Challenges and opportunities of online learning: Insights from Cambodian higher education during Covid-19

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Online learning during the Covid-19 pandemic has received a lot of research attention since the start of the pandemic. Drawing on survey data from 1,024 Cambodian university students (60% were females), this study aims to contribute to an understanding of the challenges and opportunities associated with this mode of learning and explore university students' attitudes towards it. The study revealed key challenges related to the expense of purchasing Internet data, connectivity issues, disruptive environments for learning, reduced learning interactions, and psychological issues, among other challenges. On the other hand, major opportunities presented by online learning included, among others, improvements in digital knowledge and skills, greater readiness for blended/hybrid learning, enhanced preparedness for future crises, and exposure to greater integration of information and communication technology. The study also revealed that half (50.7%) of the students preferred blended/hybrid learning after the pandemic. Moreover, about one-third (34.8%) of them did not want to continue online learning, while only 14.6% preferred online learning moving forward. The study highlighted reasons behind these preferences and discussed implications for both policy and practice as well as for future research.

Introduction

The Covid-19 pandemic has drastically changed the way of life and caused considerable disruptions to the global economy (International Monetary Fund, 2021). In education, Covid-19 has left its indelible mark. It has led to the closure of schools in more than 200 countries and territories, affecting millions of students across the globe (UNICEF, 2021). As educational institutions were closed to contain the spread of Covid-19, the world has witnessed a new phenomenon, that is, the rise of online learning. All around the world, teachers and students have adapted to this new way of learning, using online platforms to facilitate the continuation of education during the pandemic.

While embracing online learning, students across the world have experienced both challenges and opportunities. Research has shown that students faced numerous challenges ranging from technical and accessibility issues (Adedoyin & Soykan, 2020; Özüdoğru, 2021) to psychological issues such as increased stress, anxiety, and frustration (Lischer et al., 2022; Looi, 2021). The opportunities, however, tended to lie mainly in the rise of online learning, greater integration of information and communication technology (ICT) in the classroom, and the digital transformation of education in certain educational

contexts (De et al., 2020; García-Morales et al., 2021; Heng, 2021; Heng & Sol, 2021a; Pokhrel & Chhetri, 2021).

Since the outbreak of the pandemic in 2020, many researchers have examined the challenges and opportunities associated with online learning, as well as the attitudes of students and relevant stakeholders toward it. For example, Besser et al. (2022) explored the adaptability issues among college students in Israel. Selco and Habbak (2021) examined both challenges and opportunities students at an American university experienced during emergency online learning. Other studies, such as Browning et al. (2021) and Lischer et al. (2022), explored the psychological impacts of Covid-19 among university students. There were also studies that looked at university students' attitudes toward online learning during the Covid-19 pandemic in different contexts (e.g., Chet et al., 2022; Hussein et al., 2020).

The objective of this study is to expand the scope of the above studies by investigating the perceptions of university students in Cambodia about online learning during Covid-19. Several studies have examined the challenges and opportunities of Covid-19 and online learning in the Cambodian context (see Chea et al., 2020; Chet et al., 2022; Em, 2021; Heng & Sol, 2021a); however, none has examined this issue by incorporating the perspectives of students from across multiple universities. This study aims to fill this research gap and shed more light on how Cambodian university students perceived online learning during the COVID-19 pandemic and whether they would like to continue to engage in online learning in the future. This study is significant in that it provides insights into how online learning is perceived in a higher education context that is under-represented in the international literature.

Literature review

Challenges to online learning

Responding to the widespread outbreak of Covid-19, social distancing became mandatory in most, if not all, countries, leading to a sudden rise in online learning as many educational institutions were directed to close temporarily (Marinoni et al., 2020). However, this unprecedented phenomenon left all stakeholders unprepared (United Nations, 2020). With no exception, university students, especially those belonging to less privileged socioeconomic families, faced a multitude of critical challenges in participating in their online learning, including technical and accessibility issues, psychological issues, adaptability struggles, and lack of motivation (see Heng & Sol, 2021b; Khan et al., 2021; Ullah et al., 2021).

Many studies have reported that technical and accessibility issues were among the major challenges hindering students from meaningfully and sufficiently engaging in their online classes (e.g., Chet et al., 2022; Jaradat & Ajlouni, 2021; Yeung & Yau, 2022). The gravity of these issues varied by country, but common challenges included unstable Internet connections, not possessing appropriate digital devices, and insufficient access to learning contents and resources. These challenges were encountered by most students across the

world, such as in China (Yeung & Yau, 2022), India (Khan et al., 2021), Jordan (Jaradat & Ajlouni, 2021), Libya (Maatuk et al., 2022), Pakistan (Adnan & Anwar, 2020; Ullah et al., 2021), the Philippines (Baticulon et al., 2021), Thailand (Imsa-ard, 2020), and Vietnam (Dinh & Nguyen, 2020).

Moreover, the abrupt shift to online learning generated several psychological effects on students, such as stress, anxiety, uncertainty, and frustration, resulting from the reduced social presence, lack of support, rising need for self-dependence, home distractions, concerns over online security and privacy, and technological issues (Cleofas, 2021; García-González et al., 2022; Li & Che, 2022). These psychological effects could have severe repercussions on students' well-being and education in the long term if not adequately recognised and addressed (Browning et al., 2021; Lischer et al., 2022).

Adaptability emerged as another daunting challenge for many students. Martin et al. (2021) referred to adaptability as "the capacity to regulate one's behaviors, thoughts, and feelings in response to novel, variable, uncertain, and unexpected situations and circumstances" (p. 1). Amid the Covid-19 pandemic, students faced difficulties adapting to online learning due to several factors. These included changes in learning styles and assessments, additional workloads, the necessity for hands-on practice for certain disciplines, the feeling of disconnection, distractions within their learning environments, technical issues, and a lack of readiness for online learning due to insufficient experience, motivation, and digital skills (Adedoyin & Soykan, 2020; Baticulon et al., 2021; Sol, 2021).

Opportunities of online learning

Despite the challenges, online learning has also presented students worldwide with numerous opportunities (Adedoyin & Soykan, 2020; Heng, 2020). Educational institutions were compelled to adopt various digital technologies and resources in the best possible way, allowing students to explore a variety of e-learning tools and platforms that enabled them to learn innovatively (Pokhrel & Chhetri, 2021; Weldon et al., 2021). For instance, the use of conferencing applications, cloud-based learning management systems, cloud storage, messaging applications, and online assessment tools were observed to rise sharply during the Covid-19 pandemic (De et al., 2020; Tarisayi & Munyaradzi, 2021). This exposure to greater use of technologies has positively improved students' digital skills and knowledge (Pokhrel & Chhetri, 2021). Furthermore, students have also benefited from the further investment of educational institutions in their digital infrastructure, as face-to-face learning was not possible during school closures (Jensen et al., 2022). That could range from the digitalisation of school services to better learning management systems, to more accessible resources and digital libraries (Heng & Sol, 2021a; Marinoni et al., 2020). The enhanced digital infrastructure will continue to serve students well beyond the Covid-19 pandemic.

Moreover, online learning during the Covid-19 pandemic provided students with greater flexibility and cost-effectiveness (Adedoyin & Soykan, 2020; Marinoni et al., 2020; Scarlota & Knipp, 2022; Weldon et al., 2021). With online learning, students can learn and continually access digital resources anywhere as long as they have a reliable Internet

connection and own an appropriate digital device. Online learning is also more self-paced, allowing students to develop, if highly self-regulated, their time management skills and self-direction, which are crucial for academic success (Chukwuedo et al., 2021). Engaging in online learning also reduces the time and related costs students need to spend on commuting (Hussein et al., 2020; Weldon et al., 2021).

