ACCESS TO EDUCATION IN CAMBODIA

DURING THE COVID-19 GLOBAL PANDEMIC

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ABSTRACT

Cambodia is among the many countries affected by the COVID-19 pandemic in terms of impacts on health and the economy, and disruption of education. This research project aimed to examine and evaluate the online learning for children in Cambodia during the pandemic by analysing and assessing the strengths and limitations of each learning platform utilised by the government. The implementation of online education in Cambodia has presented a challenge, since not all students have had equal access to technology and internet connectivity necessary to benefit from remote learning platforms. The analysis is based on the secondary data collected from individual learning platforms and the Cambodian government's websites. There are several key findings arising from the research. First, online learning has complemented classroom education in Cambodia during the school closures and thus has contributed to continuous education for most children despite the disruption to normal practices. The research has shown that delivering online education through a number of different platforms has enabled students in Cambodia to access learning materials and improved learning experiences. Teaching on the Facebook platform has received the most interest from students compared to all other online learning platforms, whereas the E-learning platform was better than other platforms in terms of friendliness of user interface and content arrangement for the best experience of students. The study found that children of families living in advantaged urban areas would likely have benefited more from online education, since they are more likely to have the necessary devices, such as computers, Smartphone, and internet services, to access online learning materials. On the other hand, remote learning in Cambodia via TV has been more beneficial for those who live in many rural areas where the internet service is unavailable. Therefore, although online learning has been instrumental in continuing delivery of education during the pandemic school closures, the limitation of ICT infrastructure has proven to be the main challenge for the Cambodian government to expand its coverage and access to online learning for students in rural areas. Implications are that greater internet coverage and equitable availability of technology resources in remote communities should be considered by the government in the post-COVID-19 era to ensure the education system is prepared for the future needs of Cambodia's children.

DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and to the best of my knowledge and belief, does not contain any material previously published or written by another person except where due reference is made in the text.
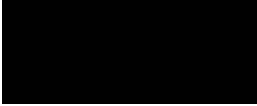
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LIST OF ABBREVIATIONS

ABBREVIATION	TERM
ADB	Asian Development Bank
ICT	Information and Communications Technology
ILO	International Labour Organisation
MoEYS	Ministry of Education Youth and Sports
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
TV	Television
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNTAC	United Nations Transitional Authority in Cambodia
U.S.A	United States of America

CHAPTER 1. INTRODUCTION

1.1   Background

The novel coronavirus disease (nCOV), which emerged in Wuhan City, Hubei province in China in December 2019 (Lu, Stratton & Tang 2020) and was later named COVID-19 by the World Health Organization (WHO), is highly contagious and spread through droplets of saliva when an infected individual coughs or sneezes (WHO 2020a). The WHO declared the outbreak a global emergency on January 30, 2020, and subsequently categorised it as a global pandemic on March 11, 2020, followed by issuing a series of policies and recommendations for all countries around the world to take action (Sohrabi et al. 2020; WHO 2020b). By June 17, 2020, the virus had spread across 215 countries, infected 8,264,309 people, and resulted in the deaths of 446,134 patients (Worldometer 2020b). The COVID-19 pandemic is now regarded as one of the most serious global health crises in the history of humankind.

To limit and contain the spread of COVID-19, some countries shut down borders, imposed travel restrictions, and required self-quarantine and social distancing of citizens (*Al Jazeera* 2020; Nicola et al. 2020; Sahu 2020), while others took additional non-pharmaceutical interventions, such as limiting large gatherings, and closing gyms, movie theatres, and schools (Sahu 2020). As a result, the pandemic has adversely affected businesses, labour markets, and economies worldwide. The global pandemic has also negatively affected the education sector, especially in developing countries. This problem has come about because of the increasing gap of global education inequality between developed nations and the developing world. In developed countries, relatively wealthy governments and communities have been able to adapt education programs to overcome the worst effects of the pandemic on young people. Whereas, in developing nations, governments have had fewer resources and there are more vulnerable populations of young people experiencing poverty and socio-economic disadvantage (United Nations 2020). Consequently, many developing countries have struggled to adapt to the educational requirements forced upon them by the pandemic. The data from a review in March 2021 by the United Nations Educational, Scientific and Cultural Organization (UNESCO) showed that COVID-19 caused 125 countries to close down schools worldwide which affected more than 1.1 billion learners due to the shutdown of education institutions (UNESCO 2020b). Closing schools for long periods disrupts students' peer and teacher networks. This affects the achievement of students (Brummet 2014). As a result, many governments decided to move all education courses to online

aiming to keep students engaged with their education, peers, and teachers, as well as to limit the spread of the virus (Basilaia & Kvavadze 2020; Duffy 2020; Naciri et al. 2020).

The Kingdom of Cambodia (Cambodia) is among the countries affected by the pandemic in terms of disruption to health, economic and educational programs. The first confirmed case of COVID-19 was discovered on January 7, 2020 in a resident in Sihanoukville Province, and as of April 6, 2021 the country had 2,752 confirmed cases which had resulted in 21 deaths (*Channelnews Asia* 2020; Worldometer 2021). To contain the virus and limit the spread, the Cambodian government has taken action by closing entertainment clubs, some shopping centres, cinemas, schools, and universities (*Cambodianess* 2020; Narim 2020; Xinhua 2020a). More importantly, clinical interventions have been made in reacting to the spread of the infection. Each time a new case is reported, contact tracing is done which requires any affected businesses to close or individuals to self-isolate to prevent the spread of the infection. Furthermore, the Cambodian government presented the Anti-COVID-19 Law on March 11, 2021 and on March 20, 2021, the Ministry of Education, Youth and Sports (MoEYS) issued a declaration to temporarily close all schools throughout the country and required all schools to adopt online teaching as an alternative approach to assure the continuation of education during school closures. Online tutorials for all general education from grade 1 to 12 are uploaded on different platforms, including TV, Facebook page, YouTube channel, and the E-learning website (MoEYS 2020c).

To embrace rapid progress of Information, Telecommunication and Communication (ITC) and to provide complementary access to ongoing education for students, the Cambodian government has created various types of online learning platforms. For example, a new TV channel was created exclusively for broadcasting the tutorials with an additional broadcasting schedule in cooperation with an existing TV Khmer channel. Also, recorded teaching videos are posted on MoEYS Facebook page, YouTube channel, and E-learning website. It is evident that the online learning in Cambodia has intensified but what is not clear is the effectiveness of the specific features, as well as the strengths and weaknesses of the online learning. For example, broadcasting tutorials on TV channels requires television to access the tutorial, and online teaching through Facebook and YouTube require internet, computers or smartphones to access the materials. Although online teaching has become a widespread trend in many countries, it is not certain to what extent online teaching fits Cambodia's socio-economic context in which many people have limited access to internet, electricity supply, or to technology necessary to engage with the online platforms (Poch & Tuy 2012). In the case of rural Cambodians, in particular, many families have no TV, computer or

provision to take advantage of the government's online learning programs. Therefore, this study examines the responses of the Cambodian government to the need for the continuation of education through the provision of online teaching during the global pandemic, and assess the strengths and limitations of each response.

1.2   Research Question

The primary research questions this research answers are:

1. How has the Cambodian government assure the continuation of education in Cambodia during the COVID-19 pandemic?
2. What are the strengths and limitations of the educational approach the Cambodian government has used to respond to student needs during the global pandemic?

1.3   Scope of the Research

The scope of this study is the access to education in Cambodia during the COVID-19 global pandemic. The scope of this study is limited to public schools from grade 1 to grade 12 nationwide. In addition, this research will only consider the access to education by these educational institutions in the form of online learning. This research will only select the data of online learning from MoEYS' Facebook page, YouTube Channel, and MoEYS' e-learning website from March 2020 to March 2021 timeframe.

1.4   Method of the Research

This qualitative research paper is based on secondary data (Creswell & Creswell 2017; Crotty 1998) from documents and policies issued by MoEYS (2020a, 2020b, 2020c) related to responses of the Cambodian government on education during the global pandemic. In addition, sources have been utilised from peer-reviewed academic journals and publications, particularly articles related to the global response on a continuation of education during the pandemic by countries around the world. Due to the limitation of peer-reviewed data from Cambodia and some other countries, this paper also utilises data from grey literature as well as the reports from the World Bank, Asian Development Bank (ADB), non-government organisations (NGOs), and local and international newspapers (Cohen, Manion, & Morrison 2011).

This paper focuses on evaluating the effectiveness of online teaching through the social media approach by the Cambodian government. The number of views on each video on Facebook

channel, and YouTube channel were used to analyse and compare data against the number of school children in Cambodia. The data of the number of enrolled students from grade 1 to grade 12 for general education were retrieved from the MoEYS' (2020a) website. The number of internet users, Smartphone users, and computer users were retrieved from the website of the Ministry of Post and Telecommunication of Cambodia (2020). Moreover, the data on electricity availability was retrieved from Electricity of Cambodia's website. The research project also utilised data from grey literature, such as website articles related to objectives of the study.

1.5   Objectives of the Research

The overall aim of this research was to understand the Cambodian government's approach and response to ensure continuous education for students during the Covid-19 global pandemic. The study sets out two specific objectives:

1) To evaluate the access to online learning platforms and other educational initiatives by the Cambodia government in response to learning disruption caused by the COVID-19.
2) To assess strengths and weaknesses of those online learning platforms.

1.6   Limitations of the Research

The analysis in this research paper is based on secondary data. The researcher is based in South Australia and has therefore relied to a large extent on the data available on the internet and from the literature for this research. The limitations of Cambodian government data available on the internet, such as the number of internet users, computer users, and Smartphone users, has presented a significant challenge. However, the researcher has utilised the data available from Cambodian government sources, in conjunction with academic literature related to online education, and has supplemented that information with less formal sources in the grey literature, such as non-government reports and local newspaper articles. Wherever possible, information from sources has been checked and cross-referenced to determine accuracy and reliability.

1.7   Research Significance

Online study for education has been widely adopted by many developed and developing countries as a means of expanding opportunities for learning and academic achievement (Appana 2008). Therefore, the decision to provide online learning for Cambodian general education students during the pandemic was not an entirely new concept. However, providing formal education from

a national curriculum by using social media platforms was indeed a significant development in the Cambodian context. More broadly, there has been limited academic research published in the international development literature on the effectiveness of online teaching using the mode of social media platforms (Al-Samarrai 2006; Appleton, Morgan & Sives 2006; Brownson 2014; Friedman & Friedman 2013; Khan & Ghadially 2010; Mbodila, Ndebele & Muhandji 2014; Porter et al. 2016). Moreover, there have been few published studies on the strengths and limitation of the approach that the Cambodian government has adopted to respond on general education during this global pandemic. Therefore, this study makes a significant contribution to knowledge and helps to fill a gap in the academic discourse on Cambodia's response to online education during the pandemic.

This research will contribute to the growing body of academic literature related to the education response to the pandemic globally by using the context of Cambodia as a case study. The outcomes of this research will contribute to promote greater understanding of the potential for improved education through the form of 'online learning' or 'distance learning' in developing countries, such as Cambodia, that have limited resources. This research can also raise an awareness of the value of online learning for the future in developing countries and will serve as a resource for the policymakers in Cambodia's education sector to better understand which methods have worked well in the current pandemic. Importantly, it will provide guidance on what aspects need to be revisited in the event of the need for future responses, preparedness, and decision-making on education programs should a similar pandemic emerge again in the future.

1.8   Structure of the Thesis

This thesis is organised as follows. Chapter 2 Global Pandemic and Online Education provides an overview of how the COVID-19 global pandemic has impacted the education sector worldwide. It also presents a relevant discussion on the benefits and challenges of online education, and how several developing countries have provided online learning during the global pandemic. The last section in this chapter identifies the research gap and how this research fits into general literature. The main findings from this chapter suggest that governments in developing countries have adopted different approaches and forms of education response during the pandemic depending on available communication resources. However, each government has had a similar objective to ensure the ongoing learning for students in their countries. This research has identified that, among the approaches examined, TV has been the most popular mode of education delivery.

Chapter 3 Global Pandemic and Cambodian Government discusses the details of how the Cambodian government has responded to provide continued education during the global pandemic. It begins with the historical context of education in Cambodia, followed by education policy, teachers' ICT knowledge, online teaching platforms, teachers' roles during this time of crisis, and the parents' role for home teaching. This chapter concludes that among the four platforms analysed, Facebook has received more interest from students, especially for those who have access to internet and computer or Smartphone devices. On the other hand, TV has been shown to be more beneficial for those students living in rural and remote areas where internet is unreliable or unavailable.

