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Bichronous scientific writing course for medical faculty during Covid-19: a SWOT analysis experience

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Introduction: Writing and publishing scholarly articles in international peer-reviewed journals can be a challenging undertaking for medical and healthcare professionals in universities, especially in non-English speaking countries. Surprisingly, very few faculty members report receiving guidance on scientific writing. To encourage more faculty engagement in professional development courses aimed at enhancing their writing abilities, we have revamped scientific writing courses to incorporate bichronous (a combination of asynchronous and synchronous) teaching methods.

Methods: After forming a team, we performed a SWOT (strengths, weaknesses, opportunities, and threats) study of the medical faculty's present programs and proposed alternatives to prior course issues. In this interventional study, fifty-nine eligible medical educators selected by purposeful sampling underwent a two-and-a-half-month bichronous scientific writing course from March to August 2021. The perspectives of the participants were evaluated through a SWOT analysis. The data were collected through online semi-structured interviews, and data collection continued until data saturation was achieved (40 participants). Data were then coded and analyzed based on conventional qualitative content analysis principles.

Results: Our planned blending sequence and e-feedback increased the medical faculty's drive to learn, self-confidence, and autonomy while improving their writing skills. Poor ICT and network infrastructure hindered course adoption. Due to the course's time and the faculty's own online teaching, many battled with computer vision syndrome, self-discipline, and distractions. Our participants struggled with self-discipline and distractions, so setting a daily time limit may help them concentrate.

Discussion: Given the faculty's demanding professional lives, this designed course provided a learning opportunity for many that would not have been feasible otherwise.

KEYWORDS

medical faculty, English language, scientific writing, online learning/teaching, bichronous online learning/teaching, SWOT analysis

Introduction

An educational program which has become prevalent in the last 10 years is online teaching and learning, specifically in the last few years as a consequence of the COVID-19 pandemic. This technology integration turned many face-to-face in-service teachers' professional development programs into courses conducted on online platforms such as Zoom and Google Meet (Cilsalar-sagnak et al., 2022). Some of these courses have been offered either 100% synchronous or blended

(face-to-face plus synchronous) to refresh or enhance teachers' professional knowledge, skills and practices in the course of their employment (Gupta and Sharma, 2020).

One of the skills that have been emphasized for faculty members teaching at international universities is the English language, the medium through which they can not only communicate with foreign students but write quality scientific papers and attend international conferences (Barroga and Mitoma, 2019). These English courses should be explicitly tailored to faculty's needs so that many English-and online learning-related preferences are considered and many relevant challenges regarding instruction, assessment, and research (Nwokeji et al., 2016; Nazarzadeh Zare et al., 2018; Siregar et al., 2021) are compensated for this particular population.

Based on the reviewed literature, either learning (synchronous or blended) comes with its advantages and disadvantages. When pure online is used, many studies reported that these courses enable learners to take ownership and responsibility for their own learning. In general, learners positively perceive them (Khamova, 2013; Hashemi et al., 2017; Abbasi et al., 2020; Pardo and Díaz, 2020). Many other studies reported the following weaknesses: the dependence of the course on network connectivity, the inability of the instructors to monitor every learner, the failure to replace classroom instruction, the lack of transparency in the administration of online tests, poorly designed materials, and learners' lack of intrinsic desire to study English (Khamova, 2013; Razmjoo and Nouhi, 2014; Hashemi et al., 2017; Nambiar, 2020; Pardo and Díaz, 2020; Rezaie and Chalak, 2021; Taghizadeh and Ejtehadi, 2021; Tan Şişman and Bozok, 2021). On the other hand, the blended learning approach (a combination of face-to-face and online learning modalities) is also unsuitable for those with full-time jobs and other commitments that prevent them from attending face-to-face classes (Ragusa, 2017).

Therefore, because adults learn and are motivated differently and the fact that many adult learners prefer web-based solutions due to flexibility (Picciano, 2009), for this course, we made an intentional decision on how to blend the learning modalities with a purpose (Heinich et al., 1996). We, therefore, did an educational intervention by redesigning scientific writing courses using a bichronous online learning approach, specifically tailored to the faculty's needs. In this type of instruction, we thought the blend of synchronous and asynchronous online learning potentially reduces some of the challenges of pure synchronous or blended learning for this particular population, medical faculty members.

To this end, the following research question was addressed in the present study:

What are the strengths, weaknesses, opportunities, and threats of bichronous online scientific writing courses from the perspective of medical faculty?

Materials and methods

Design

This one-group interventional study was performed with a semi-structured interview among medical educators during March to August 2021. We used a basic interpretive design within a qualitative paradigm to assess this intervention.

Participants

Eligibility criteria for participants

The inclusion criteria were all the faculty members affiliated with SUMS who enrolled in the scientific writing course in 2021.

The total population of this course consisted of 68 male and female Iranian medical university faculty, with a minimum education level of a doctorate and a willingness to participate. For this study, the participants were selected through purposive sampling because we needed to select cases who, at the time of data collection, had already taken this course. All those unwilling to continue their cooperation received similar courses, and those with extended leave of absence during the study were excluded.

Fifty-nine faculty members agreed to do the semi-structured interview with the researchers; however, after interviewing 40, we stopped interviewing the rest once we felt that we had reached data saturation since no new codes or themes emerged.

Theoretical framework

The framework used in this study is based on andragogy principles emphasizing that adults learn differently from children (Knowles et al., 2005). For this study, we were inspired by Taylor and Hamdy (2013) proposed model of adult learning in which five necessary stages are involved for learning to happen for an adult. Many theories explain how adults learn, and each has its own merits. However, we chose this simple model because it combines many theories into a flow diagram that anyone designing a curriculum can follow. The following phases are involved: (Cilsalar-sagnak et al., 2022) In the dissonance phase, the learner's prior knowledge is questioned internally or externally and revealed to be insufficient. We simulated this stage with many in-class editing exercises in which the faculty members needed to identify the writing errors within the sentences extracted from scientific articles (Gupta and Sharma, 2020). During the refinement phase, the learner searches for several potential explanations or answers to a problem via investigation, reflection, and conversation. Since the entire scientific writing course was held online, we replicated this phase by adopting positive social interaction among peers while doing the activities in online classes (Barroga and Mitoma, 2019). In the next phase, the organization phase, the learner changes or restructures their concepts to consider the new information they have learned (Nwokeji et al., 2016). The feedback phase is likely the most important since learners will be forced to either reassess their schema in light of new knowledge or have their model reinforced by the feedback. In our study, this feedback was not only provided throughout the entire online classes but also provided electronically (audio-visual feedback) within 24 h after the assignment submission (Nazarzadeh Zare et al., 2018). In the final stage, the consolidation phase, the learners are provided with a single activity that brings together learning that has occurred on multiple occasions in the past. In our study, this has been replicated by many paragraph editing exercises within which the faculty needed to identify all sorts of errors (e.g., subject-verb agreement, parallel structure, fragments, run-ons,

Abbreviations: SWOT, Strengths, weaknesses, opportunities, and threats; SUMS, Shiraz University of Medical Sciences; TEFL, Teaching of English as a Foreign Language.

etc.) so that both the writing instructor and the faculty could identify and address any learning gaps. Self-directed learning emphasizes the responsibility of students for their education (Shen and Chen, 2020), while multimedia learning promotes active and interactive learning through various media such as text, audio, images, animations, or videos (Mayer, 2014). The study aimed to integrate cognitive and affective aspects of learning with digital media.

