	University policy on remote assessment and methods	87%
5	Development of language skills	100%

Theme 1: Online versus face-to-face learning mode in language learning and development. This theme reflects students' views of whether the online environment is useful and effective for EFL learning. Although some students reported that online classes could be useful for learning in general, all interviewees indicated their disagreement that it is ideal for language learning. To this end, participant 2 said, "Since English is all about skills, it is not preferred to take EFL classes online.". Participant 3 further explained that they faced many challenges that had made their EFL learning journey less enjoyable and more defiant. To be more specific, the interviews with the VIS have provided insightful findings on certain aspects that were challenging or advantageous for language learning during the pandemic. These could be classified into the following domains: course instructors of VIS, university policy on remote assessment methods, the learning environment, and the development of English skills in virtual classes. These themes are presented next using paraphrases and individual direct quotes.

Theme 2: Course instructor competence. Interviewees reported that the *language instructor* could be a hindrance to their online learning of English. They indicated that many of their course instructors lacked the following: 1) proper training on assistive technologies; 2) sufficient background on appropriate teaching methodology, and 3) utilization of assessment tools that are appropriate for VIS. The interview data has shown that instructors were unfamiliar with essential assistive technologies, and thus, could not assist students. Moreover, they tended to not use a variety of instructional methods that suit VIS learning styles. Almost all participants affirmed that teaching methods followed by course instructors were not tailored to be appropriate with VIS rather than sighted students, as there was no differentiation of instruction attempted. Besides, some learning difficulties were reported to come from the Inaccessibility of print materials and media and their suitability to VIS and the online environment. For example, One student stressed, "The absence or inappropriate formats of learning and instructional aids was the most source of our learning struggle.". Apparently, for this student and some other ones, even PDF versions of materials and files needed were not available to them during the online shift. Lastly, no variety of assessment tools was offered by instructors in their online language classrooms. Participant 8 gave the following example: "Students were assigned in discussion groups in which they were required to write about a topic rather than orally discuss it.". Due to their special needs and abilities, the participants indicated their need to be assessed in ways that are tailored to their needs and capabilities.

Theme 3: University policy on remote assessment and methods. This theme accounts for the university policy in ensuring well-designed assessment methods. Reviewing the interview transcripts, there appears to be a consensus among the participants that there could be no certain policy on assessing VIS online. Neglecting their special needs, students reported that the time allowed for assigned exams, exercises, and activities was the same as normal students. Students asserted that the time allocated for assessment and activity completion online was reported to be problematic for the participants. Plus, exam questions were also not differentiated to be suitable for VIS, nor were exam instructions written specifically for VIS. Thus, differentiation of time and type of exam questions along with providing were all needed for their language learning success in the virtual reality.

Theme 4: The online environment. The learning environment was found to be one-factor causing difficulties to the VIS in learning English. Yet, some assistive technologies were mentioned in the interviews to be useful in online learning and could lead to language development. The usefulness of assistive technologies comes from the following reasons. First, students reported that the Braille Sense Plorise machine has enabled them to access Blackboard easily. Students who reported having received training on such machines were able to access and convert soft copy versions of files provided during the online learning. Hence, they, eventually, could finish and do the work assigned to them. Second, VIS during the online learning reported they were able to independently and solely do what they are required to do in classes. 'Natiq', in particular, was very helpful in this regard. Familiarity with the effective use of assistive technologies is thus needed for online language learning.

Theme 5: Development of English skills in virtual classes

The last main theme was related to the language skills that were easier to develop through online reality. Vocabulary building was mentioned in the interviews to be the most developed skill. In this regard, two participants indicated that electronic dictionaries were especially useful in looking up new vocabulary items. Unfortunately, though, there appeared to be no balance between language skills targeted in the online classroom. Students pointed out that a full focus was on the writing skill. To put it differently, not all language skills were targeted and focused on for development. The listening skills were also among the most developed. This was due to a screen reader application called NonVisual Desktop Access (NVDA) that has enabled the students to read all written. The reading and writing skills were found to be the least developed skills by VIS during the online classes. The students reported that since this skill relies on Braille, these two skills were not targeted in online teaching since most of the students did not own any Braille device as the university does not provide one.

Due to the above-mentioned difficulties and challenges, the participants favored the physical classroom over the virtual reality. Apparently, in the traditional classroom, VIS were privileged with the participation and group work along with the non-mediated in-person support that was available to them.