Chapter 4 Assessing Cambodian Government Response Measure analyses Cambodia's online teaching platforms with emphasis on challenges and opportunities for online teaching during the pandemic. The evidence from the analysis indicates that, in Cambodia, Facebook has an important role in delivering education during the pandemic due to the popularity and public's acceptance of this application. Furthermore, the result shows that using social media as a tool for education delivery is likely an effective approach if combined with other platforms such as TV and E-learning websites. While this study's findings are consistent with a number of scholarly works in the literature that ICT is critical for online and distance education, the result also suggests that employing independent platforms, such as a self-managed E-learning website, would potentially minimise the risk of education delivery disruption.

Chapter 5 Conclusion: Discussion and The Way Forward presents an overall conclusion of the online learning in Cambodia during the global pandemic, including the strengths and limitation, which is then followed by the recommendations of best practice from the academic literature. The chapter concludes with recommendations for further research.

CHAPTER 2. GLOBAL PANDEMIC AND ONLINE EDUCATION

2.1   Introduction

This chapter draws from the review of academic literature related to online education and the approach for education response from different developing countries during the global pandemic. It gives the overview of how COVID-19 has impacted education worldwide, followed by the highlights of strengths and limitations of online learning from the experience of several developing countries that delivered online learning during the pandemic.

2.2   Global Pandemic 2020 and its Impacts on Education

The COVID-19 pandemic has evolved as a severe global crisis with effects rippling beyond public health and economy to include disruption of education, food systems and labour markets (ILO et al. 2020). As of November 8, 2020, 5.3 million people have been infected resulting in 1.25 million death globally (Worldometer 2020a). The joint statement by ILO, FAO, IFAD and WHO (2020) reported that this pandemic has put tens of millions of people at risk of falling into extreme poverty and has pushed the level of undernourished in the world population to nearly 690 million .

Due to the contagiousness of COVID-19, many countries have moved to close schools to prevent community spread. As a result, the COVID-19 pandemic has caused the largest disruption of education systems in history, leaving nearly 1.6 billion learners out of schools in more than 190 countries globally (United Nations 2020). It is reported that the closures of schools and other learning institutions have caused negative impacts to more than 94 per cent of the student population worldwide and up to 99 per cent of them are in low and lower-middle income countries (United Nations 2020). This pandemic has expanded the gap of education inequality by reducing the opportunities for vulnerable populations to continue their education, both children and youths, in developed, developing, and under-developed nations worldwide (United Nations 2020). The United Nations estimates that the COVID-19 pandemic will add an additional 23.8 million children and youth to the current population of school dropouts or those unable to access education in 2021 due to the economic impact of the pandemic alone, which could have long term negative impacts on their lives.

To bridge the gap of education inequality during this global pandemic and to provide education to their citizens, many countries have introduced distance learning platforms ranging from radio to television to internet based online learning. Distance learning is defined as a method of study that enables teachers and students to use the Internet or other electronic communication methods instead of meeting in a classroom (UNESCO 2020). International organisations such as UNESCO

have been playing a critical role in promoting education continuity during this global crisis by partnering with Global Education Coalition to develop distance learning tools as well as providing financial and technical assistance to many nations globally (United Nations 2020).

2.3   Online Education and Education During a Global Pandemic

2.3.1   Online Education

Online education is not new but has been widely and increasingly embraced by educators over the past several decades. It first emerged in 1989 when the University of Phoenix started using the first consumer online services, and the birth of the World Wide Web in 1991 had enabled the University of Phoenix to become one of the first online education programs providers through the Internet (Kentnor 2015, p. 28). The successful delivery of online education by the University of Phoenix has brought online education market opportunity to prominence which led to the adoption of the Internet platform by many reputable educational institutions (Carlson & Carnevale 2001, cited in Kentnor 2015). Nowadays, online education in one form or another has been adopted in the majority of educational institutions in the world.

Online learning refers to the virtual learning environment that students and teachers use in communication and interaction which is bridged with the help of information and communication technologies (Wan, Wang & Haggerty 2008, p. 513). It mainly relies on the presence of computers, internet connectivity, and web-based technologies (Sun et al. 2008, p. 1184). In other words, online learning is entirely dependent on the internet and delivery through the internet. Similarly, Allen and Seaman (2008, p. 4) define online learning as the way of delivery of education from a distance using computers and the internet as the delivery mechanism in which at least 80 per cent of the course content is delivered online. In the literature, several terminologies has been used interchangeably for online learning and they include, among others, computer-based training, online education, virtual learning, internet-based training, and e-learning (Rao 2011, p. 129). Table 1 provides definitions and descriptions of the range of education course content delivery from the traditional method, to web-facilitated, to blended, and finally to online delivery of learning that typically has little or no classroom interaction between teachers and students.

Table 1: Definitions of online learning courses

Proportion of Content Delivered Online	Type of Course	Typical Description
0%	Traditional	Course with no online technology used – content is delivered in writing or orally.
1 – 29%	Web Facilitated	Course that uses web-based technology to facilitate what is essentially a face-to-face course. May use a course management system (CMS) or web pages to post to post a syllabus and assignments.
30 – 79%	Blended/Hybrid	Course that blends online and face-to-face delivery. Substantial proportion of the content is delivered online, typically uses online discussions, and typically has a reduce number of face-to-face meetings.
80+%	Online	A course where most or all of the content is delivered online. Typically have no face-to-face meetings.

Source: Allen and Seaman (2008)

Online learning has been widely used to increase access to education and promote education equality. Via several learning platforms, it allows students to be more flexible to access their learning materials, depending on individual educational institutions, where students would be able to attend the pre-scheduled online lectures, tutorials, presentations, or any kind of discussion board or interact with their peers and educators at the same time as the sessions happen synchronously (Heng & Sol 2020, p. 3; Offir, Lev & Bezalel 2008). In some cases, students can access the pre-recorded materials, such as lectures, presentations, assignments, reading materials, and discussion forums asynchronously (self-paced), depending on the online learning platform provided by individual educational institutions (Offir, Lev & Bezalel 2008).

While developed countries have more resources and modern technologies to deliver e-learning, their online teaching delivery is usually more effective and the quality of online education is usually more acceptable (Naresh & Reddy 2015, pp. 259-60). In contrast, e-learning delivery in developing countries often faces some difficulties due to limited resources and modern technology (Zoroja, Skok & Bach 2016, p. 9). Despite relatively poor ICT infrastructure, a number of developing countries have applied the e-learning mode to deal with their institution education challenges. For example, in Botswana, the online teaching was designed to deal with a rapid increase in university enrolment, large classrooms, and to maintain the quality of education program while the number of academic staff is limited (Ikpe 2011). Online learning can handle the maximum number of participants from different geographical locations compared to conventional

teaching, where the number of students is limited due to the size of the classroom and student-teacher ratio.

Online learning is also the primary means for educational providers to expand the geographic reach. The survey of 2,577 institutions in U.S. by Allen and Seaman (2008) found that three-quarters of all types of institutions, Carnegie Classifications, and size of institutions agree or strongly agree that online education could expand the geographic reach of their institutions. Likewise, in Pakistan, the government has promoted online education as 'education for all' from basic literacy to higher education to reach more students, especially those who live far from the cities and have difficulty affording the traditional higher education (Iqbal & Ahmad 2010). Beldagli and Adiguzel (2010, p. 5756) point out that the leading players in conventional teaching and online teaching are the same 'the teacher, the content and the student', but the primary constraint in conventional teaching is 'place and time'. Consequently, the online learning is introduced to solve the problem of 'place and time' by applying web-based learning environment which allows students to acquire knowledge anywhere at any time (Amaral & Leal 2006). With the presence of e-learning, any individual has a significant advantage of access to education at any given time of the day regardless of where they are. Also, Adams (2008, p. 577) asserts that online learning requires extensive use of computer technology which in turn contributes to an increase in computer literacy of students who will have more advantage when applying for employment.

Online learning has been proven as an effective platform for students who prefer a self-regulated learning environment (You & Kang 2014) because it allows student to review materials more than once and the ability to study at their own pace (Kirtman 2009, p. 110). Self-regulated learning is defined as 'an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features of the environment' (Pintrich 2000, p. 453). The study conducted by Kirtman (2009) found that the self-regulated students prefer taking online courses because they have more control on the particular contents that they are interested. For example, when asked about 'What are the advantages of having class online? In addition to issues such as convenience, think about how it impacts your learning.', most students acknowledged having to be more responsible for their own learning and the ability to review material again and again on the online platform (Kirtman 2009, p. 110).

Self-regulated learners tend to manage their 'time, effort, and physical learning environment' carefully to maximise their performance to accomplishing their goals by utilizing their 'cognitive and metacognitive strategies' (You & Kang 2014, p. 126). Self-regulated students are usually very active and engaged in their study. Hence, the online study proves to be a very good learning environment for them. In addition, the survey result from Kirtman (2009, p. 110) claims that many students have improved their grades from watching the online tutorial sessions more than once, and they also ask their teachers more questions about the lessons. Moreover, the online learning enable students to focus more on their learning materials since they do not worry about travelling time to school, fuel and vehicle costs, and parking when attending traditional classrooms (Kirtman 2009, p. 110).

Online learning increases students' competence and develops students' autonomy in learning. The results from the survey of 118 students conducted by Wong (2020, p. 8) found that online learning could help students to learn 'deeper and broader' which contributes to develop their 'self-confidence and sense of competence in learning'. Moreover, students develop the autonomy from accessing an online learning course as it gives them more freedom, more space, more flexibility, and more liberation from the control of their teachers, especially when it comes to when and how they complete their assignments (Wong 2020, p. 7).

Wong (2020) finding aligns with the claims of Suzuki (2013) that online learning develops students' autonomy which contributes to building their sense of authenticity: 'a channel to express their voices, promote their self-images, and legitimise their goals' (Blake 2013, p. 4). From this research, it is obvious that the majority of students in these studies prefer taking online courses because they need more freedom to do their assignments and study at their own pace without restriction from the controlled environment experienced in face-to-face classrooms. This flexible environment of online learning enables them to be more focused, more independent, which results in making them more confident.

While numerous studies have suggested the benefits of online education, there are also limitations to online education. Zoroja, Skok and Bach (2016, p. 10) acknowledge the importance of online teaching but suggest that the implementation of e-learning in developing countries requires significant support from education institutions both in the form of time, trust, and finance. The authors found that the main obstacles in online education can be the slow speed of the internet, the lack of having a computer at home, and lack of resources of academic staff, such

as training and access to advanced technology (Zoroja, Skok & Bach 2016, p. 9). In addition, students who are addicted to the internet and technology will likely spend more time on social media than the actual time on e-learning materials (Zoroja, Skok & Bach 2016, p. 9). Thus, some students studying online may experience difficulty with self-motivation and staying focussed on learning rather than computer games or other peripheral activities online. The professors who use more advanced tools and support from the institution are willing to continue to use the e-learning in the future, but for those who have a bad experience in online teaching software and lack support may not use online teaching again in the future (Zoroja, Skok & Bach 2016, p. 15). Similarly, Katsikas et al. (2006) suggest a very similar result related to the challenge of accepting e-learning. Their study in three universities – private, public, and government-owned universities – in Nigeria found that the low level of computer literacy, low level of e-learning awareness, poor internet services, and low quality of software were the critical challenges to the acceptability of online teaching technology (Katsikas et al. 2006).

With the adoption of online learning, individuals must have computer literacy, and having access to a computer with a stable internet connection, or ownership of computers is equally important. A number of studies have focused on computer literacy as it is the main requirement to adopt online learning. The survey on 'Computer literacy and E-learning perception in Cameroon' conducted by Bediang et al. (2013, p. 3) found that 17 per cent of students did not have a computer at home, and 49 per cent of students were forced to access the internet via cybercafé. Students had access to a computer at home but relied on the cybercafé for internet access. This issue of access to technological resources presents a challenge to catch up with the online learning environment. Surprisingly, the same research also found that more than half of the students in the research sample were not familiar with the online learning platform, and 84 per cent of them had never accessed online learning materials before (Bediang et al. 2013, p. 3). When students are not familiar with the platform because they have never been exposed to it before, it poses significant challenges for students to adapt to the learning which affects the learning outcomes significantly. Students' familiarity with online learning platforms is a very important starting point when introducing online learning mode to ensure the productivity of students' learning.

Similar results from a study in Jordan by Akhu-Zaheya et al. (2013, p. 43) found that a majority of students reported that they only use computers for word processing, email, and surfing the internet, but do not use computer for data analysis or any education tutorial. Almost 90 per cent of the students responded that they do not need to use the computer both at home and at work.