Educational intervention

For this course, we had to make an intentional decision on how to blend the learning modalities with a purpose (Picciano, 2009). We adopted ASSURE Model, developed by Heinich, Molenda, Russel, and Smaldino, in which the following steps are taken to develop a new system of instruction: (Cilsalar-sagnak et al., 2022) analyze learners, Gupta and Sharma (2020) state objectives, Barroga and Mitoma (2019) select the best media and materials, Nwokeji et al. (2016) utilize media and materials, Nazarzadeh Zare et al. (2018) require learner's participation, and Siregar et al. (2021) evaluate and revise. The curriculum mapping process using this model is very beneficial for instructors, and it was developed utilizing cognitive theories of learning as its base, in contrast to conventional design models (Heinich et al., 1996).

Based on this model, we thought the blend of synchronous and asynchronous online learning potentially reduces some of the challenges of pure synchronous or blended learning for this particular population, medical faculty members. Bichronous online learning is described by Martin et al. (2020) as a combination of asynchronous and synchronous online learning in which students can engage in anytime-anywhere learning during the asynchronous portions of the course but then engage in real-time activities during the synchronous sessions (Martin et al., 2019, 2023).

A team consisting of three language instructors and two virtual learning instructors with 15–20 years of experience designed a bichronous scientific course in which half the course content was presented to the faculty synchronously and the other half asynchronously. We designed 10-required synchronous sessions once a week, at 8:30 p.m. so that the course does not take a long time for the faculty to complete but at the same time to cover the most important writing contents the faculty needed to produce quality research papers asynchronously (10 sessions). Therefore, the course lasted two and a half months. In order to have an organizational structure for both our synchronous and asynchronous sessions, we carefully designed a template to guide our course design not only for us but also for the faculty members. Following an established guideline and having a clear organizational structure in terms of how to blend the modalities and their sequence are highly recommended by Martin et al. (2020). The exact syllabus given to the faculty at the beginning of the bichornous scientific writing course can be seen in Supplementary file 1.

The e-contents presented to the faculty asynchronously were 3–15 min video-based lectures on various academic and scientific writing subjects (e.g., different types of sentences in English, parallel structures, subject-verb agreement, articles, redundancy, cohesion, coherence, etc.). It is important to note that except for the first session which was necessary to be conducted synchronously (icebreaker), the blending sequence of the course was asynchronous followed by synchronous.

E-feedback

Although real-time feedback was given to the faculty in all synchronous classes, to increase the quality of the course, the team decided that the writing instructor would provide the feedback electronically (e-feedback) to everyone because of its richer communication nature (Borup et al., 2015). In terms of e-feedback, by utilizing a drawing digital tablet and screen-capture application to provide audio-visual feedback, video commentary began by complimenting the positive features of the paragraph and identifying areas that needed development, accompanied by some model examples.

The purpose was not to identify all problems but to highlight error patterns and assist learners in rectifying them. Additionally, online resources and links were included to provide additional help. The output MP4 files were uploaded to LMS.

Data collection tools

The researchers used semi-structured interviews to explore the strengths, weaknesses, opportunities, and threats of bichronous online scientific writing courses from the faculty's perspectives. Our interview protocol was made up of about four sets of open-ended questions and follow-up questions for elaboration or clarification (Table 1). The interview was conducted online via video or audio call on online platforms; however, notably, the interview questions were sent to them ahead of time for them to review before the interview.

Before the interview, a consent form was sent to participants and after receiving their approval, we moved further. Each participant was interviewed separately, and each interview lasted approximately 30 min. Notably, all the interviews were conducted one to two weeks after the last session of the course so that the faculty could vividly recall their scientific writing course experience. To demonstrate the trustworthiness of the interviewees' responses, Guba and Lincoln's trustworthiness criteria were fulfilled (Martin et al., 2020). To enhance the credibility and reliability of the study, various measures were implemented. The interviews were recorded to ensure accurate capture of participants' responses, and then transcribed verbatim to maintain data integrity and accuracy. Member checking was also carried out, involving sharing the transcripts with the participants who had taken part in the semi-structured interviews to obtain their

TABLE 1 Open-ended interview questionnaire.

	Interview guide
1 S	What were the strengths of this bichronous online scientific writing course?/What should be done the same way in the next writing course?/ Please provide an example.
2 W	What were the weaknesses of this bichronous online scientific writing course?/ What should be done differently next time?/Please provide an example.
3 O	How did this course improve your international competitivene ss?/ By this course, what opportunities have been opened up to you?/Please provide an example.
4 T	What external factors (political, economic, sociocultural, technological) negatively affected this writing course? Please provide an example.

feedback on the accuracy and credibility of the data. The validity of the interview content was further confirmed by 5 external e-learning and English education experts who reviewed and provided feedback on the transcripts. The authors' team also conducted multiple meetings at each stage to facilitate dynamic discussions, comparative interpretations, and consensus building on data analysis.

Data analysis

The data collection process for this study began with the sample selection. To examine the data, the researchers conducted a qualitative thematic analysis of the transcribed interview transcripts.

Four phases were taken in doing the thematic analysis. The researchers attempted to become familiar with the data in the first step by taking notes or looking over them. The data were then coded in the second stage. It entailed bolding certain words and sentences in the text and devising codes to indicate the content of the bolded sections. The next phase involved inductive and interpretative content analysis which was used to identify the key recurrent patterns. The fourth phase involved reviewing the extracted themes to guarantee their accuracy.

Results

All 40 medical educators completed the study. The demographic characteristics of the participants are shown in Table 2.

Analysis of the interview data resulted in 70 primary codes, based on 58 sub-themes, and 12 themes were identified (Table 3).