Phase two: quantitative data results

Description of the participants

In total, a representative sample of 26 students participated in the online survey. Ten participants were female, and 16 were male. All of them were aged between 19 and 24 years. The findings presented below, which answer RQ. 3, encapsulate the experiences of VIS and the variable factors affecting learning EFL online during the pandemic. The presentation of the quantitative results will be according to emerging data from phase one which includes factors such as gender, academic ma-

jor, degree of visual impairment, and prior involvement in training on relevant programs such as Braille Sense Plorise machines and accessibility to Blackboard content, and language skills.

First of all, no statistically significant differences (at the level of significance of 0.05) were found between males and females. Both genders of VIS had almost the same learning experience of EFL in virtual sessions in all dimensions. Despite this, both male and female students encountered difficulties in their virtual language learning. Table 3 presents this finding.

Table 3. Results of T-test of VIS' EFL online learning according to gender

Dimensions	Gender	N	Mean	SD	T	Sig
Course instructor	Female	10	2.2563	.80442	1.603	.133
	Male	16	1.8086	.46011		
The online environment	Female	10	2.9400	.98002	1.574	.137
	Male	16	2.3813	.69207		
Assessment tools and methods	Female	10	2.5375	.90148	1.776	.098
	Male	16	1.9688	.58363		
Language skills	Female	10	2.8250	1.18468	2.097	.059
	Male	16	1.9844	.56986		
Total	Female	10	2.6410	.95065	1.834	.090
	Male	16	2.0373	.53650		

VIS were enrolled in other major courses at the same time as taking EFL courses. The medium of instruction in the other courses was found to have an impact on students' EFL learning and development during the shift. In specific, statistically significant differences were found between VIS in terms of the language of instruction used (i.e., English or Arabic) in all dimensions, as displayed in Table 4. VIS who used to study other courses in English had the highest value of grade average compared with those whose major courses were taught in Arabic.

Table 4. Results of T-test of VIS' EFL online learning according to the medium of instruction

Dimensions	Language of instruction	N	Mean	SD	T	Sig
Course instructor	Arabic	18	1.6146	.34782	-8.878	.000**
	English	8	2.8047	.21763		
The online environment	Arabic	18	2.1611	.50775	-6.308	.000**
	English	8	3.5750	.57259		
Assessment tools and methods	Arabic	18	1.7153	.26708	-15.123	.000**
	English	8	3.2500	.14940		
Development of English skills	Arabic	18	1.7500	.35094	-10.928	.000**
	English	8	3.5625	.47246		
Total	Arabic	18	1.8119	.33211	-10.964	.000**
	English	8	3.2991	.28537		

**Statistically significant at significance level 0.01

In addition, the type of impairment and severity conditions of VIS can create difficulties in learning EFL as each VIS has different sight problems and conditions (Aryanti, 2014). Hence, there

were statistically significant differences reported between VIS according to the degree of impairment in all dimensions (see Table 5). VIS whose impairment level was categorized as partial impairment, whether moderate or severe, had the highest value of grade averages. This means blind students had more difficulty in learning and studying EFL when transitioning to the online mode.

Table 5. Results of T-test of VIS' EFL online learning according to the degree of blindness

Dimensions	Degree of impairment	N	Mean	SD	T	Sig
Course instructor	Full	14	1.5580	.46219	-5.200	.000**
	Partial	12	2.4740	.43010		
The online environment	Full	14	2.0857	.70477	-4.389	.000**
	Partial	12	3.1917	.55507		
Assessment tools and methods	Full	14	1.8125	.65734	-3.176	.000**
	Partial	12	2.6250	.64182		
Language skills	Full	14	1.7500	.61823	-4.270	.000**
	Partial	12	2.9583	.82285		
Total	Full	14	1.8034	.57030	-4.418	.000**
	Partial	12	2.8133	.59351		

**Statistically significant at significance level 0.01

Finally, some participants indicated they had received training on Braille Sense Plorise and University's LMS. Student prior training, especially Braille-related kinds, was found to influence as there were statistically significant differences between VIS depending on whether they were trained and untrained. Table 6 shows that VIS who reported to have received training had the highest value of grade averages in all dimensions. A close look shows that trained students tended to develop their L2 competence more than their non-trained counterparts. The training they had received was found to be useful for VIS in terms of dealing with the online environment and navigating through the university's LMS. This was also reinforced in Phase one in which students reported training to be an essential factor.