Moreover, 83 per cent of students do not have a computer at home (Akhu-Zaheya et al. 2013, p. 43). Experience in word processing, email, and internet surfing applications is an important computer literacy skill for students to participate in online learning. However, without the knowledge of using data analysis software (e.g., Microsoft Excel), the students' potential to maximise their analytical and interpretational skills is limited. Moreover, for those who do not have computer at home and are not using computers at all both at home and at work, would experience more difficulty in adopting the online learning module. The less use of computers means the less proficiency of students in mastering computer programs which could potentially lead to computer illiteracy and negative impacts for learning outcomes. These problems found in studies of students in Nigeria, Cameroon, and Jordan illustrate the typical weaknesses experienced with implementing online learning in developing countries. These conditions are similar to those found in Cambodia during this research.

Some studies suggest that online learning cannot provide the basic needs for students in terms of 'relatedness'. Wong (2020, p. 2) defines 'relatedness' as 'an individual's desire and need to connect and create a bond with people'. Students undertaking online learning through their smart devices or computers from their room, library, or at the internet cafe, do not have physical interaction with their peers but via online only which results in students using and developing fewer interpersonal skills. A study conducted by Wong (2020, pp. 8-9) found that the online learning does not provide the basic need for students in terms of 'relatedness' and 'arousal' due to the nature of the online learning environment which brings students from different locations to meet virtually only. Spending more time on computer screens and less human interaction has an effect of making the students feel less interactive with their peers physically and contributes to isolation and reluctance to associate with people in face-to-face situations.

The available of technology in online learning has enabled students to stay connected with their friends not matter where they are (Pintrich 2000, p. 453; You & Kang 2014). Nevertheless, the students have lost the opportunity to have direct contact with their friends in the form of human interaction, because what connects students is the internet rather than the structured boundaries of the class or school (Wong 2020, p. 9). Meeting their peers online for a prolonged period could make the students lose their interest in developing relationships or finding friends with whom they can interact (Wong 2020, p. 9). Hence, over time, they may feel more isolated (Koutsoupidou 2014, p. 252), which affects their communication and inter-personal skills in the future.

Online learning does not provide students the basic need of 'arousal' which Wong (2020, p. 2) defines as 'in psychology, a state of being psychologically attentive and alert which is controlled by the reticular activating system in the brain'. Students have different needs depending on the cognitive ability. For those who are self-regulated students, the online learning might be their favourite because they can maximise the benefits of it to achieve their goals. On the contrary, for those students who are less self-regulated, they might need more support. Jacob and Radhai (2016) assert that students have different backgrounds and knowledge, so they need extra support in terms of motivation and self-discipline to help them more successfully form the participation of online learning. The quantitative and qualitative data from Wong (2020, p. 9) study suggest that online learning is not a suitable platform to bring the basic needs of 'arousal' for students since it does not make the students feel motivated and sustain their attention. This outcome arises because online learning involves less supervision from teachers which makes students feel that learning is their responsibility alone. Wong (2020, p. 9) notes that the survey results showed the three main reasons for failure of online learning to achieve its goals were 'lack of incentive', 'poor concentration span' and 'perceiving learning as responsibility'.

This finding is similar to the research by Doughty and Long (2003, p. 67) on psycholinguistic environments for distance learning stating that the students feel discouraged to take online courses dues to the non-presence of the teachers to give them immediate feedback on their tasks, which causes them to feel more lonely, overwhelmed, and frustrated (Hara & Kling 1999).

Students undertaking online degrees would potentially face the negative judgement and discrimination from their potential employers when applying for jobs after graduation. Adams (2008, p. 576) study examined the 'Factors limiting the acceptability of online courses and degrees' found that online education has negative impacts on individuals' job application acceptability when competing for employment due to the employers' perception of online education as 'missing key elements' compared to conventional education. Hence, employers commonly judge online graduates as not having the same qualifications as those who graduate with degrees in the residential program. The result from a national survey on hiring practice puts more weight on the claim by Adams (2008) since it found that only 6 per cent of employers in the health care sector would accept applicants with an online degree (Adams, Defleur & Heald 2007). Moreover, only 15 per cent would accept those who have half of the courses studied online while the majority of employers still have the perception of face-to-face education as the 'quality' education (Adams, Defleur & Heald 2007).

Adams, Defleur and Heald (2007, p. 304) imply that even though students may have computer literacy, sufficient resources such as computer, internet, and tutoring materials, online learning is not very practical in some cases. For example, in medical education students are required to have 'face-to-face interaction, clinical fieldwork, and mentored experience' to be seen as a complete practice to get medical qualification. These skills and experience are often seen as the missing factor that affects the quality of education and negatively impacts the students' employment opportunities. Therefore, acknowledging the quality of online education versus traditional classroom mode and offering the graduates with the same employment opportunities would be an important factor to encourage more students and educational institutions to adopt online learning platforms.

The online learning method can be seen to have both advantages and disadvantages; however, increasing demands placed on education institutions, due to limited staff, can be met through online learning. Governments in particular can increase the geographic reach of public educational institutions, making education more reachable and affordable for the population, and improving equity and national literacy and numeracy standards (Ikpe 2011). Online learning has been seen as an effective means of teaching for self-regulated students, for increasing students' competence and autonomy, and for bringing students and teachers to meet virtually regardless of their locations (Pintrich 2000, p. 453; You & Kang 2014).

This assessment of the benefits does not mean online education could replace the traditional classroom form of face-to-face education. As mentioned in the literature, it must be acknowledged that to make online learning possible, there are numerous requirements to be met, including the human resources and financial resources to enable teaching professionals to deliver online schooling and to enable students to access those services in an effective and equitable way (Allen & Seaman 2008; Sun et al. 2008, p. 1184). In particular, the electronic devices necessary for online learning and internet connectivity are basic essentials. Therefore, online learning has proven to be challenging for those who have no access to a computer, limited knowledge of how to use computer education applications, and no internet connection. Teacher and student familiarity with the online learning platforms and environment is necessary to make their learning experience productive. Online learning is quite challenging for students who are less self-regulated and who require more support from their teachers, especially for direct and immediate feedback opportunity (You & Kang 2014). The non-copresence of the teachers with students creates feelings of loneliness and isolation, a sense of being overwhelmed by their tasks, and the perception that

learning is their sole responsibility, which negatively affects their performance. Moreover, online learning does not enable students to have human interaction which could affect the development of their inter-personal skills in the longer term. Some academic skills that students need to learn require a blended learning environment incorporating both online and face-to-face components because the skill require hands-on practice, such as in medical studies (Adams, Defleur & Heald 2007, p. 304). In this case, the combination between online learning and face-to-face learning must be managed to enable effective outcomes for students. Hence, online studies alone cannot prepare students for careers in some professions where direct practical experience is an essential part of the learning and qualification process.

In summary, while there are clear advantages of online learning which can be said to outweigh the disadvantages, online learning cannot entirely replace traditional classrooms. Despite that, the online method can be useful to complement classrooms and to make the learning experience more productive, while helping to bridge the gap of education inequality globally. The emergence of the COVID-19 pandemic, has emphasised the importance of the online learning platform in education delivery. Many countries have moved their education online by adopting different platforms and tools which have been available in their respective countries (George 2020; Kertbundit 2020; Malik 2020; Uzair 2020; Yunus, Abubakar & Abudu 2020). Thus, the following section draws on the literature review to identify and explain how online learning has been used in different countries during the global pandemic as a tool for the continuation of education.

2.3.2 Online education during the global pandemic

The global pandemic has caused significant disruption in the education sector (UNESCO 2020b). Education in developing countries are affected relatively more severely by COVID-19 due to limited resources and limited technology available.

Online learning tools and platforms vary from country to country according to available resources and technology. Developed countries tend to pay for premium services that require the latest technology and good internet speed for their distance learning platforms. Many countries have utilised commonly available membership fee-based platforms, such as Zoom or Skype for business, or Collaborate, which are more secure, but require good internet speed. Developing countries, however, tend to use free services such as Facebook live, TV channel for broadcasting, YouTube, WhatsApp, Moodle, Google hangout, and others that have emerged to fill this requirement for cost effective approaches to online communication. All of these free or even premium online

communication services have particular advantages and disadvantages in terms of the distance learning effectiveness as it varies from country to country. As the COVID-19 pandemic has only been affecting education programs for the past 12-18 months, since it emerged in December 2019, there has been limited research on the effectiveness of online learning during school closures, particularly in developing countries which have had even less opportunity to examine this phenomenon. Few studies have evaluated the effectiveness, benefits, and challenges of distance learning in Cambodia during the global pandemic. Therefore, examining research in other countries has provided useful learning experiences that may be useful in applying policies to the Cambodian context.

In Pakistan, television has been employed as a distance learning tool for delivering education during the COVID-19 pandemic (Tranringrose 2020). The educational channel air content from kindergarten through high school levels, and each grade has one hour of curriculum per day (George 2020). Television in Pakistan formerly did not have an education channel, and this initiative was introduced specifically because of the pandemic-related school closures. With limited internet access nationwide, only 36 per cent of households in Pakistan subscribed to broadband Internet access (Pakistan Telecommunication Authority 2019), and even fewer, only 15.5 per cent of the population, used the Internet in 2017 (The World Bank 2017). For that reason, using a television channel for education was the most appropriate solution because 62.5 per cent of the population had a television at home according to Demographic and Health Surveys 2017 (Malik 2020). However, even with the effort from the Pakistan government to deal with education inequality, some saw that the government schools had ignored additional support for government-school children by allowing them to study at home alone without any guidance or extra materials compared to private-school students that they were given extra materials and guidance for home-learning (George 2020). Therefore, teaching children at home during the pandemic has been the sole responsibility of parents. Also, there has been critical assessment on the quality of content on the television program which claims that some content is incomprehensible and too fast-paced (George 2020) which presents a challenge for children to learn. Responding to the criticism, Pakistan's education minister Shafqat Mahmood acknowledged that the content is not perfect, but it is the only possible option that the Pakistan government could choose to support continuous learning. In addition, Pakistan's education minister views the television program as very successful, referencing the positive feedback from parents and teachers

regarding the program, but he acknowledged that the traditional classroom is irreplaceable (George 2020).

Distance learning by using television to air educational content has also been adopted by the Indonesian government. Like Pakistan, the Indonesian government also uses television channels to broadcast the education materials aiming to bridge the gap of continuous learning during the pandemic. However, the content in Indonesia is different from Pakistan. In Pakistan, the Ministry of Education created the content, while in Indonesia, the content is owned by Netflix – a membership-based movie streaming service – through a partnership agreement (Uzair 2020). Instead of using an online platform that requires internet access, Indonesia's government airs the education materials from Netflix through an Indonesian public television channel giving free access to anyone who has a television at home without needing internet access to view the program. The content includes award-winning films, television series for children and families, while documentaries are aired every Saturday, Sunday and Wednesday (Bona 2020). The Netflix learning documentaries include 'Our Planet, Street Food: Asia, Tidying Up With Marie Kondo, Spelling the Dream, Chasing Coral and Night on Earth' (Bona 2020). The decision of the education minister to partner with Netflix on airing documentaries has attracted criticism from members of Indonesia's House of Representatives due to the ethical concerns, but not about the quality of the content. Rather, the government was condemned for supporting foreign business instead of promoting local businesses, even though this partnership between the Indonesian government and Netflix has been free of charge (Loasana & Wira 2020).

One reason for choosing to air education content on television is because that method could reach more audiences, since about 91.5 per cent of the Indonesian population watch television (Eriyanto & Mutmainnah 2020). This approach could allow millions of children to learn from the program from their home. However, some concerns are that Netflix would promote binge-watching that leads to a serious health issue. Matrix (2014, p. 124) claims that allowing children to access on-demand programs on Netflix indirectly encourages them to practice binge-watching and ignore their social life, causing negative health effects, such as obesity. There has been a claim that online movie streaming services have targeted children through their television episodes. For example, 65 per cent of most replayed television shows are for children, as Matrix (2014, p. 122) found, which is reflecting that children could watch the same episode again and again endlessly. While some see the dark side of Netflix, others view it differently. The study conducted by Hashish, Bunt and Young (2014) suggests that allowing children to access controlled content for educational

purpose with parents' help has a positive effect on children's learning outcome. It promotes good learning habits, safe environment, and strengthens the relationship between parents and children (Hashish, Bunt & Young 2014). This claim is supported by Netflix's practice in Indonesia of programming only content suitable for young people that the government strictly controls as the main aim is for educational purposes only. In this case, children do not have access to the entire Netflix content as do paid subscribers (Bona 2020). Based on the findings of Hashish, Bunt and Young (2014), the Indonesian government's approach in using Netflix for education purposes contributes to students' learning, strengthens family relationship, and maintains safe standards preventing inappropriate content.