Strengths

Regarding the strengths, the first recurring theme that emerged was "Enhancing faculty's writing ability." The faculty believed this course gave them the "*ability to make extended texts using attributes like exemplifiers and connectives*" (F3) as well as teaching them "*varied sentence structures to make use of several patterns for organization*" (F5) like description and narration and "*to effectively include other people's ideas in their own writing*" (F31).

The next theme that emerged was "Willingness to learn, self-confidence, and autonomy." Without a passion for learning, learners can lose focus and interest in completing the course. However, reportedly, the faculty in this course '*really enjoyed the writing classes*' (F10) and believed '*[they] were attentive throughout the class*' (F 34).

It also seems that the blending sequence of content (asynchronous followed by synchronous) had a significant effect on the improvement of learner autonomy because many faculty members reported "*taking responsibility of [their] learning*" (F40) and "*feeling the duty to cover the contents*" (F24).

With e-learning, the faculty could get to learn at their own pace, rather than moving with the pace of the classroom, physically and pedagogically, so the "Saving time/ Flexibility of classes" theme also emerged. They believed "*online learning, especially at night, saved [them] a lot of time*" (F14) and that they "*could not attend the classes otherwise*" (F16).

Another theme that emerged was "Collaboration and competition." In this course, learners had a chance to interact and share their knowledge to complete a writing task collaboratively, and "*[they] had a lot of interaction with the instructor and other colleagues*" (F11). They also believed that "*writing and making so many sentences and looking at others' sentences and debating with the peers were engaging and fun*" (F26). It seems that this unique experience of "*see[ing] what is written by colleagues immediately on an online platform*" (F15) was one of the main benefits of writing online classes over face-to-face classes because this would give the faculty a chance to "*identify others' errors and learn how to edit them*" (F19). Interestingly, the blending model we used in this course (complement as well as enhancement models) by which the faculty had to do a lot of exercises in synchronous classes created a "*positive competition* among colleagues" *[who they] do not usually meet or work with* (F25). One faculty believed: "*I am happy that after so many years, I became a student again and …I do not know… I started to compete with other colleagues in writing better paragraphs and being better in online classes …[laugh]*" (F38).

A great number of faculty members reported that since synchronous sessions "*were recorded and half of the course contents were available to them*" (F37) and the fact that feedback was given to them electronically, they had a chance to go over the lessons and feedback over and over again, which was "*an additional bonus to their busy schedules and hectic professional life*" (F10). Since there were many similar positive comments regarding class contents and the type of feedback the faculty received, another theme emerged was "Class contents and E-feedback." Another reason that enhanced the faculty's enthusiasm to continue this course was the feedback they regularly received electronically. It was interesting for many "*to receive audio-visual feedback like this*" (F8) and believed "*seeing the feedback in the video format and hearing the constructive comments were very informing and reassuring*: (F38).

Weaknesses

On the second research question regarding the weaknesses, "Computer vision syndrome" was one of the recurrent themes because, during the pandemic, bichronous classes have increased reliance on computer screens, which caused "*visual discomfort or exacerbated headaches*" (F12) due to prolonged screen exposure, "*not necessarily because of this online class but because of all the online classes we have from the morning*" (F28).

TABLE 2 Demographic characteristics of the participants.

Gender	Male	17
	Female	23
Discipline	Clinical	13
	Para-clinical	18
	Basic sciences	9
Age	Range and mean	37–59/43
Academic degree	Assistant professor	26
	Associated professor	12
	Professor	2

TABLE 3 Themes, sub-themes, and codes.

Strength	Themes	Sub-theme	Code	Freq.
	Enhancing faculty's writing ability	Improved ability to communicate ideas, greater awareness of strengths and weaknesses as a writer, improved familiarity with what makes a manuscript publishable, a better sense of how to structure sentences	- Better/more effective writer	30
			- Better judgments	10
			- Improved my writing skills	22
			- Better/more enhanced sentence structure/grammar	35
			- Identifying my strengths and weaknesses	18
			- Shorter writing period	15
	Willingness to learn, self-confidence, and autonomy	Attentiveness, motivation, learning enjoyment, activation, persistence, confidence to publish more, self-editing, accountability	- Enjoy/enjoyment	24
			- Better editing/self-editing	21
			- More confident/ have confidence in	10
			- Willing to/willingness	12
			- More dedication	8
			- The ability to take on more responsibility for my own learning	9
			- Independence/independent/not dependent on	9
			- Not boring	8
	Collaboration and competition	promotion of group skills, cooperative environment, social skills, more participation and interaction, healthy competition	- More fun with writing tasks	21
			- Group activities/pair work/small group	22
			- Not feeling stressed in group	12
			- Learning from each other	13
			- Compete/ competition	10
			- Group feedback	8
			- More interaction	15
	Saving time/ Flexibility of classes	Flexibility, full control, improved mental health, self-paced learning	- Learning at my own pace	30
			- Learning from home	27
			- Not interrupted by …	19
			- Save time	16
			- no need to commute	30
	Class content and E-feedback	Electronic feedback, technology-mediated writing instruction and feedback, accessibility of the feedback, quality of feedback, asynchronous learning	- Constructive feedback	19
			- Audio-visual feedback	20
			- Refer back to the feedback many times	15
			- Faster respond to e-feedback	8
			- Hearing the comments and observing the paper simultaneously	6
			- e-content	10
			- Quick feedback	12
			- Watching the lessons beforehand	14
			- Stress-free in-class activities	10
Weakness	Computer vision syndrome	Zoom fatigue, digital eye strain, computer vision syndrome, eye fatigue, physical discomfort	- Eye fatigue	31
			- Headache	9
			- Tiredness	15
	Lack of self–discipline and distractions	Difficulty staying motivated, procrastination, diverted attention, digital distractions, behavioral addiction, mind-wandering	- Difficulty staying focused	21
			- Distractions at home (child, spouse, TV)	19
			- Overworked, work-overload	23
			- Too busy	29
			- Procrastination/handing in assignments on time	28
			- Might not take responsibility for my own learning	15

(Continued)

TABLE 3 (Continued)