Another great opportunity is increased online exchanges and collaborative learning (Heng & Sol, 2021a; Jensen et al., 2022). As educational institutions were forced to close temporarily, plenty of academic activities worldwide were shifted online, some of which remain operated online or are offered in hybrid formats for greater accessibility and convenience (Jensen et al., 2022). Educational institutions have also endeavoured to expand collaboration and partnerships to diversify their students' online learning experiences, providing them with a variety of opportunities for academic exchanges, discussions, and collaborative learning in diverse social and cultural contexts (Heng & Sol, 2021a).

On the broader picture, online learning during the Covid-19 pandemic has improved prospects for blended learning in the future (Heng et al., 2023; Marinoni et al., 2020). Accumulated enhancement of digital infrastructure and learning resources, experiences, skills, and knowledge made possible during the Covid-19 pandemic has undeniably accelerated blended learning, which will become omnipresent in modern education. These accumulations have also contributed to building digital readiness and resilience for all stakeholders should any other future crises occur (Marinoni et al., 2020).

University students' perceptions of online learning

Research exploring university students' perceptions of online learning during the Covid-19 pandemic has yielded mixed results (Bankole, 2022; Barzani & Jamil, 2021; Khan et al., 2020). While some students held positive perceptions toward online learning (Bankole, 2022; Khan et al., 2020), others struggled to adapt to this unprecedented mode of learning (Adnan & Anwar, 2020; Barzani & Jamil, 2021). Several underlying factors, including socioeconomic, technological, and emotional factors, could be attributed to these mixed perceptions about online learning (Adnan & Anwar, 2020; Yeung & Yau, 2022).

Studies across different contexts showed that most students were not in favour of online learning, citing difficulties associated with technological and psychological related issues and the perceived low effectiveness of online learning (Adnan & Anwar, 2020; García-González et al., 2022; Imsa-ard, 2020). Specifically, Imsa-ard's (2020) study with Thai university students found that most of them preferred face-to-face to online learning and were unwilling to undertake online learning in the future. Adnan and Anwar's (2020) study with Pakistani university students also revealed the dominant preference for conventional learning over the online mode of learning, as most of them believed that the conventional classroom was more motivating and effective. Moreover, studies conducted in other contexts, such as Indonesia (Laili & Nashir, 2021) and Iraq (Barzani & Jamil, 2021), found similar results, with the overwhelming majority of students holding negative perceptions

toward online learning due to the difficulties they went through and the feeling that face-to-face learning was much more effective.

On the other hand, some studies reported positive perceptions of online learning among university students in different contexts (Bankole, 2022; Khan et al., 2020; Neupane, 2021). For instance, Bankole (2022) found that most Nigerian library and information science students (about three-quarters) were, to varying degrees, satisfied with their online classes. However, only 19% of them expressed their preference for only online learning, while the majority preferred blended learning. Khan et al.'s (2020) study demonstrated positive acceptance of online learning among Indian students from various universities, citing better communication with their lecturers and peers, ease of access to learning resources, and increased flexibility as major advantages.

In the context of Cambodia, a few studies have examined university students' perceptions of online learning during Covid-19. For example, Chet et al. (2022) surveyed 1,002 undergraduate students at a large public university. Their findings revealed that 81.4% of the students did not wish to pursue online learning post-pandemic. Moreover, 62.5% of them claimed that online learning had negative effects on their academic performance because of limited access to appropriate digital devices and the Internet, lack of digital knowledge, reduced interaction, and inadequate fieldwork and hands-on experiments. About 18% of the students who wished to continue online learning correlated their willingness with perceived cost-effectiveness, varied educational platforms, and an independent learning environment, among others (Chet et al., 2022). Another study by Chan and Sarik (2020) showed that 70% of 440 Cambodian undergraduate students sampled from one public university did not want to continue online learning in the future. Key factors leading to this attitude comprised insecure Internet connections, a discouraging learning environment, and the lack of technological competence, self-regulation, and comprehension. These two studies were conducted with students from a single public university, leaving a gap in knowledge regarding the perspectives of other Cambodian university students about online learning.

In light of this knowledge gap and to gain deeper insights into Cambodian university students' perceptions of online learning, the present study has been initiated. It intends to answer one research question and three sub-questions:

1. What are Cambodian university students' perceptions of online learning during the Covid-19 pandemic?
   a. What challenges have they faced in engaging in online learning?
   b. What opportunities have they had by engaging in online learning?
   c. What are their attitudes toward online learning after the Covid-19 pandemic?

Methodology

Research design

This research was designed as a quantitative study (Creswell, 2009). We conducted an online survey using *Google Forms* and a simple random sampling method. The survey sought to identify the challenges that Cambodian university students had faced when they continued their education through online learning during Covid-19. The survey also sought to identify the opportunities university students have had when engaging in online learning. Moreover, the survey attempted to gauge students' overall perceptions of online learning, and whether or not they wished to continue online learning in the post-pandemic world.

Research setting

Presently, Cambodia is home to 130 higher education institutions, with 82 of these being privately operated (Ministry of Education, Youth and Sport [MoEYS], 2022). These institutions fall under the supervision of 14 different ministries and two state institutions, and together, they serve a total of 198,363 students (98,535 females), including 18,674 associate degree (9.4%), 170,246 bachelor degree (85.8%), 8,465 masters degree (4.3%), and 978 doctoral degree students (0.5%) (MoEYS, 2022). More than two-thirds of bachelor (69%) and masters degree students (83%) pursued degrees in social sciences and humanities.

The predominant language of instruction used in Cambodian higher education is Khmer, an official and national language of Cambodia. However, a few universities use English as a medium of instruction, while some universities also offer limited courses taught in English and other languages for specific fields of study or degrees. As for pre-Covid-19 instructional methods in Cambodian universities, common practices included lecture-based or teacher-centred teaching, rote memorisation, and insufficient active learning strategies (Chea & Lo, 2021; Song, 2015). Lecturing has been prevalent with minimal student-instructor interaction (Un & Sok, 2018). Moreover, students often struggle with English language proficiency (Hashim et al., 2014) and are expected to memorise information without adequate understanding (Song, 2015). These methods have been criticised for limiting student engagement, critical thinking, and problem-solving skills (Song, 2015). Official reports have also indicated a lack of instructional materials and teaching aids, restricting active learning strategies and student-centred approaches (MoEYS, 2019; 2021), suggesting a reliance on traditional methods without adequate incorporation of active learning or technology-based instruction.

During the Covid-19 pandemic, Cambodian universities, as well as other educational institutions, were intermittently closed for on-campus teaching and learning between March 2020 and November 2021 (Heng & Sol, 2021; Son, 2021). For example, in March 2020, all schools nationwide were instructed to close, and in September 2020, the Cambodian government began a phased reopening of schools, starting with a limited number of institutions. However, in November 2020, all schools were ordered to close

again due to a surge in Covid-19 cases. This cycle of closure and reopening continued until November 2021, when all schools were fully reopened across the nation.

Research participants

The participants in this research were Cambodian university students enrolled in associate, bachelor, masters, and doctoral degree programs at universities throughout Cambodia. There were 1,025 responses to the online survey, but one response was not from a university student, so it was excluded from the analysis. As a result, the analysis included a total of 1,024 anonymous and voluntary responses from Cambodian university students coming from 35 different universities (16 public and 19 private universities) across the country. Table 1 provides the demographic information of the participants.

Research instrument

This study employed an online questionnaire administered through *Google Forms* to collect data from the student participants. The questionnaire was written in both Khmer and English to ensure accurate understanding and overcome language barriers. It was developed by the researchers based on information from the literature review and was open for responses for approximately two and a half months, from 4 September to 20 November 2022. The questionnaire survey contained four main parts. Part 1 collected demographic data of the participants, including their gender, age, majors, qualifications, types of universities, university locations, jobs, types of digital devices, and methods of accessing the internet. Part 2, using a five-point Likert scale, sought to identify the challenges that Cambodian university students faced in engaging in online learning during the pandemic. Part 3, also using a five-point Likert scale, focused on the opportunities in relation to online learning. Part 4 of the questionnaire sought to understand students' preferences or attitudes toward online learning and whether or not they wished to continue online learning after the Covid-19 pandemic.