Nigerian secondary schools have used various online tools for online learning during the pandemic. The study conducted by Yunus, Abubakar and Abudu (2020, p. 93) on the online learning effectiveness in Nigerian secondary schools found that in Nigerian secondary schools students adopt different online tools, including Google, Decebo, Adobe, and Class-captive for learning. In their study, the sample of 460 senior secondary schools students in four different schools in Nigeria mentioned that these online tools were very helpful for them to study from home during the lockdown, especially the RCampus application that allowed them to access learning discussion, education materials, submit assignments, and view video tutorials (Yunus, Abubakar & Abudu 2020, p. 93). At the same time, students feel that being exposed to online learning during the lockdown has made them academically and socially integrated well. However, a similar study conducted by Stephen and Omonyemen (2020, pp. 113, 5) claimed that the online teaching in Nigerian secondary schools was not effective because the students were not comfortable in using online learning platforms and they still want to go back to conventional classroom. The result of the survey found that the majority of students often do not use online methods of learning while they are at home due to lack of access to internet, unavailable ICT equipment. They also reported that not seeing their teachers in conventional classrooms was having a negative impact on learning resulting in loss of knowledge and poor academic performance (Stephen & Omonyemen 2020, pp. 113, 5). In addition, more than 60 per cent of Nigerians do not have access to internet and, while a mobile phone is a good tool for access to online education, only 83 per cent of 169.2 million Nigerians have access to a mobile phone connection, yet 50 per cent of them reside in the urban area (Datareportal 2020). This lack of connectivity presents the main challenge for online learning in Nigeria's secondary schools leading to poor academic performance of secondary schools students.

Thailand, on the other hand, has adopted three modes of distance learning during the pandemic: television, on-demand resources via the digital education excellence platform (Deep), and interactive online education (Kertbundit 2020). The three modes of distance learning target different student levels. The kindergarten level mainly study on television programs, while primary and lower secondary school students learn by using Deep, and the senior secondary students learn through all the three channels of instruction (Kertbundit 2020). The Ministry of Education in Thailand announced that there are 17 television channels used to air educational content nationwide for distance learning (Techakitteranun 2020). The government's approach to keep the education sector running during this lockdown has raised some concern due the technical challenges that prevent online learning to run effectively. Engaging in distance learning from home poses challenges for students due to the lack of support for their study environment, as data from OECD 2018 showed that more than 30 per cent of 15-year-old Thai students lack of supportive study environment at home (Kertbundit 2020). This problem negatively affects the quality of their education during the lockdown. A survey of 678 school teachers across Thailand by Dhurakij Pundit University showed that only 58 per cent of school teachers are sufficiently trained and skilled to teach online class while only 45 per cent of students were prepared for e-learning (Thadphoothon 2020, p. 3). The majority of teachers responded that students would not be able to undertake online learning fully because 66 per cent of the students did not have access to computers, 57 per cent did not have home internet, and 36 per cent did not have Smartphones (Thadphoothon 2020, p. 3), which presents the main challenges in online learning.

In Vietnam, the government closed all schools and required all educational institutions to move the courses online. The official letter from Vietnamese Ministry of Education and Training adopts two forms of teaching: teaching via Internet, and teaching on television aiming to reach the largest geographical area possible (Ministry of Education and Training 2020). The immediate decision to move classrooms online created challenges for students and teachers, especially to adopt the technology with which they were not familiar. The study conducted by Dinh and Nguyen (2020, p. 1075) found that both teachers and students have difficulty adopting the online learning as they had no prior training or orientation with the utilised online learning/teaching applications, such as Zoom and Microsoft 365. Consequently, they had difficulties using them. The teachers were struggling to apply their teaching methodology and to transfer teaching materials from traditional classroom to online mode. Also, there were some technology issues, such as slow internet connection, loss of connection, low-quality sound, and other inadequacies making the online

session participation challenging for students and negatively affecting the quality of teaching (Dinh & Nguyen 2020, p. 1075). Unlike in some other developing countries, Vietnamese students were found to have better access to online learning, using Smartphones and laptop computers to access the learning materials, and almost all the students in the research sample reported they had internet access at their residence (Dinh & Nguyen 2020, p. 1077). The research concluded that students still preferred face-to-face teaching to online teaching. Through this new education policy, 110 out of 240 higher education institutions in Vietnam have adjusted from traditional education to distance teaching and learning (Cicha et al. 2021, p. 2), compared to the finding in 2016 when only 2 per cent (33,638) of total number of students from higher education nation-wide (1,581,227) were involved in the distance learning program (Pham & Ho 2020, p. 1328). Having experienced the online learning method over a period of time since the closure of classrooms has allowed the students and the teachers to become accustomed to the new learning platforms and to adapt to this new normal. Despite the rise of online education acceptance, the research by Hossain (2020) asserts that, in Vietnam, the poorer people have less benefits from online learning compared to the rich people due to the challenges of accessing technology and learning infrastructure and facilities, such as internet connectivity in the underprivileged communities. This problem illustrates how online education as it has emerged during the pandemic has introduced worsening conditions for lower socio-economic parts of communities and has caused a widening in the gap between literacy levels of the rich and the poor. Inequity has consequently been increased by the pandemic, and the basic human right to an education has been negatively impacted.

Australia has adopted slightly different approaches to deliver education during the pandemic by using a combination of the digital applications seen elsewhere, added to television, and including paper-based approaches. With the availability of technology and internet coverage almost nation-wide, most schools use digital platforms to deliver online learning sessions. The survey by the Victorian branch of the Australian Education Union identified that there are more than 25 digital platforms that primary school teachers in Victoria use to deliver online learning, but the most common platforms are WebEx (used by 66 per cent of teachers), YouTube (54 per cent), Epic! (47 per cent) and Google's G Suite for Education (44 per cent), and others that include Mathletics, Compass, Seesaw, Zoom and Facebook (Stock 2020). Even though Australia is a developed country, there are still up to 40 per cent of disadvantaged families not connected to the internet, whereas 90 per cent of advantaged houses are connected (Drane, Vernon & O'Shea 2020). The

national survey conducted by the University of Melbourne found that 49.45 per cent of teachers confirmed that all of their students had access to required devices for online learning and 43.28 per cent of teachers stated that most of their students had access to electronic devices (Ziebell et al. 2020, p. 4).

In addition, the internet connection in Australia still presents as a challenge since only 10 per cent of teachers mentioned that they have stable and reliable internet connection 100 per cent of the time for their classes, while 70.25 per cent of all teachers stated that stable and reliable internet was available to students 75 per cent of the time. Moreover, only 11.47 per cent of teachers asserted that students had stable and reliable internet 50 per cent of the time during the time that teaching sessions took place (Ziebell et al. 2020, p. 4). Having unstable internet connection or not possessing the necessary devices creates disruption to access the learning material. Therefore, the paper-based approach has been used in complement with technology aiming to help those students who have technological difficulties. For example, a school in Fairfield in the state of New South Wales where more than 30 per cent of families do not have internet and technology to access the online learning platform, teachers arranged paper books for their students which could be submitted using an online platform (Isles et al. 2021). Moreover, the teachers set up regular meetings with parents and guardians to ensure the families were supported and informed about the approach. This school embraced a simpler methodology that worked for their local community, as opposed to restricting the approach to a more innovation driven digital methodology that would have left behind a significant proportion of their students (Isles et al. 2021).

Providing online learning alone would pose significant risk of learning disruption for those who have no access to internet, especially for those in the disadvantage families, the government responds to the technology gap by delivering laptops and internet access point devices to students in disadvantages families. However, this response is not nation-wide but may only be applied in one school in New South Wales (Page et al. 2021). However, there may be other schools using the conventional paper and pencil approach which have not yet been studied or reported on in the available literature. Another conventional approach taken has been television which has also been used in some parts of the country to broadcast contents for those students having limited internet connection. The Queensland government uses television as a platform to broadcast educational contents for two hours a day for three days a week (Moore 2020). Therefore, it can be seen that even in a developed country, different approaches have been found to be necessary to ensure all students, particularly those in rural and remote areas, have access to education during this time of

crisis. Therefore, the survey conducted by Monash University suggests that the shifting to remote schooling in Australia during COVID-19 has been successful (Heffernan et al. 2020). However, the study at the University of Tasmania by Brown et al. (2020, p. 1) claims that almost half (46 per cent) of Australian children and young adults are at risk of negative effects on their educational outcomes by being physically detached from school. This claim appears to be confirmed by Ziebell et al. (2020, p. 4) who assert that the greater percentage of students across Australian rural primary and secondary schools did not attend online classes based on the schedule set by the schools. The result of the same survey found that 15 per cent of all teachers confirmed that their students *always* attended online classes, and 16 per cent of all primary and secondary teachers mentioned that their students attended online classes only *half the time* of their designated schedule (Ziebell et al. 2020, p. 4). As a developed country, Australia has very advanced technologies and resources that can be utilised for online learning delivery. With the support from the government, the community acceptance of online learning platforms has made online learning in Australia more acceptable. However, Australia still faces some challenges related to available technology and internet connectivity in regions outside urban environments and, thus, this has led some writers to point to inadequacies and inequities in the present systems of online learning during this time of crisis (Brown et al. 2020; Ziebell et al. 2020).

Literature concerning online learning in Cambodia during the COVID-19 pandemic is as yet very scarce. Heng and Sol (2020) is the latest research that discusses the challenges of Cambodia's online learning and concludes that factors that affect the effectiveness of online learning are not only poor technological infrastructure and capacity but also socio-economic conditions, teachers' lack of experience and heavy workloads, and aspects of the Cambodian culture. To make online learning in Cambodia more effective, Heng and Sol (2020, p. 11) suggest the Cambodian government work closely with educational institutions to increase more support and investment in developing and improving existing online learning platforms and expand the internet access and online library resources to more schools throughout the country. In addition, they recommend providing an orientation program and training for teachers and students about online learning which would make them more comfortable and increase capability for adopting this new learning platform (Heng & Sol 2020, p. 11). Moreover, Sun (2020) makes some useful recommendations from the perspective of rural communities and particularly poor families with limited access to any form of remote learning. Additional suggestions are for the government to install televisions in public meeting venues in those rural communities so that groups of students can study together,

which Sun (2020, p. 74) advises would help maintain continuity of education and help address educational inequality.

2.4   Research Gap

The preceding review of literature suggests that a number of research studies have looked at the strengths, limitations, and effectiveness of online study in different countries during the pandemic. The result varies from one to another as each country adopts different online platforms and methods for their delivery of teaching, but mostly those countries are using television network for broadcasting and some free internet tools like Google, Decebo, Adobe, Class-captive (Yunus, Abubakar & Abudu 2020). The Cambodian government's approach, on the other hand, is quite a different one that adopts Facebook record live for distributing contents to all students nationwide. Online learning for Cambodian students nationwide, especially for government schools, is a very new experience for them. The online education approach in Cambodia has not received much interest from scholars. By the time of this research being written, only a few short articles, such as that by Heng and Sol (2020), have considered the challenges of online/distance learning during COVID-19 in developing countries by using Cambodia as one of the examples. However, none of these studies have conducted a systematic review of the Cambodia government's online learning platforms or provided a comprehensive assessment of strengths and weaknesses of online learning tools. This lack of studies in the international development literature on Cambodia's response to delivery of education during the pandemic represents a significant research gap needing to be investigated. Therefore, this research project aims to remedy this gap by examining and analysing Cambodia's approach to online education during the pandemic and assessing the strengths and limitations of key online learning platforms available to the government and educators.

2.5   Concluding Remarks

From the literature review, it can be seen that online education offers a very important opportunity to bridge the gap of education inequality between developed and developing nations, between the wealthy and the poor, between urban and rural citizens, and between the affluent communities and the underprivileged parts of society. As demonstrated in this chapter, developed countries like Australia and developing countries like Pakistan, Indonesia, Nigeria, Thailand, Vietnam, and Cambodia are all taking measures to enable learning to continue in their respective countries while maintaining the safety of their people. All these countries mentioned in the

literature are adopting online learning and distance learning through internet and TV, some using innovation, some using conventional means, each with their own strategies and modes of education delivery. It requires a great deal of resources to make online education possible: internet connectivity, computers, Smartphone, and ICT knowledge of both teachers and students. While online learning is considered a very useful learning platform, some research still suggests the superior advantages of conventional classrooms where students meet teachers face to face. There is also the claim that online learning mainly benefits the rich people, but less so the poor people in the underprivilege communities (Hossain 2020). Hence, the Cambodian government introduced educational TV as a distance learning method because it could reach people in the communities where internet is not available. While TV has been moderately successful, much more will need to be done to make online learning more reachable and affordable for all Cambodians in the future.