Strength	Themes	Sub-theme	Code	Freq.
Opportunity	Remote online language courses	Flexibility, cost-effectiveness, convenience, life-long learning	- More opportunities	15
			- Convenient	12
			- Adjust the schedule to my own	9
			- Less stressful than face-to-face learning	17
			- Attend classes from any location	33
			- Financial benefits	8
	Global education policy and international development	International scientific cooperation, education policy-making, economic benefits, cross-country teams, scientific network	- Increasing interdependence between scholars, territories, and scientific organizations	10
			- Raising international competitiveness	15
			- International cooperation	12
			- Advance research agendas	9
			- Make valuable contributions to society	19
	Professional development	Reflective practice development, pedagogical approaches, teacher effectiveness and job satisfaction	- Evaluating and considering other teaching approaches	18
			- Gaining new insights into students' behavior	15
			- Improving individual teaching practice	9
Treat	Network and Internet problems	IT infrastructure challenges, ongoing connectivity issues	- Slow network	30
			- Weak Wi-Fi signal	15
			- Low-bandwidth internet	28
			- Constant technical issues	9
			- Poor audio or video quality	8
			- Not having WiFi/Ethernet connection	9
	Lack of tech skills	Poor digital literacy, lack of technical knowledge of ICT tools, digital divide and digital exclusion, generational and educational differences, lack of training	- Lack of appropriate digital skills	9
			- Lack of tech skill confident	9
			- Slow tech learner	8

Another theme under the category of weakness is "Lack of self–discipline and distractions." Since this course was offered bichronously, and it required the faculty to watch the video content before attending the synchronous sessions, many faculty members had difficulty disciplining themselves to either watch the offline content or do the related homework. For many, "*watching the offline videos was very time-consuming and tiring*" (F7). Others preferred being taught in bichronous classes rather than watching the contents asynchronously because "*[they] could never find time to study the lessons*" (F4).

Technological distractions (e.g., texting), television, and other family-related issues were among the distractions mentioned by many faculty members because the writing course was being held in the evening, and almost all of them were at home while attending the online class. One faculty stated: "*… your kid wants to show you a painting he drew; your wife wants to know what you want for dinner; your boss calls to confirm the meeting you have tomorrow … [laugh]*" (F9).

Since this writing course was a crash course, and the faulty had to watch the offline video contents and do the assignments, which normally consisted of writing or editing a paragraph per week, a significant number of faculty members felt "overwhelmed and exhausted," another weakness emerged from the threads. Some medical faculty even claimed writing the assignments '*between visiting patients*' (F13). Switching to a student role for some time, the faculty "*tended to procrastinate [their] assignments all the time, and it was really stressful*" (F29).

Opportunities

Concerning the opportunities opened up by this course to faculty members, the theme "Remote online language courses" emerged. Since most professors are very busy and the possibility of them participating in face-to-face classes is very low, and because at the same time, "*English has always been a barrier for [them]*" (F38), "*designing other virtual courses, particularly English classes should be prioritized by Global Strategies and International Affairs*" (F5).

Another theme that appeared was "Global education policy and international development." Since this course was held at the request of the Vice-Chancellor for Global Strategies and International Affairs, many faculty members mentioned that being part of this plan was "*beyond improving just [their] scientific writing*" (F39). One faculty said: "*Improving the quality of higher education in Iran requires expanding the level of international scientific cooperation …*" (F11). In the beginning, the faculty's primary goal was to improve their writing skill; however, later, they realized they could "*help both [their] international and Iranian students and researchers [they] train to gain knowledge and skills they need for a successful future career*" (F31).

SUMS offers a variety of undergraduate, Master's, PH.D., specialty, subspecialty, and fellowship programs to international students. Therefore, many faculty members were pleased that passing this course "*would give [them] more opportunities to provide international students with suitable learning and mentoring in the health care, education, and research sectors*" (F7).

Many also believed that "*this scientific writing course gave [them] a new learning opportunity [they] can apply in [their] own teaching*"; therefore, the "Professional development" theme emerged. Pedagogically, some faculty members believed "*if this bichronous course gave [them] more freedom to self-pace, [they] can, too, pass this opportunity to [their] students*" (F2). Moreover, many others believed bichronous classes were not boring because the writing instructor, "*using a* var*iety of instructional methods*," was a great motivator and facilitator, and this, it seems, gave them "*a pedagogical model to reapply in [their] online courses*" (F17). One faculty said: "*… I started making video content using Snagit or Camtasia. Before that, I was thinking it is waste of time to put so much time and effort to learn how to work with these tools*" (F29).

Threats

In answering the fourth research question, "Network and Internet problems," such as computer failure, poor internet connection, and latency were consistent vital terms in the faculty's reflections. Many experienced "*low speed of internet*" during the class and had difficulties downloading video feedback and e-contents because "*sometimes they were not played or took a long time to be downloaded*" (F40).

Although this course was conducted at the time the faculty had already gone through the shift from traditional face-to-face classes to completely online ones (during the COVID-19 pandemic), many faculty did not have enough expertise in working with electronic applications (i.e., uploading assignments to LMS, downloading them, saving offline video contents, to name a few). Therefore, the theme "Lack of tech skills" also emerged. Many mentioned their age and said, for example, "*I'm 51, and I'm not comfortable using these tools. I have thought about leaving the course so many* times" (F10). Others stated they are "*low computer literate*" and not "*comfortable with the operation of applications*" (F33).

Discussion

This study was conducted to identify internal and external factors influencing our intentional pedagogical decision to blend synchronous and asynchronous modalities in scientific writing courses presented to medical faculty. Because there are not many studies of entirely online scientific writing courses or bichronous ones presented to university educators, we considered learners' perceptions of online writing courses broadly to discuss the findings of this study.

In terms of strengths, one of the most recurrent themes was "Enhancing faculty's writing ability." This could be because, for at least some of our participants, this was the first time they had received formal instruction to learn how to improve their academic and scientific writing skills. Many undergraduate instructors "may tacitly accept poor writing because of the labor-intensive nature of teaching basic writing skills, insufficient training in writing instruction, and concerns about the need to focus on content," according to Fallahi et al. (2006, p. 171). Reportedly, many Iranian scholars without formal training in academic and scientific writing rely on Google translate and ask a professional editor to edit their manuscripts before journal submission (Kokabpeik and Fathi, 2021). Although Kol et al. (2018) found that tertiary EAP students who used Google Translate produced more words and longer, more complex sentences in their reports, the same study concluded that only advanced students could effectively identify and correct their errors. Considering our participants' intermediate to lower intermediate level of English, then we can conclude that this course has provided them with an opportunity to learn the basics of academic writing. Another reason might be the nature of writing interventions that were specifically tailored to the unique writing needs of educators affiliated with clinical medicine and paramedical sciences. This is consistent with the findings of Scott et al. (2020), who found that introducing a variety of effective pedagogical practices tailored to the needs of a specific course assignment in a blended learning environment can be highly beneficial for both students and writing tutors. Also in a recent study conducted on Iranian English learners and their most writing challenges, English learners believed that sentence structure and punctuation should be taught explicitly (Derakhshan and Karimian, 2020). In terms of bichronous nature of this course, our result is also consistent with what award-winning online instructors who experiment bichronous teaching reported about students' improved learning outcomes (Martin et al., 2019).