Data collection and analysis

The *Google Forms* survey link was sent to targeted students enrolled in Cambodian public and private universities across the country. We sought support from our networks, particularly those who were currently teaching in universities. The survey link was posted and shared through several *Telegram* channels and groups as well as *Facebook* pages and groups in order to reach potential participants.

To analyse the data, we employed the *Statistical Package for the Social Sciences (SPSS)* version 27. After importing responses from *Google Forms* into *Microsoft Excel*, the data were examined and cleaned up before they were imported into SPSS for coding and analysis. An internal reliability analysis was conducted, yielding a Cronbach's alpha of 0.94, which demonstrates excellent internal consistency across all 41 questionnaire items. Descriptive statistics were then employed to analyse the quantitative data to answer the research questions.

Ethical considerations

In this study, ethical standards were maintained throughout the research process. Permission from relevant authorities to collect the data was sought and obtained. Certain personal information, such as names, phone numbers, and email addresses, which could lead to the identification of the participants, was not collected. The identity of the participants was kept confidential, and the collected data will be destroyed five years after the completion of the study. Participation in the study was entirely voluntary, and the participants were advised that they had complete freedom to withdraw from the study at any time without any consequences.

Table 1: Demographic information of the participants (N = 1024)

Demographic	Value	Frequency	Percentage
Gender	Male	396	39.0
	Female	615	60.0
	Prefer not to say	13	1.0
Age group	16-20	262	25.6
	21-25	596	58.2
	26-30	93	9.1
	31-35	37	3.6
	36-40	24	2.3
	Older than 40	12	1.2
Major*	Science and engineering	114	11.1
	Social sciences and humanities	910	88.9
Enrolment	Associate degree	15	1.5
	Bachelor degree	881	86.0
	Masters degree	116	11.3
	Doctoral degree	12	1.2
Type of university**	Public (16 universities)	631	61.6
	Private (19 universities)	393	38.4
Location of universities	Phnom Penh (capital city)	679	66.3
	Province (10 provinces)	345	33.7
Job (besides being a student)	Student only	627	61.2
	Private company staff	230	22.5
	Public civil servant	82	8.0
	NGO staff	28	2.7
	Volunteer/intern	25	2.4
	Self-employed	23	2.3
	Others	9	0.9

* The participants' majors are grouped into two categories for ease of presentation. Science and engineering include health, agriculture, environment, physics, chemistry, biology, mathematics, information technology, chemical engineering, civil engineering, electrical engineering, and electronics engineering. Social sciences and humanities include education, business studies, arts, music, communication, journalism, history, geography, politics, legal studies/laws, and social work.

** Eight of these universities are higher education institutions that do not have the word 'university' in their names; however, they offer regular degree programs like other universities.

Results

Participants' demographic information

As can be seen in Table 1, among the 1,024 participants, 615 (60%) were females. Ages ranged from 16 to over 40, with the age group of 21-25 being the largest (58.2%). Most of the participants were enrolled in social sciences and humanities majors (88.9%) and were pursuing bachelor degrees (86%). Two-thirds of them studied in universities located in Phnom Penh, Cambodia's capital city, while 33.7% were enrolled in provincial universities. In addition, almost two-thirds (61.6%) of the participants studied in public universities, and 61.2% did not have a job besides being a university student. The rest of the student participants were also private company staff (22.5%), public civil servants (8%), NGO staff (2.7%), volunteers/interns (2.4%), self-employed (2.3%), and others (0.9%).

Electronic devices used for online learning
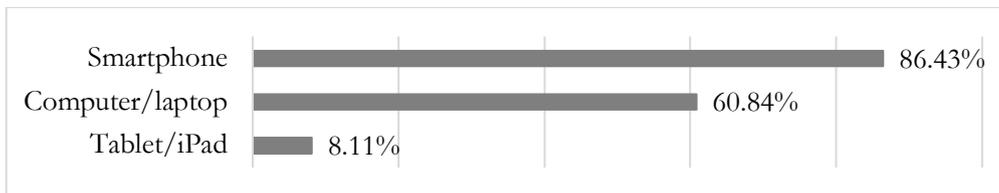
Figure 1: Electronic devices the participants used for online learning (N=1024)

The participants were asked about the types of electronic devices they used to access online learning (Figure 1). The majority of used smartphones (86.4%), almost two-thirds used computers or laptops (60.8%), and a small number of them used tablets (8.1%) to access online learning.

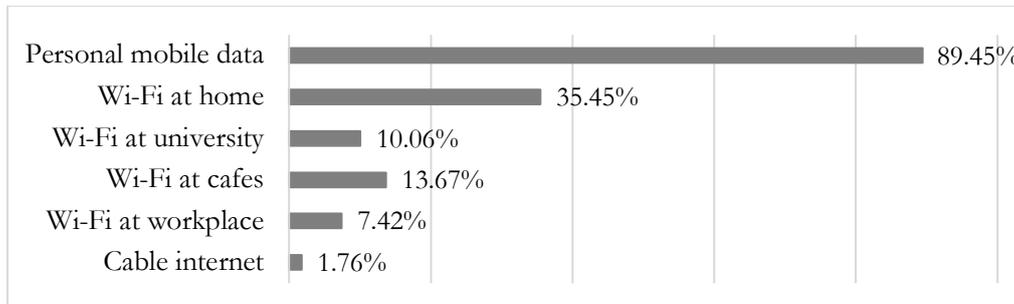### Methods of accessing the Internet for online learning

Figure 2: How the participants accessed the Internet for online learning (N=1024)

Overall, most (89.45%) students relied on personal mobile data to access the Internet for online learning (Figure 2). About one-third (35.45%) accessed the Internet via Wi-Fi at home while a small number used Wi-Fi at their universities (10.1%), coffee shops (13.7%), and workplaces (7.4%) to access the Internet to engage in online learning.

Challenges of online learning during Covid-19

Table 2: Challenges of online learning during the Covid-19 pandemic (N = 1024)

Attributes	Level of agreement (%)*				
	1	2	3	4	5
Connectivity issues (e.g., poor Internet connection, limited Internet data, etc.)	6.7	12.4	22.1	37.5	21.3
Issues with spending on purchasing Internet data	8.1	14.7	18.0	38.4	20.8
Limited access to appropriate digital devices	11.3	24.6	25.7	30	8.4
Lack of digital knowledge, skills, and experience	10.4	23.5	29.2	28.9	8.0
Lack of training on e-learning platforms and ICT skills from my university	9.2	29.2	29.2	25.6	6.8
Lack of digital resources and study materials from my university	11.1	31.3	27.1	23.6	6.9
Lack of technical support from my university	10.9	33.2	27.3	22.2	6.3
Issues with the unsuitability of curriculum for online learning	9.8	28.1	30.4	26.4	5.4
Issues with assessment activities (e.g., tests, quizzes, presentations, etc.)	9.9	25.3	31.7	26.3	6.8
Reduced interactions with lecturers and peers	10.4	23.8	21.6	31.4	12.7
Psychological issues (e.g., stress, anxiety, frustration, isolation/loneliness, etc.)	10.4	23.5	26.2	27.9	11.9
Concerns over online security, privacy, and bullying	13.7	30.8	26.5	21.9	7.2
Disruptive environments when learning from home	9.5	16.1	21.6	33.0	19.8
Ineffective teaching and learning	12.1	30.9	31.7	20.2	5.1
Difficulty in having to study more independently	10.0	25.9	32.7	24.7	6.7
Difficulty in suddenly adapting to online learning	10.4	23.0	28.5	29.1	9.0
Heavier study loads	10.9	26.9	29.8	24.5	7.9
Low motivation for online learning	11.6	21.5	28.9	26.7	11.3
Overall	10.4	24.7	27.1	27.7	10.1

* Level of agreement:1= Strongly disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly agree

As seen in Table 2, there were various challenges to online learning during the Covid-19 pandemic. Three key challenges that received the highest combined percentage of 'Agree' and 'Strongly agree' included (a) Issues with spending on purchasing Internet data (59.2%); (b) Connectivity issues (58.8%); and (c) Disruptive environments when learning from home (52.8%). These three main challenges were followed by (d) Reduced interactions with lecturers and peers (44.1%); (e) Psychological issues (39.8%); (f) Limited

access to appropriate digital devices (38.4%); (g) Difficulty in suddenly adapting to online learning (38.1%); (h) Low motivation for online learning (38%), and (i) Lack of digital knowledge, skills, and experience (36.9%).