CHAPTER 3. GLOBAL PANDEMIC AND CAMBODIAN GOVERNMENT RESPONSE ON EDUCATION SECTOR

This chapter will provide a brief overview of the Cambodian education system and a historical background of education disruption that impacts the Cambodian education sector to date. The details of Cambodian government approach and education policy in responding to the continuation of learning during the pandemic will be described here. In addition, this chapter will highlight the current teacher ICT training and education, and the roles of teachers during the pandemic.

3.1   Education in Cambodia

Cambodia has a very interesting history of the education system. Due the widespread religious practice of Buddhism, Cambodia has had a long history of temple education taught by the Buddhist men (monks: sangha or acharj) who were the volunteer teachers. This traditional schooling system was implemented in as early as the 7th century, but the education was mainly for elite families only (Chandler 1988, as cited in Dy 2004, p. 92). Moreover, this traditional education was restricted to males only due to the teachers being Buddhist monks (males) and the students stayed and worked at the temple during their study (Dy 2004, p. 92).Therefore, the girls were not allowed to have access to formal education at all during that period.

This traditional education system was in practice until the early 1900s when France modernised the educational system by integrating a French schooling system. Dy (2004, p. 92) notes that Cambodia was a French colonial territory for 90 years from 1863 to 1953. Yet, the modernisation of the Cambodian education system began in the early 1900s when the opportunity arose allowing girls to join in formal education for the first time in Cambodia's education history. However, Clayton (1995, p. 1) argues that even though France modernised the Cambodian education system, France purposedly restricted Cambodian students from fully accessing education in order to maintain the colonialism power. For example, Clayton (1995, p. 6) mentioned that by 1944 only 500 pupils per year completed primary education from the 80,000 enrolments, and only 2700 secondary students were enrolled in eight French modern schools in Cambodia by 1953. Having very limited access to modern education during that time represented serious challenges for Cambodian students to achieve literacy and to participate in governance and civil society once the country gained its independence from France.

Cambodia achieved full independence from France on November 9, 1953. During that early period following independence, King Norodom Sihanouk introduced compulsory education for children aged 6 to 13 years as recommended by UNESCO aiming to bring prosperity to the nation by educational development (Dy 2004, p. 94). The effort of King Norodom Sihanouk to bring education for all has seen remarkable progress and is acknowledged by scholars as a turning point in the country's progress. Dunnet (1993), as cited in Dy (2004, p. 94) claims that with the commitment and vision of King Norodom Sihanouk on educational development, Cambodia at that time had one of the highest literacy rates and most progressive education systems in Southeast Asia.

Too soon after independence, Cambodia was drawn into a period of instability under the Khmer Rouge regime, which was marked as 'Year Zero' between 1975-1979 as a result of the coup d'état by Lon Nol, Prime Minister of Cambodia who had overthrown Prince Norodom Sihanouk. Clayton (1998, p. 2) notes that Khmer Rouge regime leaders promoted the idea of an egalitarian society, but set about eliminating those who were suspected of association with the previous regime, especially the scholars such as students, teachers, engineers, doctors, and all other educated Cambodians. All sectors were disrupted, especially the education sector which was completely dissolved. Clayton (1998, p. 6) asserts that 90 per cent of school buildings were destroyed, all books and library resources were burned, and all school facilities were eliminated. The Khmer Rouge regime lasted exactly three years, eight months, and twenty days which was estimated to have cost between 750,000 to 3,331,678 lives (Clayton 1998, p. 2) from the combination of assassination and death from malnutrition, hunger, overwork, lack of medical care, and despair and heartbreak (Tully 2006, p. 172). The period of the Khmer Rouge regime was the darkest era in the Cambodian history leaving the surviving people to live with tremendous loss, horror, hopelessness, poverty, anger, and trauma. Little was left of what was once a proud and prosperous nation; thus, Cambodians were forced to rebuild their nation from ground zero with the assistance from other nations and the United Nations Transitional Authority in Cambodia (UNTAC).

Currently, Cambodian public education comprises of four academic levels: pre-school education, primary education, secondary (lower and upper) education, and tertiary education. Pre-school education is not compulsory, for children ages between 3 to 5 years old. The minimum age to attend the primary school is 6 yars old. The primary school starts from grade 1 to 6, lower

secondary school starts from grade 7 to 9 and upper secondary school starts from grade 10 to 12. Most students complete the upper secondary education at the age of 18. Completing primary and lower secondary education is considered as having a Basic Education (Grades 1–9) (MoEYS 2004b, p. 3). The Cambodian government encourages all individuals to at least complete basic education, and the public education from pre-school to upper secondary is free for all (Royal Government of Cambodia 1993). Upon completing the basic education, the students can decide if they want to go to upper secondary education which takes two more years, or they can take vocational/technical training. However, if they want to pursue tertiary education, students must finish upper secondary education or have an equivalent degree recognised by MoEYS. Tertiary education requires four years to complete, but if the students fail the upper secondary exam, then the students can enrol in an associate degree which takes two years to complete and then proceed to the bachelor's degree which takes another two years to complete.

The Cambodian government has made significant efforts to promote the universal primary school education by building more schools throughout the country to meet the need of an increasing demand for education, as can be seen by the 7,228 primary schools shown in Table 2. This is especially true in the remote area programs bringing education to all disadvantaged communities, recruiting and training more primary school teachers, and introducing the Child Friendly School Policy, allowing more students to enrol in primary education (Seng et al. 2018, p. 7; UNESCO 2015, p. 12). As a result, according to UNESCO (2015, p. 12), as of 2015 there were 12,863 pre-schools and general schools throughout the country, allowing 97.9 per cent of net admission to primary education, which was an increase from 84 per cent of net enrolment in 2000 (Seng et al. 2018, p. 7). Moreover, the number of qualified primary school teachers also increased from 14.1 per cent to 60.4 per cent from 2000 to 2013 (MoEYS 2014, p. 40).

Table 2: Schools, Classes, Students and Staff, academic year 2018-2019

Education Level	Number of School	Number of Students	Number of Teachers
Primary School	7,228	2,040,257	45,836
Lower Secondary Level	1,739	610,261	28,758
Upper Secondary Level	525	321,145	13,774
By Area of Location: - Urban Area - Rural Area	 1,422 11,878	 594,914 2,594,258	 23,450 70,253

Source: MoEYS (2019b)

Table 2 displays the type of schools and classes and numbers of students and teachers throughout Cambodia during the academic year 2018-2019. There were more than 3.1 million students enrolled in different institutional education across the country comprises of 594,914 students in urban area, and 2,594,258 students are in rural areas. Among the student population, 2,040,257 are students in primary schools while the secondary school students account for 931,406.

Table 3 illustrates the breakdown of primary students in 25 provinces and cities in Cambodia. Among the 2,040,257 students in primary schools, 138,900 are in Phnom Penh, the capital city of Cambodia, while the rest are in the provinces. The majority of primary school students are in the rural areas account for 1,700,731 while 339,000 are studying in schools where are considered as urban areas.

Table 3: Primary Schools, Classes, Students and Staff by Province

Province	Number of Schools	Number of Students	Number of Teachers
Banteay Meanchey	410	96,900	2,911
Battambang	644	171,713	3,627
Kampong Cham	408	141,437	2,601
Kampong Chnang	278	74,274	1,779
Kampong Speu	313	110,874	2,225
Kampong Thom	487	100,565	2,425
Kampot	311	78,535	2,305
Kandal	374	159,688	2,458
Kep	22	5,104	202
Koh Kong	121	16,689	615
Kratie	274	63,323	1,454
Mondul Kiri	89	14,576	563
Otdar Meanchey	218	37,379	957
Pailin	48	10,316	293
Phnom Penh	164	138,900	3,648
Preah Sihanouk	72	26,923	833
Preah Vihea	228	37,343	1,203
Prey Veng	544	149,003	2,765
Pursat	305	69,224	1,572
Ratanak Kiri	220	40,979	776
Siemreap	503	164,652	3,111

Province	Number of Schools	Number of Students	Number of Teachers
Stung Treng	152	25,807	742
Svay Rieng	262	72,118	1,685
Takeo	382	118,349	2,894
Tbaung Khmum	399	115,586	2,192
Whole Kingdom	***7228***	***2,040,257***	***45,836***
- Urban Area	675	339,526	9,565
- Rural Area	6553	1,700,731	36,271

Source: MoEYS (2019b)

Very similar to the primary school students, the secondary school students (comprises of lower and upper secondary schools) are mainly undertaking the class in rural areas. As Table 4 illustrates, in the academic year 2018-2019, the city of Phnom Penh alone accounted for 86,663 secondary education students, and the rest are in all other cities and provinces. There are 216,592 secondary education students in urban areas while 714,814 students are in the rural areas.

Table 4: Secondary Schools, Classes, Students and Staff by Province

Province	Number of Schools	Number of Students	Number of Teachers
Banteay Meanchey	84	39,066	1,786
Battambang	122	63,003	2,699
Kampong Cham	123	64,566	2,867
Kampong Chnang	76	36,956	1,567
Kampong Speu	95	49,462	1,976
Kampong Thom	91	45,466	1,723
Kampot	100	44,203	2,187
Kandal	140	75,907	4,297
Kep	6	2,676	223
Koh Kong	32	7,746	428
Kratie	54	18,956	961
Mondul Kiri	14	4,598	219
Otdar Meanchey	38	13,690	485
Pailin	9	4,689	299
Phnom Penh	66	86,663	5,865
Preah Sihanouk	27	12,166	689

Province	Number of Schools	Number of Students	Number of Teachers
Preah Vihea	64	14,221	723
Prey Veng	123	70,192	2,485
Pursat	59	27,073	1,424
Ratanak Kiri	25	10,747	433
Siemreap	121	75,258	2,418
Stung Treng	31	6,952	433
Svay Rieng	74	38,203	1,816
Takeo	118	75,784	3,162
Tbaung Khmum	79	43,163	1,367
Whole Kingdom	*1,771*	*931,406*	*42,532*
- Urban Area	230	216,592	12,871
- Rural Area	1,541	714,814	29,661

Source: MoEYS (2019b)

3.2 COVID-19 impacts on Cambodia Education

The first confirmed case of Covid-19 in Cambodia was identified on January 7, 2020 in a resident in Sihanoukville Province (*Channelnews Asia* 2020). Since the outbreak in early 2020, the Cambodian government had been initially reported as succeeding in containing the virus with the total number of cases as only 461 and zero deaths as of January 31, 2021. However, in late February 2021 the virus spread more widely into the community resulting a significant increase of new cases from 461 to 2,752 and 21 deaths, as of April 6, 2021 (Worldometer 2021). On March 20, 2021, MoEYS issued an announcement to temporarily shut down all schools nation-wide until further notice requiring all schools to adopt an online mode of teaching delivery, as mentioned in the letter issued by MoEYS. Schooling gives fundamental learning and when schools close, children and youth are denied opportunities for development and advancement. The effects are unbalanced, being more serious for underprivileged students who will in general have fewer educational opportunities beyond schools (UNESCO 2020a). Closing all schools nationwide meant that all students were not able to go to school anymore but stayed home with their families which required some parents to miss work to take care of them and provide home schooling resulting in economic cost to the families. At the same time, the school dropout rates were predicted to rise, especially for underprivileged students whose families experience economic shock from the pandemic that adds more responsibilities for them to generate income for their families (UNESCO 2020a). In Cambodia, as can be seen in Table 3, there are 1,700,731 students in

rural areas. Therefore, the decision by MoEYS to abruptly close all schools in the country disrupted student learning, especially those who live in rural areas, which is anticipated to have significant negative impacts on student learning outcomes.

3.3 Mapping Education Response of Cambodian Government on COVID-19 Pandemic

Information and Communication Technology (ICT) has been widely acknowledged as a powerful tool for distributing information and knowledge that could bridge the gap of education inequality (Khan et al. 2012, p. 62). The use of ICT is an advantage for creating a learning environment where teachers can transfer their knowledge to students, so that students can access knowledge in an active, self-directed and constructive way (Volman & van Eck 2001, p. 614). The Cambodian government acknowledges the importance of ICT in education and has integrated the ICT into the Education Strategic Plan (MoEYS 2019a). The aim is to promote digital education by integrating ICT as a tool for teaching and learning to ensure students are equipped with ICT knowledge and skills for employment and using e-learning to support the delivery of education. As of 2018, only 5 per cent of upper secondary schools use ICT as a tool to support teaching and learning. MoEYS aims to increase the use of ICT to 25 per cent by 2023 for upper secondary schools in the entire country (MoEYS 2019a, p. 78).