The next theme extracted in this study was "Enhancing educators' willingness to learn, self-confidence, and autonomy." This finding is in contrast with at least two other English courses held during the pandemic because, in those studies, Şener et al. (2020) and Meşe and Sevilen (2021) reported that online education had a negative impact on student's motivation and autonomy due to a lack of social interaction and a mismatch between expectations and content. However, in another study conducted on Indonesian university students experiencing full bichronous online learning in English for Specific Purposes classes, the researchers reported that students had positive perceptions of bichronous online learning in terms of motivations, academic achievement, and communication and interactions (Utomo and Ahsanah, 2022). The discrepancy between the aforementioned studies might be due to the nature of the classes because, in the first two studies mentioned above (Şener et al., 2020; Meşe and Sevilen, 2021), general English courses were offered online to English learners. However, in this course and the one conducted by Utomo and Ahsanah (2022), the bichronous nature of the classes and meaningful tasks tailored to learners' immediate needs made students actively engage in online sessions. According to Meşe and Sevilen (2021), learners report reduced motivation levels when they miss courses or do not participate in activities. However, neither of these was supported by our research. According to de Barba et al. (2016), participation as situational interest is contextual and dependent on the extent to which activities and content can hold students' attention. This is consistent with Çebi and Güyer (2020), who found a favorable association between student involvement with course material and motivation.

"Saving time/ flexibility of classes" was another recurring theme under the strengths of our study. Considering our participants' hectic personal and occupational life, this result is not surprising. This result is consistent with many studies, including those conducted by

Nambiar (2020) and Suadi (2021), who reported that online classes save the time otherwise spent commuting. While including "Collaboration and competition" as a recurring theme in our research, the outcomes of another study corroborated our own. Zinan and Sai (2017) found that learning English in an online environment was more effective than in a traditional classroom because it offered a more open learning environment, fewer restrictions on communication, greater time flexibility, and a more self-scheduled study plan that ensured collaboration. Consistent with our findings, another study demonstrates that online courses enhance language-learning skills, independent learning, and learner motivation (Banditvilai, 2016). Although there are many critiques (see, for example, 41) regarding LMS technologies and user-centered design in this virtual space, our study proves this otherwise because there are many reflections on our online collaborative writing course within the same space. Since one of the most typical outcomes of online writing education is increased student–student and student-instructor engagement due to the feedback loop, we strongly advocate for innovative approaches to teaching writing online (Harris and Greer, 2016).

Another key theme in our study was "Class contents and E-feedback." The results of our study align with the findings of Litterio (2018), who reported that instructor feedback and relevant course content both positively impacted students' perceptions of an online writing course and their quality of writing. In this regard, there are mixed findings in the literature. For example, in the language learning context, Perveen (2016), Kizilet and Özmen (2017), and Thach (2020) reported unsatisfactory perceptions from e-learners regarding the contents of especially speaking skills. Many students believe e-contents were neither authentic, manageable, flexible, or interactive (Sahay and Ranjan, 2020). One possible reason is that all e-content courses were taught in English, even though many students of English as a foreign language (EFL) find the language challenging (Aravindan and Ramganesh, 2010). Discouragement among language students may also result from the videos' lack of subtitles in their native language. In our study, though, the medium of instruction used to teach particular grammar points (e.g., parallel structure) to participants was Persian because we felt that grammar features of academic writing are already challenging for our participants, especially for low proficiency learners who are less motivated to learn the language (Aravindan and Ramganesh, 2010). Another reason why many e-learners were dissatisfied with e-contents might be that before COVID-19, it is unlikely that content writers had received formal training regarding instructional design for online courses and technical, pedagogical content (Sahay and Ranjan, 2020). For this study, though, the writing instructor of the course had already gone through massive training regarding the physical, affective, and cognitive design of the e-contents. In terms of the positive results we received regarding e-feedback, particularly in writing courses, our result is consistent with other studies (Cavaleri et al., 2019; Noordin and Khojasteh, 2021). One of the main reasons behind students' enthusiasm toward electronic feedback is the accessibility of the feedback for future references at any time and place (Mayer, 2009), which has been repeated in the reflections of our participants.

The last recurrent theme that appeared in the reflections of our participants was "Professional development." Although, because of the pandemic, almost all the participants had undergone formal training regarding virtual learning to enable them to hold their own classes, many faculty members believed that the practical and authentic experience gained in this particular scientific writing course helped them improve their own applied teaching strategies. Similar findings were reported in another study, which found that in a 6-to 7-week professional development course designed to enhance faculty members' knowledge, skills, and dispositions required to teach online effectively, how the course was delivered and the online teaching methods modeled by the course instructor appeared to have a more significant impact on perceptions and attitudes toward online learning than did the course contents and assignments (Borup and Evmenova, 2019). It appears that instructors' views and perspectives may be transformed through observational learning and social interactions (Gachago et al., 2017), leading to greater long-term efficacy in online education and the capacity to model optimal practices (Ertmer, 2005).

In terms of weaknesses extracted from the reflections of our participants, "Computer vision syndrome" ranked first. This result is not also surprising because of the nature of all the online classes the faculty had to hold during the day for their own students during the COVID-19 pandemic, so sitting for another online class, even for one session a week, was a burden to them. This result is consistent with the findings of many other studies that compared online classes and traditional classes in terms of digital screen time and its effect on the prevalence of computer vision syndrome (Wang et al., 2021; Seresirikachorn et al., 2022).

"Lack of self–discipline and distractions," understandably, was another weakness reported. Findings like these are consistent with those of other research done during the epidemic (Nah and Siau, 2020; Xie et al., 2020). Success in online courses requires students to avoid being sidetracked by things like the TV, their loved ones, their roommates, their phones, and other electronic gadgets (Mandasari, 2020). Self-discipline is another crucial aspect that enhances the efficiency and appeal of the learning process (Beck et al., 2016). Although online learning allows students to complete work at their own convenience (Hagger et al., 2021), individuals who struggle with self-discipline may encounter difficulties if they fail to manage their time (Ettinger and Cohen, 2020) properly. When self-discipline is overshadowed, procrastination and stress are inevitable. We believe this result is more or less due to the multiple roles our participants had to play during the day. Ettinger and Cohen (2020) claims that multitasking is counterproductive since it reduces the quality of work and makes it harder to learn. According to Sarah (2020), the COVID-19 epidemic has made it even more difficult for people to keep to their regular schedules, negatively impacting their mental health.