The participants' perceptions of other challenges to online learning were split, showing their different perspectives and experiences. For example, about one-third of the participants disagreed or strongly disagreed with the statements that (a) they lacked digital knowledge, skills, and experience, (b) there were issues with the unsuitability of curriculum for online learning, and (c) there were issues with assessment activities (e.g., tests, quizzes, presentations, etc.).

Surprisingly, more than one-third of the participants either disagreed or strongly disagreed with the statements regarding (a) Lack of training on e-learning platforms and ICT skills from my university; (b) Lack of digital resources and study materials from my university; (c) Lack of technical support from my university; (d) Concerns over online security, privacy, and bullying; (e) Ineffective teaching and learning; and (f) Heavier study loads.

Overall, as seen in Table 2, Cambodian university students tended to face challenges related to connectivity issues (e.g., poor Internet connection, limited Internet data, etc.), issues with spending on purchasing Internet data, disruptive environments when learning from home, and reduced interactions with lecturers and peers when it came to continuing their education through online learning.

Opportunities of online learning during Covid-19

As for the opportunities of online learning during the Covid-19 pandemic, the Cambodian university students who participated in this study agreed that there were a number of opportunities resulting from online learning during the pandemic. As shown in Table 3, the students tended to either agree or strongly agree with several opportunities such as (a) Improvement of digital knowledge and skills (with a combined percentage of 'Agree' and 'Strongly agree' of 67.3%); (b) Improved readiness for blended/hybrid learning in the future (69.2%); (c) Preparation for future emergencies/crises (67.5%); (d) Exposure to greater ICT integration/adoption (70%); (e) Greater flexibility (e.g., can learn from anywhere, easily access learning contents, materials, and resources, etc.) (68.9%); and (f) Cost-effectiveness (e.g., save time, reduced costs on commute, etc.) (65.9%).

Two other opportunities from online learning during Covid-19 that were rated highly (with a combined percentage of 'Agree' and 'Strongly agree' of 62.8% and 63.5%, respectively) were (a) Improved access to digital learning contents, materials, and resources; and (b) Greater online learning opportunities (e.g., online exchanges, webinars, etc.). Other opportunities worth mentioning, as they received a combined percentage of 'Agree' and 'Strongly agree' of slightly over 50%, included (a) Increased self-directed/independent learning; (b) Digitalised school services (e.g., online class registration, self-serviced certificate/transcript request, etc.); (c) Improved perspectives toward global education; (d) Improved critical thinking skills; and (e) Improved ethical thinking and practices.

Table 3: Opportunities of online learning during the Covid-19 pandemic (N = 1024)

Attributes	Level of agreement (%)*				
	1	2	3	4	5
Improvement of digital knowledge and skills	4.3	11.6	16.8	45.5	21.8
Improved readiness for blended/hybrid learning in the future	4.8	11.0	14.9	49.4	19.8
Preparation for future emergencies/crises	4.6	11.3	16.6	48.7	18.8
Exposure to greater ICT integration/adoption	4.7	11.2	14.1	49.1	20.9
Improved access to digital learning contents, materials, and resources	4.7	12.4	20.1	47.3	15.5
Greater online learning opportunities (e.g., online exchanges, webinars, etc.)	6.0	11.2	19.3	46.1	17.4
Greater flexibility (e.g., can learn from anywhere, easily access learning contents, materials, and resources, etc.)	5.6	11.4	14.2	46.0	22.9
More efficient communication with peers and lecturers outside class hours	7.3	19.3	29.3	33.5	10.3
Increased self-directed/independent learning	4.5	14.2	24.0	43.1	14.3
Cost-effectiveness (e.g., save time, reduced costs on commute, etc.)	5.9	10.6	17.6	43.9	22.0
Digitalised school services (e.g., online class registration, self-serviced certificate/transcript request, etc.)	6.8	12.5	22.9	43.7	14.2
Improved perspectives toward global education	4.8	13.7	22.9	44.7	13.9
Improved critical thinking skills	5.6	14.4	25.9	42.4	11.8
Improved ethical thinking and practices	6.0	12.9	25.9	44.7	10.5
Improved learning outcomes	7.6	16.1	32.4	34.4	9.5
Overall	5.5	12.9	21.1	44.2	16.2

* Level of agreement: 1= Strongly disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly agree.

Interestingly, the participants tended to choose to be neutral or disagree with the statements that said online learning allowed "more efficient communication with peers and lecturers outside class hours" and online learning "improved learning outcomes". Only around 43% of them agreed or strongly agreed with the two statements.

Overall, Cambodian university students believed that there were a number of opportunities related to online learning during Covid-19 that provided them with the opportunity to improve their digital knowledge and skills, improve their readiness for blended/hybrid learning in the future, prepare themselves for future emergencies/crises, expose themselves to greater ICT integration or adoption, have greater flexibility for learning, and spend less time and money for learning (i.e., cost-effectiveness).

Preference for online learning after the Covid-19 pandemic

In the survey, the students were asked about their preference for online learning moving forward. As shown in Figure 3, half of the students preferred blended/hybrid learning (50.7%). Around one-third of them did not want to continue online learning after the

pandic (34.8%), while a small number of them preferred online learning after the Covid-19 pandemic (14.6%). These results showed that Cambodian university students preferred to continue their education after the pandemic in a hybrid/blended mode with a combination of face-to-face learning and online learning.
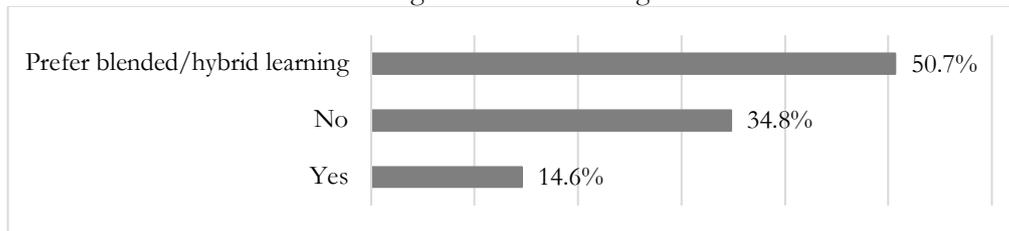