The ICT service and infrastructure in Cambodia has grown rapidly in recent years. There are 6 mobile phone network operators, and 37 internet service providers currently operating in Cambodia making internet and mobile phone services available in most parts of the country. However, all of those mobile phone operators and ISPs are private investors meaning that users must pay subscription fees and charges to use the services. Mobile phone subscription comes with internet connection which is charged directly from the phone credit based on the data usage. According to the report from Telecommunication Regulator of Cambodia, the country has 14.8 million mobile internet subscribers as of May 2020, accounts for 90 per cent of Cambodian total population (Xinhua 2020b), whereas the subscription to fixed broadband internet service providers was seen at 249,000, a 33 per cent increase from the previous year, and accounts for 1.51 per cent of Cambodian population (May 2021). In addition, the Ministry of Post and Telecommunication (MPT) has advised all cellular operators to improve cellular service in all areas especially in rural areas to meet the demand of the public for internet service, especially for online learning. 'All cellular operators must improve their signals in all areas, notably urban areas and

new development zones by promptly installing additional equipment and new cell towers', the letter reads (Ministry of Post and Telecommunication 2020).

In addition, television viewing is also popular in Cambodia, especially for those who are in the rural areas where internet services might not be available. There are 18 television stations in Cambodia, and only one station (TV Khmer) run by the state, making TV the most popular media type in Cambodia claiming to reach up to 96 per cent of Cambodian audience, and 57 per cent of Cambodians mention that they watch TV to access the news (Reporters Without Borders 2021).

Since the emergence of COVID-19, MoEYS has temporarily closed educational institutions to prevent the spread of the virus. This practice has caused disruption in delivering education to students in many affected areas. To provide ongoing education to students and in the meantime to minimise the impact from education interruption, MoEYS collaborates with UNESCO's Capacity Development for Education (CapED) Programme to provide education in Cambodia by developing and producing 200 teaching video lessons (see Picture 1) and hosting them in three different forms: Facebook, YouTube, and an E-learning website where students can access information (UNESCO 2020c). The television channels are also used to broadcast recorded tutorial videos. The tutorial videos are for all grades from Kindergarten to Secondary levels, and each tutorial takes about 30 minutes on average.

Picture 1: The recording of teaching sessions for online/distance learning
Source: UNESCO (2020c)

The decision to use internet and TV as a teaching delivery and learning tools is appropriate in Cambodian context as TV stations and internet subscription services both mobile internet and fixed broadband connections are already available in most parts of the country.

3.4   Learning Platforms

On the 13 March 2020, the MoEYS issued an announcement to introduce E-learning that consists of six core topics which can be accessed via three different platforms: MoEYS' YouTube Channel, MoEYS' Facebook Page, and MoEYS' E-Learning effectively immediately. To increase the reach of education, on 20 April 2020, MoEYS introduce two more platforms: TV channel, and mobile phone application for E-learning (see section 3.5.4) (MoEYS 2020a, 2020b).

MoEYS selects teachers from kindergarten to secondary education levels to teach the lessons based on their specialties. The teaching sessions are conducted in a recording studio where MoEYS officials video tape the sessions and upload into social media platforms and broadcast on TV for students' access. There are ten disciplines that are videotaped for students to learn from home: Khmer literature, Mathematic, Earth (Environment), Morality, Biology, Geography, History, Chemistry, Physic, Physical Education, and Correction exam papers which are for grade 12 students. Picture 1 shows a tutorial being filmed in a classroom studio. Each teaching session takes between 20-60 minutes depending on the depth of the lesson. In each teaching session, the teachers teach theory and practice exercises where teachers ask questions and wait about 30 seconds giving time for students to think and then the teachers just answer the question afterward.

3.4.1 Facebook

The recorded teaching videos are uploaded into the Facebook channel (www.fb.com/krou.moeys.gov.kh) created by MoEYS specifically for the purpose of disseminating the teaching lessons.

Khmer Literature	Khmer Literature	Mathematic
Mathematic	Khmer Literature	Khmer Literature

Picture 2: Screenshot of recorded live videos on MoEYS' Facebook page capture from www.facebook.com/watch/krou.moeys.gov.kh

The videos are uploaded as soon as they are recorded to ensure the students can access them as soon as they can. There are some recorded live teaching sessions as well and those sessions remain available on MoEYS' Facebook page after the live session ends which allows students to access teaching sessions anytime later.

During a period of one year from March 2020-2021, MoEYS uploaded 2,463 videos of teaching sessions into Facebook page enabling hundreds of thousands of students access the teaching via the Facebook page. The data from MoEYS' Facebook page shows that the total number of views for an entire year for each class varies significantly. Among all grades, grade 12 teaching videos receive the most view at more than 12 million views follow by grade 1,2,3 receiving between 8.5 to 9.5 million views. The reason grade 12 tutorial videos receive most views compared to other grades is because this grade is taking extra learning to prepare themselves for a national exam. Also, the MoEYS provides videos on exam preparation and marking test papers from previous years' exams for students to practice and get ready for their test. Grade 9 videos had total viewing of 2.5 million students, while the grade 5,6 had each viewing between 1.1 to 1.2 million (see Figure 1).

Figure 1: Number of views of tutorial videos uploaded in Facebook from Grade 1-12 between March 16, 2020 to March 16, 2021
Source: The author created this graph by compiling data from MoEYS Facebook (2020)

Each grade has a different total view as the total number of teaching sessions are different as well. The breakdown of the total teaching sessions from the Facebook page shows that each grade has different numbers of teaching videos uploaded. Among all the grades, grade 12 students receive more teaching sessions which is seen at 778 teaching videos compared to grade 9 which is at 208 teaching videos. The grade 1, 2, 3 are having similar numbers of teaching sessions between 150 to 190 for each grade. The rest are having less than 50 videos uploaded for each grade (see Figure 2).
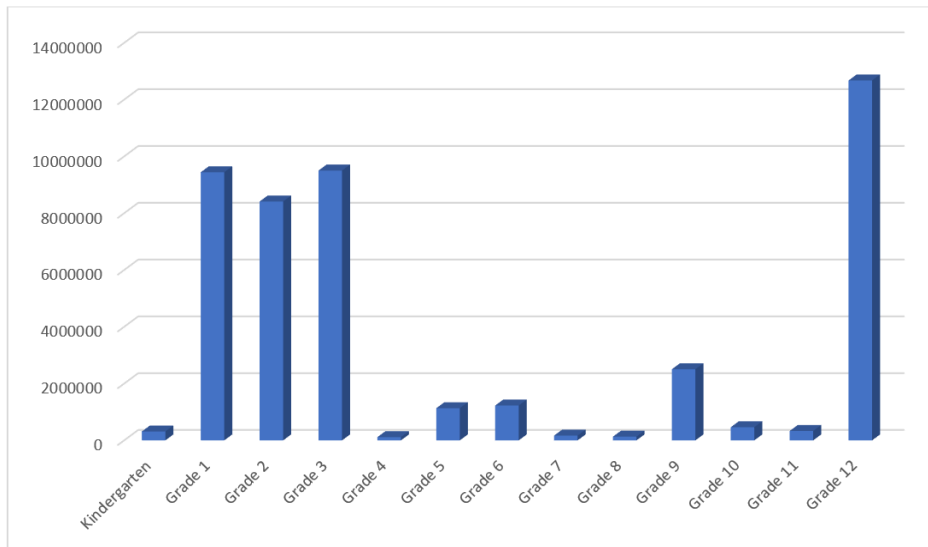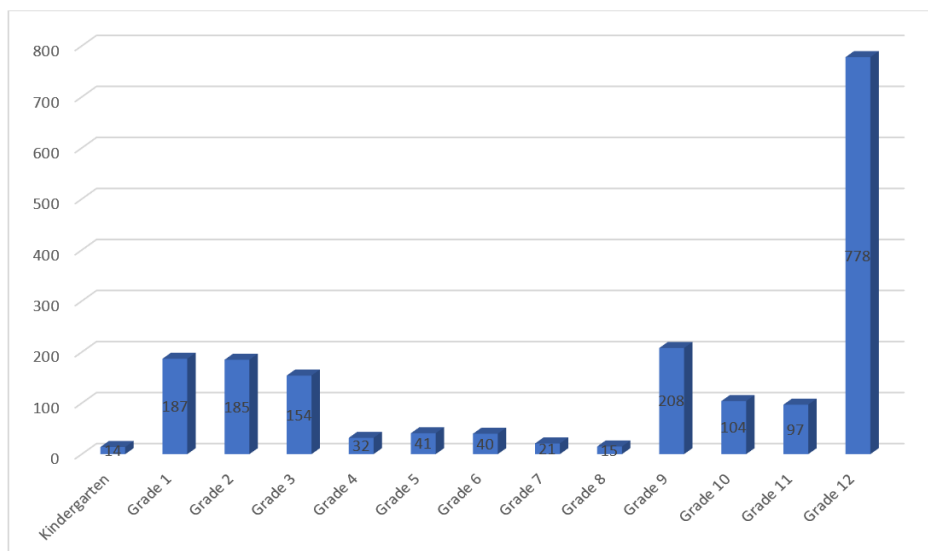

Figure 2: Number of tutorial videos uploaded in MoEYS' Facebook page for each grade between March 16, 2020 to March 16, 2021
Source: The author created this graph by compiling data from MoEYS Facebook (2020)

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3.4.2 YouTube

The same videos that were uploaded into Facebook Page, are also uploaded into YouTube page (see Picture 3) to create more ways for students to access the learning materials. All the videos are then grouped by grade and by topic.
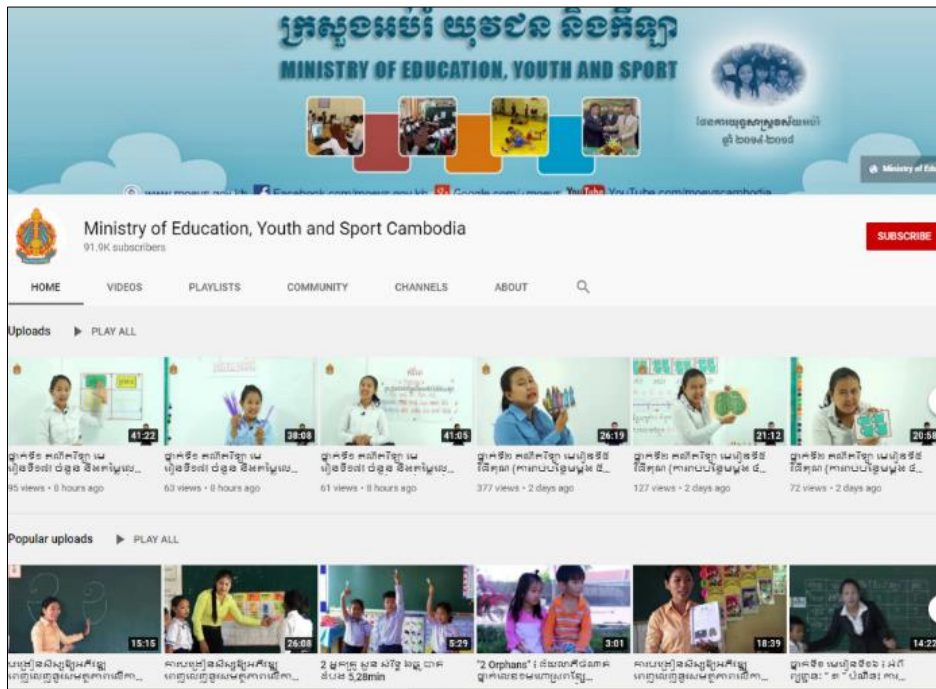
Picture 3: Videos posted on the first YouTube channel are now uploaded in MoEYS' main YouTube page at www.youtube.com/moeyscambodia