Taking a bichronous course also provided some opportunities for our participants. The first common thread across reflections was "Remote language courses." Regardless of the time these classes were held (during the pandemic), considering the faculty's hectic personal and professional life, it was almost impossible to train as many faculty members as possible during this short period of time in the comfort of their homes. Stone (2019) argues that older students working full-or part-time and having significant family obligations and other commitments can benefit from online learning environments that allow for many forms of peer interaction. Again, this is consistent with other evidence showing that those who choose online study over face-to-face study stress the importance of flexibility in deciding where and when to study due to the need to fit their studies around other pressing responsibilities (O'Shea et al., 2015; Stone et al., 2016; Stone, 2019).

In a global economy, most nations strive to increase their international competitiveness by providing knowledge-intensive goods and services and new job opportunities. In light of this, they broaden education and build its components and methods on abilities, competencies, and flexibility (Carnoy, 1999). Notably, in terms of teacher education and English Language Teaching, it was one of the first times that the Vice Chancellor for Global Strategies and International Affairs made a significant effort to promote Internationalization at Home to integrate an international perspective into the curriculum and incorporate the acquisition of intercultural competence (Beelen and Jones, 2015). Teachers are one of the most impacted actors in this new educational environment since the shift in the language of instruction has a direct influence on their teaching and their student's learning.

Although we did not analyze the alignment between English-medium instruction policies and instructors' practices, perspectives, or experiences in this study, our findings indicate that such courses can redefine the multiple functions that English plays in this educational setting. For effective classroom communication methods that facilitate the teaching and learning processes, sufficient English proficiency is required (Murray, 2016). To acquire disciplinary literacy, balance and proper attention must be paid to both fluency and precision as foundational skills. In addition, research demonstrates that the effectiveness of English-medium instruction courses depends not only on language proficiency but also on the mastery of discourse strategies (Sánchez-García, 2016), pedagogical abilities (Birhan, 2019), and intercultural competence (Aung and Khaing, 2016).

What posed a threat to our scientific writing course seems to be classified as technological challenges and personal challenges. This result is consistent with the result of many studies conducted in developing countries (Kanwal and Rehman, 2017; Almaiah et al., 2020) that reported that inadequate ICT infrastructure, lack of technical and I.T. skills, and poor network infrastructure impede the successful adoption of e-learning systems in developing countries. Al-Araibi et al. (2019) found that 45% of e-learning initiatives in developing countries are total failures, 40% are partial failures, and just 15% are thriving, with technological concerns serving as the essential criterion for the success of an e-learning system.

As revealed in the results, it is concluded that a bichronous learning approach can provide remarkable advantages for a specific population who, irrespective of the COVID-19 pandemic, do not have time to attend face-to-face courses. Some opportunities should also be provided so that bichronous teaching leads to broader outcomes, increasing the level of international competitiveness. However, the findings revealed some weaknesses and threats stakeholders should not neglect in the field.

Limitation and conclusion

Although one of the mentioned limitations of the SWOT analysis approach is that it does not necessarily provide solutions or offer alternative decisions, and although, in this study, we generated too much data, considering the number of participants we interviewed, we tried our best to look at the big picture and take into account all of the factors that could affect our situation. Therefore, for example, as lack of self–discipline and distractions were reported as major burdens by our participants, we recommend teaching the faculty to make schedules or perhaps allocating a specific time slot for those involved in a daytime so that it helps them better concentrate on the courses. This, however, needs further investigation to see if a similar e-learning program format conducted during the day would lead to better outcomes. This solution would also help reverse the threats because technological and personal challenges can be reduced if the faculty are physically present at their school so that the I.T. managers could assist them in case they encounter any problems and the problem of poor network infrastructure can be resolved since the university enjoys a strong network infrastructure with fast, high-quality Wi-Fi, as well as data privacy and security.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the ethics committee of Shiraz University of Medical Sciences. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants.

Author contributions

LK: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Writing – original draft, Writing – review & editing. NZ: Conceptualization, Investigation, Methodology, Software, Supervision, Writing – original draft, Writing – review & editing. ZK: Conceptualization, Supervision, Validation, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2024.1327087/full#supplementary-material

References

Abbasi, S., Ayoob, T., Malik, A., and Memon, S. I. (2020). Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pak. J. Med. Sci.* 36, 113–125. doi: 10.12669/pjms.36.COVID19-S4.2766

Al-Araibi, A. A. M., Naz'ri Bin Mahrin, M., and Yusoff, R. C. M. (2019). Technological aspect factors of E-learning readiness in higher education institutions: Delphi technique. *Educ. Inf. Technol.* 24, 567–590. doi: 10.1007/s10639-018-9780-9

Almaiah, M. A., Al-Khasawneh, A., and Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Educ. Inf. Technol.* 25, 5261–5280. doi: 10.1007/s10639-020-10219-y

Aravindan, S, and Ramganesh, E. Effectiveness of e-content in concretizing the concepts of physics among the heterogeneous teachers educators. International Conference on E-resources in Higher Education: Issues, Developments, Opportunities and Challenges. Publication Division, Bharathidasan University, Tiruchirappalli, T.N. India (2010).

Aung, T. N., and Khaing, S. S. (2016). Challenges of implementing e-learning in developing countries: A review. In Genetic and Evolutionary Computing: Proceedings of the Ninth International Conference on Genetic and Evolutionary Computing, August 26-28, 2015, Yangon, Myanmar-Volume II 9. 405–411. Springer International Publishing.

Banditvilai, C. (2016). Enhancing Students' language skills through blended learning. *Electr. J. e-Learn.* 14, 220–229.

Barroga, E., and Mitoma, H. (2019). Improving scientific writing skills and publishing capacity by developing university-based editing system and writing programs. *J. Korean Med. Sci.* 34, 1–8.

Beck, M., Estee, N., Mariana, G., and Grohowski, K. B. (2016). "Subverting virtual hierarchies: a Cyberfeminist critique of course management spaces" in *Making space: Writing instruction, infrastructure, and multiliteracies*. eds. J. Purdy and D. N. Devoss (Ann Arbor: University of Michigan Press)

Beelen, J., and Jones, E. (2015). "Redefining internationalization at home" in *The European higher education area*. eds. A. Curaj, L. Matei, R. Pricopie, J. Salmi and P. Scott (London: Springer)

Birhan, A. T. (2019). Teaching Language and Teaching Literature in Virtual Environment by Maria Luisa Carrio-Pastor. *Journal of Language and Education* 5, 111–113. doi: 10.17323/jle.2019.9440

Borup, J., and Evmenova, A. S. (2019). The effectiveness of professional development in overcoming obstacles to effective online instruction in a college of education. *Online Learn.* 23, 1–20.