Figure 3: Students' preferences for online learning after the Covid-19 pandemic (N=1024)
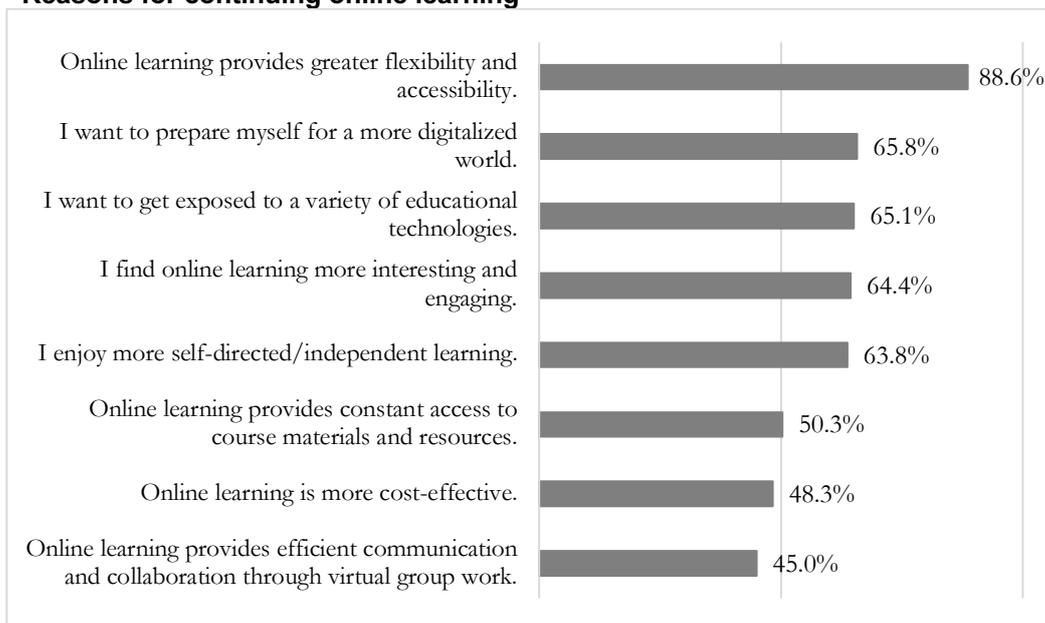
Reasons for continuing online learning

Figure 4: The participants' reasons for continuing online learning (n=149)

The students were given a list of eight potential reasons for their preferences for online learning. They were asked to select the top five reasons and provide additional reasons for their preferences for online learning. As Figure 4 shows, 149 participants responded to this question. Overall, the students chose online learning mainly because of its flexibility and accessibility (88.6%). Preparation for the digital world, the desire to get exposed to a variety of educational opportunities, an appreciation of the interestingness and engagement of online learning, and the motivation of self-directed or independent learning were also among the major reasons for online learning, receiving between 63.8% and 65.8%. Other reasons were related to accessibility and resources (50.3%), cost-effectiveness (48.3%), and efficient communication and collaboration opportunities provided by online learning (45.0%).

Reasons for not continuing online learning
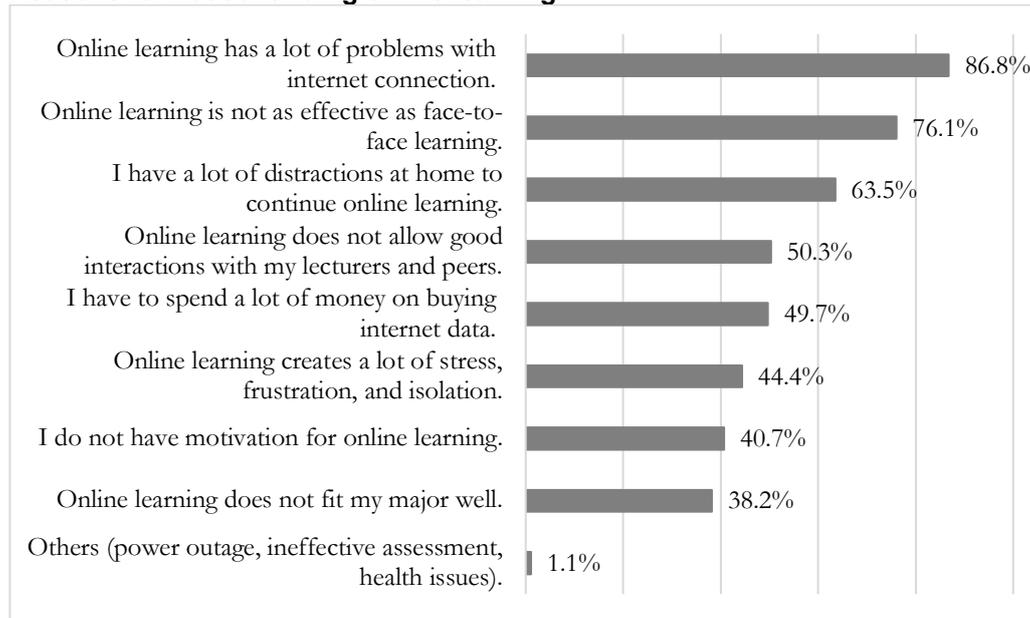

Figure 5: The participants' reasons for not continuing online learning (n=356)

More participants (n = 356) responded to the question about the main reasons why they did not want to continue online learning after the pandemic. They were also asked to choose the top five reasons from the list of eight reasons that could best explain their preferences for not continuing online learning. As shown in Figure 5, three key reasons received the highest rating from the students. These were issues with Internet connection (86.8%), concerns about the effectiveness of online learning vis-à-vis face-to-face learning (76.1%), and issues with distractions while engaging in online learning (63.5%). Other major reasons included concerns over the limited interaction with lecturers and peers (50.3%), the expense of buying Internet data (49.7%), issues with stress, frustration, and isolation (44.4%), lack of motivation for online learning (40.7%), and the limited relevance of online learning for their majors of study (38.2%). A few participants also provided other reasons for not continuing online learning, such as power outages, ineffective assessments, and health issues.

Reasons for blended/hybrid learning

As discussed above, half of the student participants preferred blended/hybrid learning after the pandemic. They were then asked to select the top five reasons from a list of eight potential reasons for their preferences for this mode of learning. As shown in Figure 6, a total of 519 students responded to this question. Overall, the primary reason for their preferences for blended/hybrid learning was the fact that this learning model allows more adaptability in terms of time, place, and resources (90.6%). Other reasons, in order of the percentage of the participants' selection, included preparation for a technology-centred future (65.7%), cost-effectiveness for commute, textbooks, and so on (63.0%), the need to

keep up with the global trend in education (61.1%), the ability to maintain face-to-face interactions with peers and lecturers (58.0%), the promotion of student ownership of learning (54.1%), the higher level of interest and engagement in the learning process (44.7%), and the increase in collaboration opportunities (35.1%). A few students also added other reasons for blended/hybrid learning, including improvement in soft skills and the ability to compare learning results between online and offline learning.
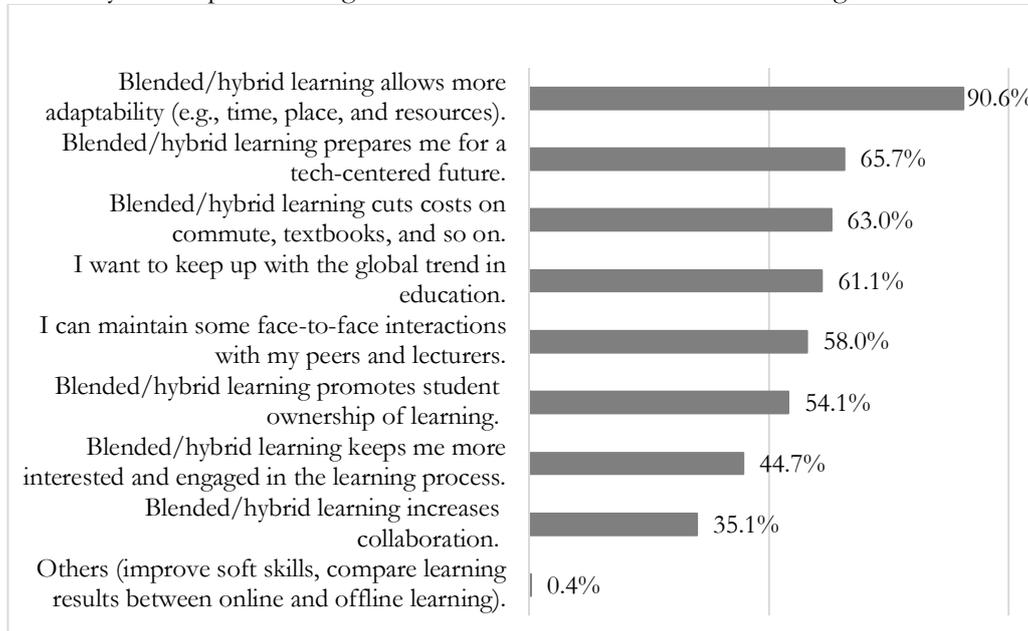
Figure 6: The participants' reasons for blended/hybrid learning (n=519)