Table 6. Results of T-test of VIS' EFL online learning according to prior-training

Dimensions	Prior training	N	Mean	SD	T	Sig
Course instructor	Untrained	18	1.6319	.37493	-7.406	.000**
	Trained	8	2.7656	.32174		
The online environment	Not trained	18	2.1389	.48159	-7.294	.000**
	Trained	8	3.6250	.47434		
Assessment tools and methods	Untrained	18	1.7847	.46732	-6.802	.000**
	Trained	8	3.0938	.41592		
Language skills	Untrained	18	1.7639	.37595	-9.551	.000**
	Trained	8	3.5313	.55400		
Total	Untrained	18	1.8315	.37185	-8.809	.000**
	Trained	8	3.2550	.40009		

**Statistically significant at significance level 0.01

Overall, as displayed in Table 7, the most important challenges VIS faced during e-learning were related to the competency of the course instructor and the assessment tools and methods used.

Table 7. Descriptive analysis of the reality of learning EFL by VIS online

Domains of the challenges	N	Mean	SD	Difficulty rank
Course instructor	26	1.9808	.63977	4
The online environment	26	2.5962	.84261	1
Assessment tools and methods	26	2.1875	.75932	2
Development of language skills	26	2.3077	.93490	3
Total	26	2.2695	.76664	

Discussion and conclusion

This study explored the students' lived experiences and perceived usefulness of the online environment in L2 learning and development. The result showed that although the online environment could be advantageous for some learning aspects, there are some difficulties faced by VIS in EFL online learning. This is in agreement with the results of previous studies such as Almalki (2021) and Aryanti (2014). Students' dissatisfaction is caused by some difficulties that come from the VIS themselves, their language instructors, the absence of general and appropriate unified assessment methods, and the learning environment. Students, for example, lacked enough background knowledge on the use of assistive technologies. The training was, thus, needed, nevertheless, still does not guarantee successful language learning online. Language instructors, on the other hand, were not knowledgeable on the use of assistive technology, were incompetent in differentiated-based and VIS-tailored instruction, implemented technology resources ineffectively, and lacked the necessary expertise. Many of these hindering factors were reported by Opie's (2018) study. Furthermore, the qualitative data indicated that VIS faces difficulties in developing all four skill areas, with reading and writing being the most challenging. This finding is in alignment with those of Al-Ghafri (2015). Although gender was not found to be a factor, students' prior training and impairment conditions were the most important indicators affecting EFL learning and development during e-education. This finding is in alignment with Aryanti's study (2014).

Implications

To help blind and visually impaired students better develop their L2 competence and overcome any potential learning challenges in online education, the following factors need to be taken into consideration: full utilization of assistive technologies, commitment from concerned stakeholders, continuous training and improvement for students, and appropriate training for instructors on the use of assistive technologies and on the designing of adequate and suitable assessment and teaching methods, training for instructors on how to deal with VIS, whether in the classroom or virtual classes according to the psychology of these individuals. Furthermore, As recommended by El-Nabih (2014), the university community should change the prevalent negative attitudes toward blind and visually impaired students and towards their abilities. Finally, a range of services is essential for VIS. Universities need to make sure the following services are available for VIS: 1) teaching aids (e.g., audio format materials, Braille-compatible files, and screen-reading software); 2) optical aids (e.g., optical/magnifying programs); 3) assistive technology devices (e.g., Braille sense devices); and 4) general policy on VIS student evaluation (e.g., time allocated, exam questions, and appropriate layout).

Study limitations and future directions

Despite the strengths of the present study, two limitations need to be acknowledged. First, interview and survey data were based on students' self-reporting; the participants recalled their current experiences with reliance on their memory. Second, the sample size of Phase two was representative, yet, relatively modest. Therefore, findings are not generalizable to all VIS and learners studying EFL or to all Saudi VIS studying in other contexts. The number of participants was suitable for the study and to accomplish this research promptly. Third, another limitation that could be addressed in future research is represented in the exclusive focus on students' self-evaluation of their language competency. Accurate measurement of students' English proficiency may be necessary to assess their levels pre-and-post the e-learning experience.

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