Borup, J., West, R. E., and Thomas, R. (2015). The impact of text versus video communication on instructor feedback in blended courses. *Educ. Technol. Res. Dev.* 63, 161–184. doi: 10.1007/s11423-015-9367-8

Carnoy, M. *Globalization and educational reform: What planners need to know*. Paris: UNESCO (1999).

Cavaleri, M., Kawaguchi, S., Di Biase, B., and Power, C. (2019). How recorded audio-visual feedback can improve academic language support. *J. Univ. Teach. Learn. Pract.* 16, 71–90. doi: 10.53761/1.16.4.6

Çebi, A., and Güyer, T. (2020). Students' interaction patterns in different online learning activities and their relationship with motivation, self-regulated learning strategy and learning performance. *Educ. Inform.* 25, 3975–3993. doi: 10.1007/s10639-020-10151-1

Cilsalar-sagnak, H., Kaya, G., Toker, H., and Altintaş. (2022). Experiences of in-service teachers on online in-service training during pandemic period. The international journal of research. *Teacher* 13, 38–55.

de Barba, P. G., Kennedy, G. E., and Ainley, M. D. (2016). The role of students' motivation and participation in predicting performance in a MOOC. *J. Comput. Assist. Learn.* 32, 218–231. doi: 10.1111/jcal.12130

Derakhshan, A., and Karimian, S. R. (2020). An investigation of the Iranian EFL learners' perceptions towards the Most common writing problems. *SAGE Open* 10:215824402091952. doi: 10.1177/2158244020919523

Ertmer, P. A. (2005). Teacher pedagogical beliefs: the final frontier in our quest for technology integration? *Educ. Technol. Res. Dev.* 53, 25–39. doi: 10.1007/BF02504683

Ettinger, K., and Cohen, A. (2020). Patterns of multitasking behaviours of adolescents in digital environments. *Educ. Inform. Technol.* 25, 623–645. doi: 10.1007/s10639-019-09982-4

Fallahi, C. R., Wood, R. M., Austad, C. S., and Fallahi, H. (2006). A program for improving undergraduate psychology students' basic writing skills. *Teach. Psychol.* 33, 171–175. doi: 10.1207/s15328023top3303_3

Gachago, D., Morkel, J., Hitge, L., van Zyl, I., and Ivala, E. (2017). Developing eLearning champions: a design thinking approach. *Int. J. Educ. Technol.* 14, 1–14.

Gupta, R. M., and Sharma, P. (2020). SWOT analysis of online teaching during lock down: blended teaching the way forward. *Ind. J. Exten. Educ.* 56, 19–25.

Hagger, M. S., Zhang, C. Q., Kangro, E. M., Ries, F., Wang, J. C., Heritage, B., et al. (2021). Trait self-control and self-discipline: structure, validity, and invariance across National Groups. *Curr. Psychol.* 40, 1015–1030. doi: 10.1007/s12144-018-0021-6

Harris, H. S., and Greer, M. (2016). Over, under, or through: design strategies to supplement the LMS and enhance interaction in online writing courses. *Commun. Design Quart.* 4, 46–54.

Hashemi, S. M., Samani, F., and Shahbazi, V. (2017). Strengths, weaknesses, opportunities and threats (SWOT) analysis and strategic planning for Iranian language institutions development. *J. Appl. Linguis. Lang. Res.* 4, 139–149.

Heinich, R., Molenda, M., Russel, J. D., and Smaldino, S. E. (1996) in *Instructional media and technologies for learning*. ed. Printice-Hall, Inc. *5th* ed (NJ)

Kanwal, F., and Rehman, M. (2017). Factors affecting E-learning adoption in developing countries–empirical evidence from Pakistan's higher education sector. *IEEE Access* 5, 10968–10978. doi: 10.1109/ACCESS.2017.2714379

Khamova, S. L. (2013). Weaknesses in the process of English language teaching. *Int. J. Humanit. Soc. Sci.* 3, 33–36.

Kizilet, E., and Özmen, K. S. (2017). Evaluation of a Nationwide ICT reform movement in Turkey: insights from the Fatih project. I-manager's journal on school. *Educ. Technol.* 13, 33–48.

Knowles, M. S, Holton, E. F. III, and Swanson, R A. *The adult learner* (*6th*). (2005). London.

Kokabpeik, S, and Fathi, M. A survey on the satisfaction of EFL learners towards Google machine translation (English to Persian, Persian to English) and its accuracy as perceived. (2021). OSF Preprints.

Kol, S., Schcolnik, M., and Spector-Cohen, E. (2018). Google translate in academic writing courses? *EuroCALL Rev.* 26, 50–57. doi: 10.4995/eurocall.2018.10140

Litterio, L. M. (2018). Uncovering student perceptions of a first-year online writing course. *Comput. Compos.* 47, 1–13. doi: 10.1016/j.compcom.2017.12.006

Mandasari, B. (2020). The impact of online learning toward students' academic performance on business correspondence course. *J. Educ. Technol.* 4, 98–110. doi: 10.29062/edu.v4i1.74

Martin, F., Budhrani, K., Kumar, S., and Ritzhaupt, A. (2019). Award-winning faculty online teaching practices: roles and competencies. *Online Learn.* 23, 184–205. doi: 10.24059/olj.v23i1.1329

Martin, F., Kumar, S., Ritzhaupt, A., and Polly, D. (2023). Bichronous online learning: award-winning online instructor practices of blending asynchronous and synchronous online modalities. *Internet High. Educ.* 56, 1–12.

Martin, F., Polly, D., and Rithzaupt, A. D. (2020). Bichronous online learning: blending asynchronous and synchronous online learning. *EDUCAUSE Rev.*

Mayer, R. E. *Multimedia learning* (*2nd*). Cambridge: Cambridge University Press (2009).

Mayer, R. E. (2014). The Cambridge handbook of multimedia learning (Cambridge, MA: Cambridge University Press.)

Meşe, E., and Sevilen, Ç. (2021). Factors influencing EFL students' motivation in online learning: a qualitative case study. *J. Educ. Technol. Online Learn.* 4, 11–22.

Murray, N. *Standards of English in higher education: issues, challenges and strategies*. Cambridge: Cambridge University Press (2016).

Nah, F., and Siau, K. (2020). "COVID-19 pandemic – role of technology in transforming business to the new normal" in *Lecture notes in computer science Switzerland*. eds. C. Stephanidis, S. Yamamoto, H. Mori, G. Meiselwitz, F. F.-H. Nah and K. Siau (AG: Springer Nature)

Nambiar, D. (2020). The impact of online learning during COVID-19: Students' and teachers' perspective. *Int. J. Ind. Psychol.* 8, 783–793.