Discussion

The results of this study are noteworthy for several reasons. First, there were more female (60%) than male (39%) students responding to the survey. In the latest Education Congress report (MoEYS, 2022), female students made up about 49% of all students enrolled in the 130 higher education institutions in Cambodia. Therefore, it is possible that more female students could fill in the survey. Second, there were more public (61.6%) than private (38.4%) university students who participated in the survey. This is rather surprising given that there are 82 private higher education institutions (63%) against only 48 public higher education institutions in Cambodia (MoEYS, 2022). However, the rest of the participants' demographic data were as expected; for example, there were more students enrolled in social science majors than those in science, and there were more responses from bachelor degree students.

This study shows that most Cambodian university students accessed their online learning during Covid-19 through smartphones or computers/laptops. Accessing online learning via smartphones is convenient, but it may have limited the extent to which they took advantage of the online learning platforms, which may in turn have affected the

effectiveness of their online learning. In addition, it was found that most of the students accessed online learning through personally purchased mobile data. This constitutes the key challenges of online learning related to connectivity issues and high expenses of purchasing Internet data, as also found by Bankole (2022) with undergraduate students in Nigeria and Em (2021) with high school students in Cambodia.

Regarding the challenges of online learning during Covid-19, the present study shows that Cambodian university students faced numerous challenges, including poor Internet connection, limited access to digital devices, reduced interactions with their teachers and classmates, psychological issues, difficulties in adapting to online learning, and motivational issues. These results provide more insights into the challenges to online learning that have been reported in previous studies in different contexts such as Armenia (Tovmasyan et al., 2022), Pakistan (Adnan & Anwar, 2020; Ullah et al., 2021), Philippines (Baticulon et al., 2021), Turkey (Özüdoğru, 2021), and the USA (Browning et al., 2021; Selco & Habbak, 2021).

The results of this study tend to show that Cambodian university students did not agree entirely with some other challenges reported in the literature. For example, they did not consider challenges such as limited digital knowledge and skills and lack of training in ICT skills, as the key challenges in their online learning. These results seem to contradict those reported by Shrestha et al. (2022), Ndibalema (2022), and Hamad (2022) who found that the lack of digital skills/competence and inadequate technological support and training were among the main issues related to online learning during the pandemic.

In terms of the opportunities of online learning, the results of this study are generally in line with previous research. For example, this study found that improvement in digital knowledge and skills, improved readiness for blended/hybrid learning, and exposure to more ICT integration, among other opportunities, were the main opportunities rated highly by the student participants. These results corroborate those of Marinoni et al. (2020), Pokhrel and Chhetri (2021), and Weldon et al. (2021) who have found similar opportunities resulting from the rise of online learning during the pandemic.

Finally, this study shows that half of the Cambodian university students preferred blended/hybrid learning to online learning, and only 14.6% preferred to study online post-pandemic. These results are consistent with previous studies examining Cambodian university students' perceptions of online learning. For example, Chet et al. (2022) found that 81.4% out of 1,002 undergraduate students surveyed did not want to study online again while Chan and Sarik (2020) found that 70% out of 440 undergraduate students involved in their study were not willing to continue online learning moving forward. These results are supported by the present study since only about 14% of the students chose 'Yes' when asked whether they wished to continue online learning after the Covid-19 pandemic. Thus, it seems that Cambodian university students did not enjoy online learning during Covid-19 and therefore preferred blended/hybrid learning in the future.

Conclusion and implications

This study has examined the challenges and opportunities of online learning during the Covid-19 pandemic from the perspectives of Cambodian university students. It has also explored the students' preferences or attitudes toward continuing online learning after the pandemic. The study has revealed several key challenges such as Internet connection issues, expenses of buying Internet data, disruptive environments for online learning, reduced interactions with others, and psychological issues, among others. It has also shown a number of opportunities provided by the embrace of online learning during the pandemic by Cambodian universities. However, despite the opportunities, the results of this study suggest that Cambodian university students do not want to pursue online learning after the pandemic, as the majority of them preferred either blended/hybrid learning or face-to-face learning.

This study has some implications. Firstly, blended/hybrid learning is the way forward. As around 85% of the students would choose future studying face-to-face or blended/hybrid learning, it is crucial for Cambodian universities and higher education institutions to pursue reforms in course curriculum and assessment to ensure they are aligned with the hybrid delivery of education. Reforms to curriculum and assessment must be accompanied by sufficient training and professional development opportunities to ensure that the administrative and academic staff are equipped with the necessary knowledge and ICT skills to implement blended/hybrid learning effectively.

Secondly, the hybrid delivery of the course content may not be successful if connectivity issues remain prevalent and students need to pay their own pocket money to access the Internet. To address this issue, investment in developing ICT infrastructure within Cambodian universities and higher education institutions is needed. To ensure success in this endeavour, the government has a pivotal role in supporting higher education institutions in improving their ICT facilities needed for blended/hybrid learning. In addition, institutions need to be proactive in seeking support from the private sector. For example, they may put extra effort into forging partnerships or collaboration with telecommunication companies to ensure the provision of reliable Internet connections on campus.

Thirdly, given the many opportunities provided by online learning, all concerned stakeholders, particularly the government, MoEYS, higher education institutions, faculty members, and students themselves, need to be open to change and new developments. Covid-19 has ushered in an unprecedented increase in digital education. In fact, it has introduced the digital transformation of higher education in Cambodia. Thus, it is essential that relevant stakeholders in Cambodian higher education should work together to maintain the momentum for the digitalisation by integrating blended/hybrid learning into the mainstream classrooms and investing in the infrastructure and capacity building needed to embrace digitalised education.

Finally, this study is not without limitations. To address the limitations of the present study and contribute to a deeper understanding of how university students perceive or experience online learning during or after the Covid-19 pandemic, future research may extend the scope of this study by examining the perspectives of academic staff or high school students, especially those in developing countries or in contexts generally under-represented in the international literature. The perspectives of school or university administrators and leaders are also worth exploring to gain a more comprehensive picture of stakeholders' perspectives on online learning. Future research may also explore problems encountered in disciplines that require intense tutorials or practical, student-centred sessions. In addition, research that investigates different aspects of this important topic using qualitative or mixed methods approaches is recommended, as are studies that employ a comparative or longitudinal research design to investigate key issues, pedagogies, and strategies concerning online learning.