Originally, the MoEYS had two official YouTube channels: The channel www.youtube.com/moeyscambodia is the main channel for MoEYS to communicate with the public; and the www.youtube.com/moeys was created solely for uploading recorded teaching videos for students to learn during the global pandemic. However, the YouTube channel (www.youtube.com/moeys) MoEYS has claimed that the official YouTube channel for hosting teaching tutorial videos is no longer accessible as of March 2021. In addition, this research has found that the tutorial videos are being uploaded into MoEYS' channel address (www.youtube.com/moeyscambodia), which was created since Mar 25, 2011, as a replacement to the original YouTube channel that is now inaccessible. Since the www.youtube.com/moeys is inaccessible, the author is not able to access the video view data for the period of study. Therefore, the author uses the data from the new Channel that is up and running now.
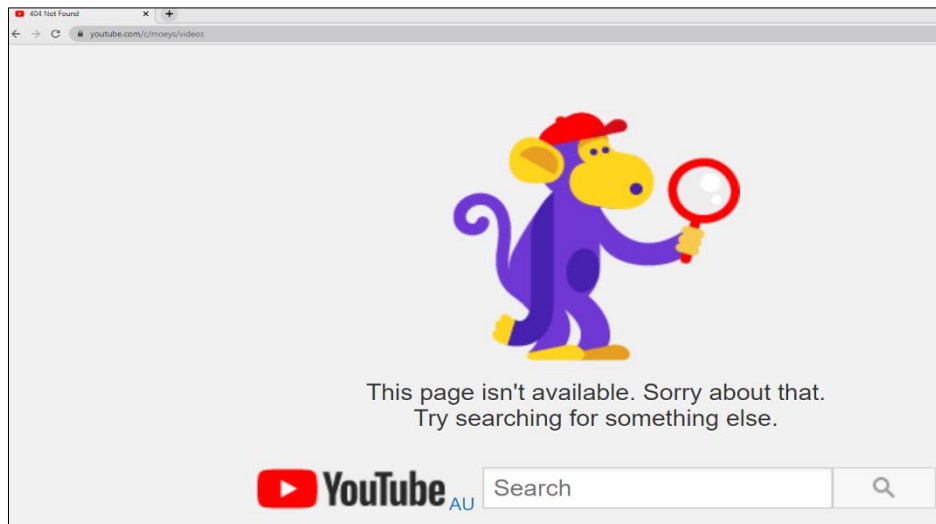
The data from MoEYS' YouTube Channel shows that the first recorded teaching video, which was created for distance learning during the global pandemic, was uploaded on 2 March 2021 and as of 18 April 2021, at the end of this research, there were 1,721 videos that have been uploaded into the MoEYS main channel for grade 1 to 12 with the total of ten subjects. YouTube has a function that allows the channel's owners to create a playlist of the contents. With this option, the tutorial videos are grouped into playlist by grade with topics allowing students to browse much faster and easier for appropriate videos for their grade.
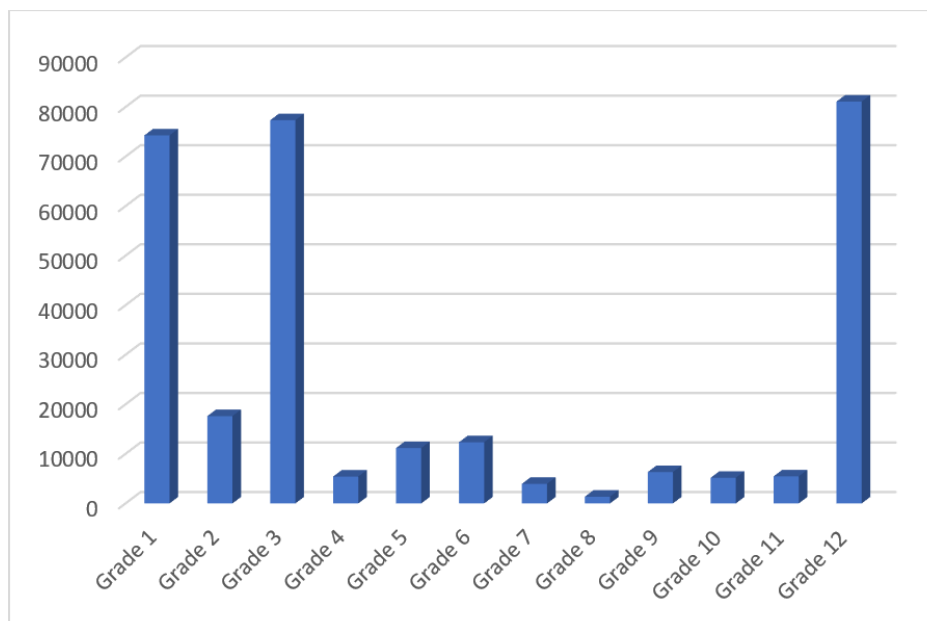
Figure 3: Total view of teaching videos uploaded in MoEYS' YouTube channel between March 2-April 18, 2021.
Source: The author created this graph by compiling data from MoEYS YouTube channel (2020)

The YouTube data between 2 March 2021 to 18 April 2021 shows that grade 12 has the highest total views of 81,099 follows by grade 3, and grade 1 at 77,340 and 74,276, respectively. Among all grade, grade 8 received the least total views at 1,360 (see Figure 3).

3.4.3   E-Learning website

Students can access the E-learning website managed by MoEYS by visiting the web address www.elearning.moeys.gov.kh. In the front page, the students will find the available courses in each grade from grade 1 to grade 12. Upon clicking the grade, the available subjects for the grade will show up (see Picture 5).

Grade 1	Grade 2	Grade 3
Grade 4	Grade 5	Grade 6
Grade 7	Grade 8	Grade 9
Grade 10	Grade 11	Grade 12
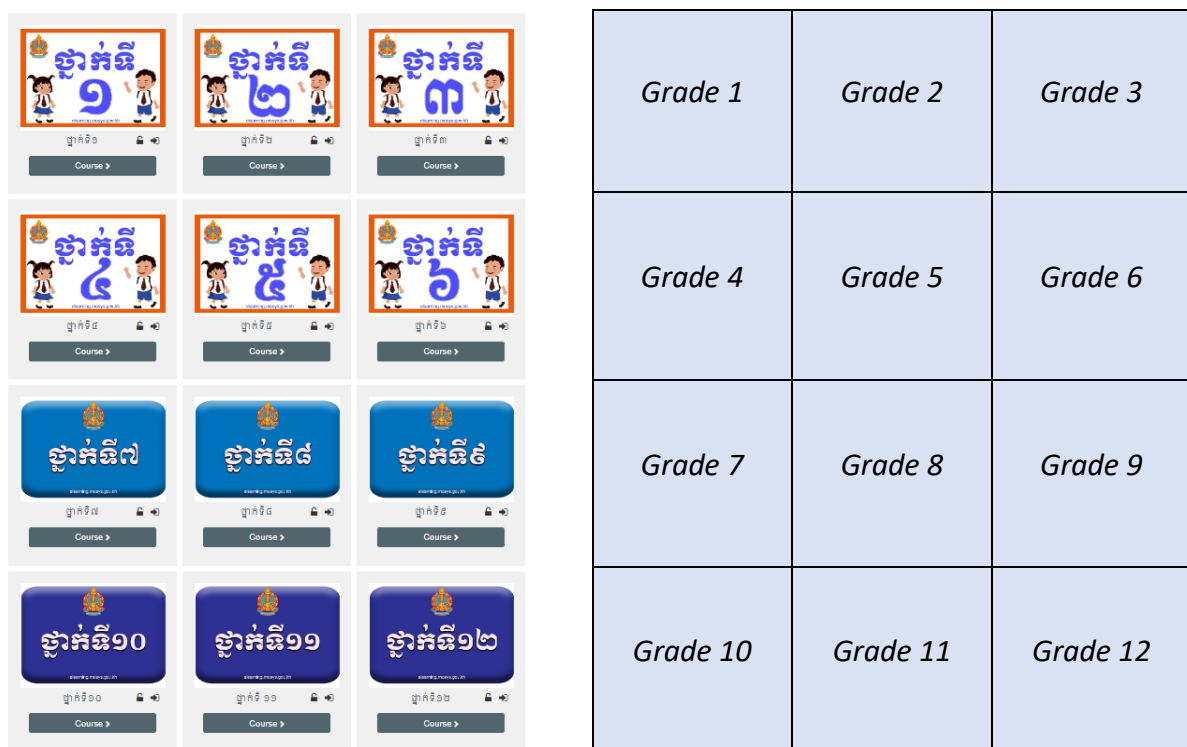
Picture 5 : Screenshot of available courses from grade 1-12 on E-Learning webpage.
Source: MoEYS (2020c)

The E-Learning website used the same videos that were uploaded on the Facebook page and YouTube page. However, the E-Learning website does not host those videos directly in its hosting service but embeds the videos from the YouTube channel which means the availability of E-Learning videos depends on the MoEYS' YouTube channel. Therefore, the number of total views on MoEYS' YouTube channel also includes all traffic from the E-Learning website (see Picture 6).
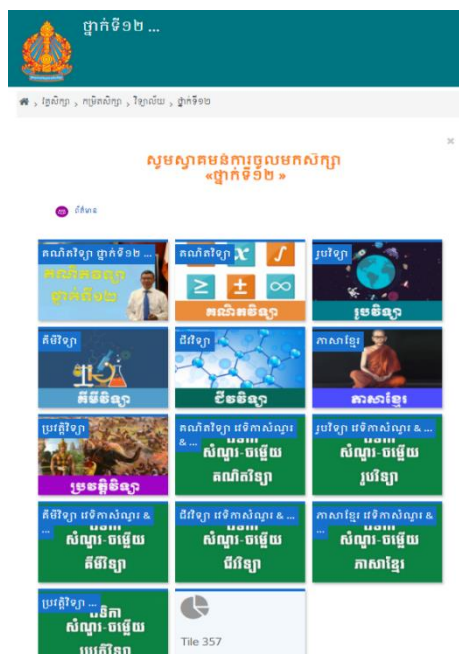
Picture 6 : Screenshot of E-learning webpage for all subjects for grade 12.
Source: MoEYS (2020c)

Since the E-Learning website embeds the videos from YouTube channel, once the teaching videos from MoEYS' YouTube channel are deleted, the videos will not be available for access in E-Learning website as well. When the E-Learning website was announced by MoEYS on March 13, 2020, the videos for all subjects for all grades were linked to the old MoEYS' YouTube channel (the YouTube channel that has been terminated) for students to access. However, as of March 2021 once the old YouTube channel had been terminated, the access to the learning materials via the E-Learning website was also interrupted (see Picture 7). As shown in Table 5, there are 196 video tutorials for grade 9 but only 43 videos are accessible and 153 videos tutorials are not available due the YouTube account associated with the videos has been terminated.

Table 5 : Number of subjects and videos for each grade on E-learning website.

Grade	1	2	3	4	5	6	7	8	9	10	11	12
Number of Subject	2	2	2	2	2	2	4	7	7	5	6	6
Total Teaching Videos	209	31	265	61	21	20	5	44	196	92	154	255
Inaccessible	0	0	0	0	0	0	5	6	153	0	95	1

Source: MoEYS E-Learning (2021)
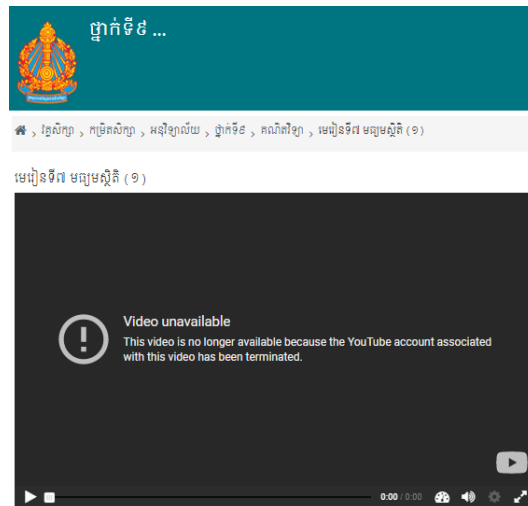
Picture 7: The access to lesson 7 of Mathematic subject for grade 9 is not accessible due to the associated YouTube account has been terminated: www.youtube.com/moeys

3.4.4 Television channels

The recorded teaching videos are broadcast in television channels from 20 April 2020, the day that MoEYS issue the letter announcing the use of TV as another mode of teaching delivery. The announcement letter states that 'From 20 April 2020, all students from all levels of study nation-wide will be able to view recorded teaching videos via TV on the following channels: TVK2 Channel, Channel 22 of Decho TV, and 55 channels of Cable TV available in 25 cities/provinces' (MoEYS 2020b, pp. 1-2).

Recorded teaching videos (see Picture 8) are broadcast on designated TV channels for 24 hours a day and seven days a week, but the broadcasting schedule is divided into two timeslots: from 8:00AM to 12:00AM for daily teaching videos, and from 12:00AM to 8:00AM for re-broadcasting the same teaching videos allowing the students who miss the lesson during the daytime to be able to watch again (MoEYS 2020b, p. 2). The teaching videos for grade 9 and 12 are broadcast three hours for each grade because these two grade levels are required to take a national exam at the end of their academic year.

Picture 8: Teaching video broadcast on TVK2 Channel for grade 11.

3.5   Other Response

The use of ICT in education has been actively promoted by MoEYS with the support from development partners, such as UNESCO and Open Institute (MoEYS 2004a; UNESCO 2010). However, the use of ICT in Cambodian education is still limited, and the majority of Cambodian teachers are not familiar with the use of ICT to facilitate their teaching, as most of them, especially the teachers in rural areas, prefer the traditional forms of classroom teaching.