Nazarzadeh Zare, M., Pourkarimi, J., and Rezaeian, S. (2018). Barriers and challenges to international interactions of the faculty members in Iran. *Int. J. Educ. Manag.* 32, 652–668.

Noordin, N., and Khojasteh, L. (2021). The effects of electronic feedback on medical university Students' writing performance. *Int. J. High. Educ.* 10, 124–134. doi: 10.5430/ijhe.v10n4p124

Nwokeji, JC, Boulder, T, and Ohu, I. Language as an instructional barrier: towards support for international faculty. Paper presented at: IEEE Frontiers in Education Conference (2016). PA: Erie.

O'Shea, S., Stone, C., and Delahunty, J. (2015). I feel like I am at university even though I am online. Exploring how students narrate their engagement with higher education institutions in an online learning environment. *Distance Educ.* 36, 41–58. doi: 10.1080/01587919.2015.1019970

Pardo, B., and Díaz, M. (2020). A SWOT analysis of the communicative English language skills improvement Programme: a tool for autonomous EFL learning. *J. Eng. Stud.* 28, 109–120.

Perveen, A. (2016). Synchronous and asynchronous e-language learning: a case study of virtual university of Pakistan. *Open Prax.* 8, 21–39. doi: 10.5944/openpraxis.8.1.212

Picciano, A. G. (2009). Blending with purpose: the mutimodal model. *JALN* 13, 7–18. doi: 10.24059/olj.v13i1.1673

Ragusa, A. T. (2017). Crampton a online learning: cheap degrees or educational pluralization? *Br. J. Educ. Technol.* 48, 1208–1216. doi: 10.1111/bjet.12489

Razmjoo, S., and Nouhi, N. (2014). A SWOT analysis of the junior high school English program: grounded theory approach. *Int. J. Lang. Learn. Appl. Linguis. World* 5, 306–312.

Rezaie, F., and Chalak, A. (2021). A SWOT analysis of Instagram English teaching pages. *J. For. Lang. Teach. Trans. Stud.* 6, 25–44.

Sahay, S., and Ranjan, R. (2020). E-content creation of Spanish as a foreign language under NMEICT in India: a review. *J. Critic. Rev.* 7, 4550–4556.

Sánchez-García, D. *A contrastive analysis of Spanish and English-medium instruction in tertiary education: Teacher discourse strategies in a spoken corpus* [doctoral dissertation]. Madrid, Spain: Universidad Complutense de Madrid (2016).

Sarah, C. C.. Diambil kembali dari Covid – 19 worsened students mental health crisis. Can resilience training fix it? (2020). Available at: https://www.chronicle.com/article/covid-19-has-worsened-the-student-mental-health-crisis-can-resilience-training-fix-it/

Scott, D., Ulmer-Krol, S., and Ribeiro, J. (2020). Enhancing the academic writing abilities of first-year bachelor of education students in a blended learning environment. *Int. J. Teach. Learn. High. Educ.* 32, 87–98.

Şener, B., Sağlam Ertem, İ., and Meç, A. (2020). Online teaching experiences of ELT instructors. *J. Educ. Technol. Online Learn.* 3, 340–362. doi: 10.31681/jetol.770418

Seresirikachorn, K., Thiamthat, W., and Sriyuttagrai, W. (2022). Effects of digital devices and online learning on computer vision syndrome in students during the COVID-19 era: an online questionnaire study. *BMJ Paediatr. Open.* 6:e001429. doi: 10.1136/bmjpo-2022-001429

Shen, Y., and Chen, Y. (2020). The validity and reliability of the self-directed learning instrument. *BMC Med. Educ.* 20, 1–9. doi: 10.1186/s12909-020-02318-4

Siregar, D. I., Binangkit, I. D., and Wibowo, A. P. (2021). Exploring the internationalisation strategy of higher education: a case of Muhammadiyah higher institution. *J. Educ. Learn.* 15, 62–70.

Stone, C. (2019). Online learning in Australian higher education: opportunities, challenges and transformations. *Stud. Succ.* 10, 1–11. doi: 10.5204/ssj.v10i2.1299

Stone, C., O'Shea, S., May, J., Delahunty, J., and Partington, Z. (2016). Opportunity through online learning: experiences of first-in-family students in online openentry higher education. *Aust. J. Adult Learn.* 56, 146–169.

Suadi, S. (2021). Students' perceptions of the use of zoom and WhatsApp in ELT amidst COVID-19 pandemic. SALEE: study of applied linguistics and English. *Education* 2, 51–64. doi: 10.35961/salee.v2i01.212

Taghizadeh, M., and Ejtehadi, A. (2021). Investigating pre-service EFL teachers' and teacher educators' experience and attitudes towards online interaction tools. *Comput. Assist. Lang. Learn.* 36, 1633–1667. doi: 10.1080/09588221.2021.2011322

Tan Şişman, G., and Bozok, Ö. (2021). A SWOT analysis of the compulsory English courses in vocational technical colleges. *Hacettepe Univ. J. Educ.* 37, 1–17. doi: 10.16986/HUJE.2021067772

Taylor, D. C., and Hamdy, H. (2013). Adult learning theories: implications for learning and teaching in medical education: AMEE guide no. 83. *Med. Teach.* 35, e1561–e1572. doi: 10.3109/0142159X.2013.828153

Thach, P. N. (2020). Factors influencing interaction in an online English course in Vietnam. *J. For. Stud.* 36, 149–163. doi: 10.25073/2525-2445/vnufs.4562

Utomo, D. T. P., and Ahsanah, F. (2022). The implementation of bichronous online learning: EFL students' perceptions and challenges. *ELT Forum: Journal of English Language Teaching.* 11, 134–147. doi: 10.15294/elt.v11i2.54273

Wang, L., Wei, X., and Deng, Y. (2021). Computer vision syndrome during SARS-CoV-2 outbreak in university students: a comparison between online courses and classroom lectures. *Front. Public Health* 9:696036. doi: 10.3389/fpubh.2021.696036

Xie, X., Siau, K., and Nah, F. F. (2020). COVID-19 pandemic – online education in the new normal and the next normal. *J. Inform. Technol. Case Appl. Res.* 22, 175–187. doi: 10.1080/15228053.2020.1824884

Zinan, W., and Sai, G. T. B. (2017). Students' perceptions of their ICT-based college English course in China: a case study. *Teach. Eng. Technol.* 17, 53–76.