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References

Adedoyin, O. B. & Soykan, E. (2020). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*, 31(2), 863-875. https://doi.org/10.1080/10494820.2020.1813180

Adnan, M. & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology*, 2(1), 45-51. https://eric.ed.gov/?id=ED606496

Bankole, O. M. (2022). Perceptions towards adoption of online learning under COVID-19 pandemic among library and information science students. *European Journal of Interactive Multimedia and Education*, 3(2), article e02210. https://doi.org/10.30935/ejimed/12271

Barzani, S. H. H. & Jamil, R. J. (2021). Students' perceptions towards online education during COVID-19 pandemic: An empirical study. *International Journal of Social Sciences & Educational Studies*, 8(2), 28-38. https://doi.org/10.23918/ijsses.v8i2p28

Baticulon, R. E., Sy, J. J., Alberto, N. R. I., Baron, M. B. C., Mabulay, R. E. C., Rizada, L. G. T., Tiu, C. J. S., Clarion, C. A. & Reyes, J. C. B. (2021). Barriers to online learning in the time of COVID-19: A national survey of medical students in the Philippines. *Medical Science Educator*, 31(2), 615-626. https://doi.org/10.1007/s40670-021-01231-z

Besser, A., Flett, G. L. & Zeigler-Hill, V. (2022). Adaptability to a sudden transition to online learning during the COVID-19 pandemic: Understanding the challenges for students. *Scholarship of Teaching and Learning in Psychology*, 8(2), 85-105. https://doi.org/10.1037/stl0000198

Browning, M. H., Larson, L. R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., Cloutier, S., Vu, T. M., Thomsen, J., Reigner, N., Metcalf, E. C., D'Antonio, A., Helbich, M., Bratman, G. N. & Alvarez, H. O. (2021). Psychological impacts from COVID-19 among university students: Risk factors across seven states in the United States. *PLOS ONE*, 16(1), article 0245327. https://doi.org/10.1371/journal.pone.0245327

Chan, R. & Sarik, S. (2020). Assessing the readiness of undergraduate students for online learning during COVID-19. *Cambodian Communication Review2020*, 31-45. http://dmc-cci.edu.kh/wp-content/uploads/2022/03/CCR-2020.pdf

Chea, P., Hun, S. & Cheam, S. (2020). Disruption and opportunities during the Covid-19 pandemic in Cambodian higher education: Perspective from teaching staff. *Cambodia Development Review*, 24(4), 1-7. https://cdri.org.kh/publication/disruption-and-opportunities-during-the-covid-19-pandemic-in-cambodian-higher-education-perspective-from-teaching-staff

Chea, S. & Lo, Y. W. (2021). Employability skills development in Cambodian higher education: A case study of English education. In *Symposium on Internationalisation and Quality Management in Higher Education 2021*, Lingnan University, Hong Kong, China. https://repository.eduhk.hk/en/publications/employability-skills-development-in-cambodian-higher-education-a-

Chet, C., Sok, S. & Sou, V. (2022). The antecedents and consequences of study commitment to online learning at higher education institutions (HEIs) in Cambodia. *Sustainability*, 14(6), article 3184. https://doi.org/10.3390/su14063184

Chukwuedo, S. O., Mbagwu, F. O. & Ogbuanya, T. C. (2021). Motivating academic engagement and lifelong learning among vocational and adult education students via self-direction in learning. *Learning and Motivation*, 74, article 101729. https://doi.org/10.1016/j.lmot.2021.101729

Cleofas, J. V. (2021). Self-care practices and online student engagement during Covid-19 in the Philippines: A mixed methods study. *Issues in Educational Research*, 31(3), 699-717. http://www.iier.org.au/iier31/cleofas.pdf

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). SAGE. [6th ed.] https://us.sagepub.com/en-us/nam/research-design/book270550

De, R., Pandey, N. & Pal, A. (2020). Impact of digital surge during Covid-19 pandemic: A viewpoint on research and practice. *International Journal of Information Management*, 55, article 102171 https://doi.org/10.1016/j.ijinfomgt.2020.102171

Dinh, L. P. & Nguyen, T. T. (2020). Pandemic, social distancing, and social work education: Students' satisfaction with online education in Vietnam. *Social Work Education*, 39(8), 1074-1083. https://doi.org/10.1080/02615479.2020.1823365

Em, S. (2021). Challenges of online learning during the COVID-19 pandemic: A survey of Cambodian high school students. *Cambodian Journal of Educational Research*, 1(2), 96-108. https://cefcambodia.com/cjer-volume-1-number-2/

García-Morales, V. J., Garrido-Moreno, A. & Martín-Rojas, R. (2021). The transformation of higher education after the COVID disruption: Emerging challenges in an online learning scenario. *Frontiers in Psychology*, 12, article 616059. https://doi.org/10.3389/fpsyg.2021.616059

García-González, A., Aznar-Diaz, I., Ramírez-Montoya, M. S. & Romero-Rodríguez, J. M. (2022). Needs and expectations of university students: Learning from the impact of Covid-19 upon 9 Spanish universities. *Issues in Educational Research*, 32(1), 126-148. http://www.iier.org.au/iier32/garcia-gonzalez.pdf

Hamad, W. (2022). Understanding the foremost challenges in the transition to online teaching and learning during COVID-19 pandemic: A systematic literature review. *Journal of Educational Technology and Online Learning*, 5(2), 393-410. https://doi.org/10.31681/jetol.1055695

Hashim, A., Leong, Y. C. & Pich, P. T. (2014). English in higher education in Cambodia. *World Englishes*, 33(4), 498-511. https://doi.org/10.1111/weng.12110

Heng, K. (2020). COVID-19: A silver lining in the crisis for Cambodia's education sector. In K. Heng, S. Kaing, V. Ros & K. Sol (Eds.), *English language teaching, education, and online learning in Cambodia during COVID-19: Perspectives from practitioners and researchers* (pp. 41-47). Phnom Penh: Cambodian Education Forum. https://cefcambodia.com/2020/12/29/english-language-teaching-education-and-online-learning-in-cambodia-during-covid-19/

Heng, K. (2021). COVID-19: A catalyst for the digital transformation of Cambodian education. *ISEAS Perspective*, 87, 1-9. https://www.iseas.edu.sg/wp-content/uploads/2021/06/ISEAS_Perspective_2021_87.pdf

Heng, K. & Sol, K. (2021a). COVID-19 and Cambodian higher education: Challenges and opportunities. In K. Heng, S. Kaing, D. Kao, M. Muong, B, Doeur & T, Lor. (Eds.), *Online learning during COVID-19 and key issues in education* (pp. 31-48). Cambodian Education Forum. https://cefcambodia.com/2021/12/14/online-learning-during-covid-19-and-key-issues-in-education/

Heng, K. & Sol, K. (2021b). Online learning during COVID-19: Key challenges and suggestions to enhance effectiveness. *Cambodian Journal of Educational Research*, 1(1), 3-16. https://cefcambodia.com/cjer-volume-1-issue-1/

Heng, K., Sol, K. & Em, S. (2023). COVID-19 and digital transformation of Cambodian higher education: Opportunities, challenges, and the way forward. In P. O. de Pablos, X. Zhang & M. N. Almunawar (Eds.), *Handbook of research on education institutions, skills, and jobs in the digital era* (pp. 307-327). IGI Global. https://doi.org/10.4018/978-1-6684-5914-0.ch018

Hussein, E., Daoud, S., Alrabaiah, H. & Badawi, R. (2020). Exploring undergraduate students' attitudes towards emergency online learning during COVID-19: A case from the UAE. *Children and Youth Services Review*, 119, article 105699. https://doi.org/10.1016/j.childyouth.2020.105699

Imsa-ard, P. (2020). Thai university students' perceptions towards the abrupt transition to 'forced' online learning in the COVID-19 situation. *Journal of Education Khon Kaen University*, 43(3), 30-44. https://so02.tci-thaijo.org/index.php/EDKKUJ/article/view/242970

International Monetary Fund (2021). Recovery during a pandemic: Health concerns, supply disruptions, price pressures. *World Economic Outlook*, 12 October. https://www.imf.org/en/Publications/WEO/Issues/2021/10/12/world-economic-outlook-october-2021

Jaradat, S. & Ajlouni, A. (2021). Undergraduates' perspectives and challenges of online learning during the COVID-19 pandemic: A case from the University of Jordan. *Journal of Social Studies Education Research*, 12(1), 149-173. https://www.learntechlib.org/p/219411/

Jensen, T., Marinoni, G. & van't Land, H. (2022). *Higher education one year into the COVID-19 pandemic: Second IAU Global Survey Report*. International Association of Universities. https://www.iau-aiu.net/IMG/pdf/2022_iau_global_survey_report.pdf

Khan, M. A., Kamal, T., Illiyan, A. & Asif, M. (2021). School students' perception and challenges towards online classes during COVID-19 pandemic in India: An econometric analysis. *Sustainability*, 13(9), article 4786. https://doi.org/10.3390/su13094786

Khan, M. A., Nabi, M. K., Khojah, M. & Tahir, M. (2020). Students' perception towards e-learning during COVID-19 pandemic in India: An empirical study. *Sustainability*, 13(1), article 57. https://doi.org/10.3390/su13010057

Laili, R. N. & Nashir, M. (2021). Higher education students' perception on online learning during Covid-19 pandemic. *Edukatif: Jurnal Ilmu Pendidikan*, 3(3), 689-697. https://doi.org/10.31004/edukatif.v3i3.422

Li, J. & Che, W. (2022). Challenges and coping strategies of online learning for college students in the context of COVID-19: A survey of Chinese universities. *Sustainable Cities and Society*, 83, article 103958. https://doi.org/10.1016/j.scs.2022.103958

Lischer, S., Safi, N. & Dickson, C. (2022). Remote learning and students' mental health during the Covid-19 pandemic: A mixed-method enquiry. *Prospects*, 51, 589-599. https://doi.org/10.1007/s11125-020-09530-w

Looi, K. H. (2021). Determinants of future preference for e-learning and its implications: A study of Malaysian business students. *Issues in Educational Research*, 31(3), 914-929. http://www.iier.org.au/iier31/looi.pdf

Maatuk, A. M., Elberkawi, E. K., Aljawarneh, S., Rashaideh, H. & Alharbi, H. (2022). The COVID-19 pandemic and e-learning: Challenges and opportunities from the perspective of students and instructors. *Journal of Computing in Higher Education*, 34(1), 21-38. https://doi.org/10.1007/s12528-021-09274-2

Marinoni, G., van't Land, H. & Jensen, T. (2020). *The impact of COVID-19 on higher education around the world*. International Association of Universities. https://www.iau-aiu.net/IMG/pdf/iau_covid19_and_he_survey_report_final_may_2020.pdf

Martin, A. J., Collie, R. J. & Nagy, R. P. (2021). Adaptability and high school students' online learning during COVID-19: A job demands-resources perspective. *Frontiers in Psychology*, 12, 1-15. https://doi.org/10.3389/fpsyg.2021.702163

MoEYS (2019). *Cambodia's education 2030 roadmap: Sustainable - Goal 4*. https://planipolis.iiep.unesco.org/en/2019/cambodias-education-2030-roadmap-6799

MoEYS (2021). *Education congress: The education, youth and sport performance in the academic year 2019-2020 and goals for the academic year 2020-2021*. https://data.opendevelopmentcambodia.net/library_record/the-education-youth-and-sport-performance-in-the-academic-year-2019-2020-and-goals-for-the-academic/resource/c970aafd-8d24-44c3-b160-24e9d9728e44

MoEYS (2022). *Education congress the education, youth and sport performance in the academic year 2020-2021*. http://moeys.gov.kh/en/media-center/education-congress/education-congress-the-education-youth-and-sport-performance-in-the-academic-year-2020-2021/

Ndibalema, P. (2022). Constraints of transition to online distance learning in higher education institutions during COVID-19 in developing countries: A systematic review. *E-Learning and Digital Media*, 19(6), 595-618. https://doi.org/10.1177/20427530221107510

Neupane, B. (2021). University students' perceptions of online learning during COVID-19 pandemic. *International Journal of Multidisciplinary Perspectives in Higher Education*, 6(2), 30-49. https://files.eric.ed.gov/fulltext/EJ1328286.pdf

Özüdoğru, F. (2021). Turkish preservice teachers' experiences with emergency remote teaching: A phenomenological study. *Issues in Educational Research*, 31(1), 166-187. http://www.iier.org.au/iier31/ozudogru.pdf

Pokhrel, S. & Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. *Higher Education for the Future*, 8(1), 133-141. https://doi.org/10.1177/2347631120983481

Scarlota, N. & Knipp, R. (2022). Experiencing emergency remote teaching as an EFL educator in Chile at the onset of the Covid-19 pandemic. *Issues in Educational Research*, 32(4), 1605-1622. http://www.iier.org.au/iier32/scarlota.pdf

Selco, J. I. & Habbak, M. (2021). STEM students' perceptions on emergency online learning during the COVID-19 pandemic: Challenges and successes. *Education Sciences*, 11(12), article 799. https://doi.org/10.3390/educsci11120799

Shrestha, S., Haque, S., Dawadi, S. & Giri, R. A. (2022). Preparations for and practices of online education during the Covid-19 pandemic: A study of Bangladesh and Nepal. *Education and Information Technologies*, 27(1), 243-265. https://doi.org/10.1007/s10639-021-10659-0

Sol, K. (2021). Rethinking higher education in Cambodia: Contemporary challenges and priorities in the post-COVID-19 era. *Journal of International Education*, 27, 46-60. https://doi.org/10.24751/jies.27.0_46

Son, M. (2021). All schools to reopen, with strict measures in place, from Nov 1. *Khmer Times*, 22 October. https://www.khmertimeskh.com/50956598/schools-to-reopen-with-strict-measures-in-place-from-nov-1/

Song, S. (2015). Cambodian teachers' responses to child-centered instructional policies: A mismatch between beliefs and practices. *Teaching and Teacher Education*, 50, 36-45. https://doi.org/10.1016/j.tate.2015.04.004

Tarisayi, K. S. & Munyaradzi, E. (2021). A simple solution adopted during the Covid-19 pandemic: Using WhatsApp at a university in Zimbabwe. *Issues in Educational Research*, 31(2), 644-659. http://www.iier.org.au/iier31/tarisayi.pdf

Tovmasyan, G., Hakhverdyan, D., Mkrtchyan, T. & Petrosyan, A. (2022). The impact of Covid-19 on education quality and learning efficiency in universities: Evidence from Armenia. *Issues in Educational Research*, 32(4), 1623-1642. http://www.iier.org.au/iier32/tovmasyan.pdf

Ullah, A., Ashraf, M., Ashraf, S. & Ahmed, S. (2021). Challenges of online learning during the COVID-19 pandemic encountered by students in Pakistan. *Journal of Pedagogical Sociology and Psychology*, 3(1), 36-44. https://doi.org/10.33902/JPSP.2021167264

UNICEF (2021). *COVID-19 and school closures: One year of education disruption.* https://data.unicef.org/resources/one-year-of-covid-19-and-school-closures/

United Nations (2020). *Education during COVID-19 and beyond.*
    https://www.un.org/development/desa/dspd/wp-
    content/uploads/sites/22/2020/08/sg_policy_brief_covid-
    19_and_education_august_2020.pdf
Un, L. & Sok, S. (2018). Higher education systems and institutions, Cambodia. In P.
    Teixeira & J. Shin (Eds.), *Encyclopedia of international higher education systems and institutions*
    (online first). Springer. https://doi.org/10.1007/978-94-017-9553-1_500-1
Weldon, A., Ma, W. W. K., Ho, I. M. K. & Li, E. (2021). Online learning during a global
    pandemic: Perceived benefits and issues in higher education. *Knowledge Management &*
    E-Learning, 13(2), 161-181. https://doi.org/10.34105/j.kmel.2021.13.009
Yeung, M. W. L. & Yau, A. H. Y. (2022). A thematic analysis of higher education
    students' perceptions of online learning in Hong Kong under COVID-19: Challenges,
    strategies and support. *Education and Information Technologies*, 27(1), 181-208.
    https://doi.org/10.1007/s10639-021-10656-3

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