Since the Cambodian government has introduced e-learning and distance learning to ensure the continuity of education during the pandemic, the teacher ICT knowledge is critical to make this process proceed as planned. However, realising the limited knowledge of ICT among Cambodian teachers, the MoEYS has provided additional ICT training for teacher trainers in various provincial teacher training colleges (MoEYS 2020d). These efforts are aiming to equip teacher trainers with ICT skills so they can apply the new skills when delivering teaching sessions for teacher trainees. The ICT training sessions have been conducted in the provincial teacher training colleges of Kampong Thom, Preah Vihea, Phnom Penh, Kampong Speu, Kampong Chnang, and Svay Rieng provinces (MoEYS 2020d).

3.6   Concluding Remarks

Cambodian education was completely dissolved by the civil war and genocide that took place between 1975-1979. Since then, education has been one of the top priorities of the Cambodian government for building human resources, especially to enable Cambodia to qualify as an upper-

middle income country by 2030. Yet, the presence of the COVID-19 pandemic has caused another disruption for Cambodia's education. With the availability of technologies, MoEYS has assured the continuation of education by introducing online and distance learning through the adoption of Facebook, YouTube, E-learning, and TV. Among the four main platforms, Facebook has received the most interest from students, especially for those who have access to internet and computer or Smartphone. However, television has been shown to be more beneficial and popular for those Cambodians living in rural and remote areas where internet is unreliable or unavailable, and where many poor communities cannot afford technology.

CHAPTER 4. ASSESSING CAMBODIAN GOVERNMENT RESPONSE MEASURE

This chapter discusses the strengths and limitations of the Cambodian government's education response in implementing online learning during the global pandemic. The analysis will focus on four modes, namely Facebook page, YouTube channel, E-learning, and television broadcasting with discussion being disaggregated into different levels including primary education, lower-secondary education, and upper-secondary education.

4.1   Analysing the online teaching platforms

4.1.1   Facebook

MoEYS has launched online learning via Facebook amidst the current trend where Cambodians have increasingly used Facebook for both personal, business, and working communications. In principle, the Facebook platform allows students to watch videos as much as they want due to the nature of Facebook application and how it works. All videos uploaded on this platform are still available for students to view later at any time. In addition, the live teaching sessions on Facebook page also remain accessible even after the live sessions end. The availability of videos for students to access at any time is very useful for them to learn as they can watch the teaching videos again for the parts that they did not understand. As a result, the use of Facebook in education creates a learning environment that helps improve communication, encourages participation, motivates students, and boosts performance for both teachers and students, as suggested by the evidence from the academic literature review in Spain by González-Ramírez, Gascó and Taverner (2015, pp. 68-9).

In Cambodia, the Facebook platform has several strengths for promoting online learning. Firstly, it is the most popular social media application in the country. People from different backgrounds have used it for reading the news, instant messaging, advertising and promoting business, and as a way of distributing information. Latest statistics suggest that there were 8.40 million active social media users in Cambodia as of January 2019. The figure increases to 12.13 million or equivalent to 71.2 per cent of the total population by March 2021 (NapoleonCat 2021; UNICEF 2019). The most active Facebook users are teenagers and adults aged between 18-34 years old, which accounts for 74.2 per cent of all Facebook users. Secondly, Facebook is much easier to use and can be viewed anytime and anywhere. This social media platform is also very attractive to children at primary

school level, which could be beneficial for their learning if properly managed and monitored. Hence, teaching via the Facebook platform would have higher probability of success and be an excellent option to reach more students.

The data obtained from MoEYS shows that the Ministry has uploaded 2,463 tutorial videos into its Facebook page between March 2020 to March 2021 (see Figure 2). The tutorial videos are for all grades from pre-school to grade 12. Tutorial videos for Primary School level were viewed 29,830,203 times, which is about 14 times higher than the actual number of students in that level, illustrating the concept of repeat viewing for enhanced learning. For Lower-Secondary level, there were 2,802,749 times, which means a student in that level views the video on average four times. Likewise, the students at Upper-Secondary level also receive much interest in the tutorial videos on Facebook. There are 321,145 total students in Upper-Secondary level, but the total video views for this level is 13,466,173, more than 41 times greater compared to the total number of students (see Figure 4). The main reason for this is likely to be because the Upper-Secondary level students are preparing for the national exam at the end of the year. In the Cambodian education system, Upper-Secondary level students must take a national exam to be marked as the completion of general education before being eligible to enter the tertiary education level.

According to the study by DiVall and Kirwin (2012) in the US, students will use Facebook more intensively to access learning materials of the associated subjects that will appear in their exam. Therefore, the grade 12 students of Upper-Secondary level are likely to be studying extra hard to prepare for the exam and make use of the contents on MoEYS' Facebook page. In summary, the statistics illustrated in this section and the discussion in Chapter 3 have showcased the importance of teaching on Facebook in promoting online learning in Cambodia and have demonstrated how Facebook enables students to take advantage of the platform's functions to maximise their learning and academic achievement.
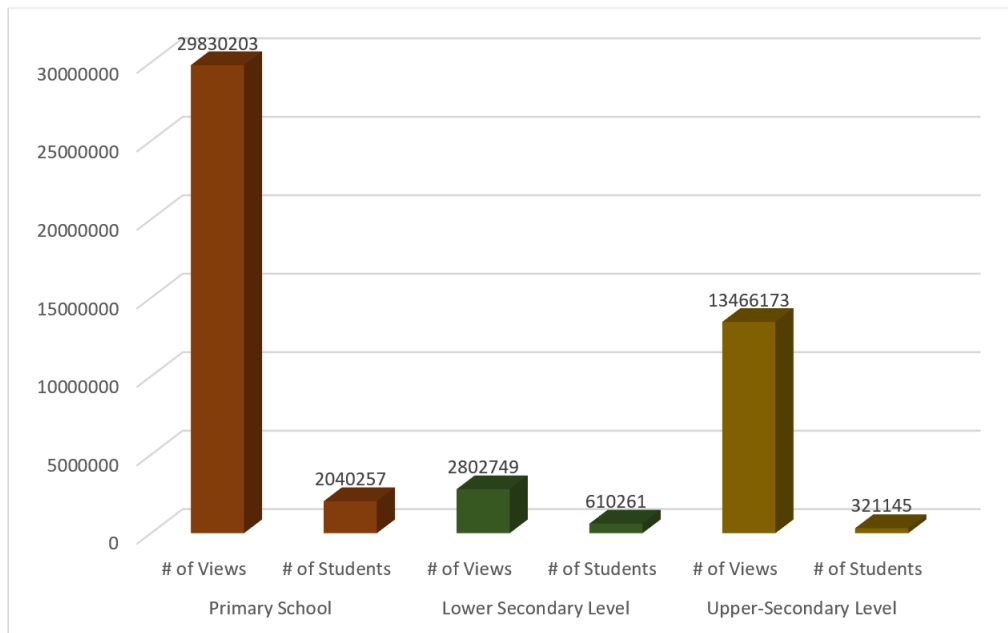
Figure 4 Number of Facebook video views for each education level and number of school students for each education level, academic year 2018-2019.
Source: The author created this graph by compiling data from MoEYS (2019b), MoEYS Facebook (2020)

Despite its prominent strengths, teaching via Facebook has a number of notable weaknesses. The most important limitation relates to the broad issue of ITC infrastructure development in which Cambodia is behind other countries in the region. Viewing videos on Facebook page requires access and reasonable speed of internet and thus lack of broadband internet could to some extent disrupt online learning. Zoroja, Skok and Bach (2016, p. 9) assert that the main obstacles to online education are the speed of the internet, having a computer at home, and resources available to teaching staff, such as training and access to advanced technology. In Cambodia, although 90 per cent of the population has access to the internet, the reach to rural areas remains limited (Chan 2018; Xinhua 2020b). As well as the limited access to internet, Smartphones in rural areas may be hampered by low signal of service resulting in slow internet connection, and the internet service is expensive relative to standards of average income outside urban areas. Cambodian people usually charge their phone credit using pre-paid card which ranges from 0.25 USD to 50 USD (Jeutravel 2018). In addition, many parents do not have computers or smart phones to access the tutorial videos. Some in rural areas may have Smartphones owned by the family, but the parents will need to use the phone for their business, leaving the students unable to access the learning materials online. Therefore, the Facebook video platform is mainly suitable for those who have good internet connection and are living in the more urbanised, affluent families that can afford the internet service. Conversely, the students who are in remote areas might not be able to maximise

the benefit from this platform due to limited access to internet and unaffordable costs of gaining access to the education resources.

4.1.2 YouTube

Because of its global image and popularity, YouTube is another common platform for online learning among Cambodian students and parents. The site offers free video hosting services, and the contents are widely accessible to anyone online. Hosting videos on YouTube allows the teaching videos to reach more audience online. This platform is easy for students to view the lesson of their interest at anytime and anywhere as long as they have internet connection and computer or Smartphone. The students can watch the teaching videos again and again as much as they want to understand the particular lesson. In addition, it is free to upload videos on YouTube which is why MoEYS does not need to spend money on the hosting service, and the students can access those materials for free as well. MoEYS has imbedded this learning platform in its educational policy and has created the YouTube channel for online learning purpose. As of March 2021, the Ministry has uploaded 1,721 videos of teaching from grade 1 to grade 12 with various topics including teaching sessions, exercise marking, and exam preparation materials as supplement for grade 12 students.

The major disadvantage of YouTube channel, though, is that it is easily disrupted. For example, the YouTube channel which was initially introduced by MoEYS was disabled causing all uploaded videos to become inaccessible. MoEYS took immediate action by re-uploading tutorial videos into an official MoEYS' YouTube page that was created since 2011. Despite the new uploaded videos, the number of views is very low compared to the number of students on each education level which could mean that the videos have already been viewed by students on the old YouTube channel before it was terminated.

Another limitation is that the video contents for a particular grade are difficult to find due to the method YouTube arranges the videos by uploading dates. The older videos are at the bottom of the page and the newest are at the top. Hence, the students have to browse through hundreds of videos to find the those for their level. There is an option to create the playlist which groups a number of videos into one playlist which enables students to find their videos easier. However, at the time of this research being completed in April 2021, the playlist videos on MoEYS' YouTube page are still minimal. This limitation suggests that the education staff who responsible for managing MoEYS' YouTube page have not created playlists of those uploaded videos for all grades

resulting in difficulty for students to find the tutorial videos for their own grades, instead needing to browse across all uploaded videos.

4.1.3 E-Learning Website

The E-learning website is another mode of online learning platform that MoEYS created to provide more channels to reach more students by using subdomain of the MoEYS' official webpage. MoEYS' E-learning platform has a very user-friendly interface which allows students to navigate easily to find the videos of teaching lessons of their respective grade as the contents are grouped by grade from grade 1 to grade 12. The website is fast loading which enables students to access the page without delay or slow response. MoEYS has put much effort to ensure all students from all grades have access to the tutorial videos by creating tutorial videos for all grades from grade 1 to 12. However, not all grades have the same number of subjects and video tutorials. For example, only Khmer literature and Mathematics are available for primary students while there are seven subjects, including Khmer literature, Mathematic, Physic, Chemistry, Biology, History, and English, available for secondary school students. MoEYS decision to create more subjects in Secondary School level is most likely because students in grade 9 and grade 12 will have state exams at the end of the academic year and the subjects appearing on E-learning websites are those that will appear during the national exam.

However, all the tutorial videos of each grade on E-learning website are not hosted on this website hosting server, but hosted on MoEYS' YouTube channel instead, and embedded into this website. By embedding the videos from outside source like YouTube, the ministry saves hosting space and bandwidth for MoEYS' website webhosting server. Moreover, the videos can therefore be loaded faster due to YouTube is a video hosting platform that provides unlimited bandwidth of video viewing. However, that means the availability of video links embedded on E-learning website totally relies on the availability of videos on YouTube page. Consequently, if the teaching videos are deleted from the YouTube channel, then those videos on the E-learning website are also not available. This represents a risky situation since, if the YouTube account is terminated, all teaching videos on the E-learning website would not be available for students to view. Consequently, there is a potential interruption of learning. For example, the E-learning website of MoEYS was disrupted due to the termination of the original YouTube channel (www.youtube.com/moeys) and consequently all uploaded videos are now inaccessible. As shown in **Table 5Error! Reference source not found.**, among all 1,353 videos contents on E-learning website, only 1093 videos are

accessible as of May 4, 2021 because MoEYS officials have re-embedded tutorial videos from a new MoEYS' YouTube page (www.youtube.com/moeyscambodia). As of May 4, 2021, there are 260 videos still not accessible as the contents still link to the videos on the terminated YouTube channel. MoEYS has put more focus on grades 9 and 12 as these students will have national exam at the end of academic year. For this reason, MoEYS has created more tutorial videos for these grades. However, among all inaccessible videos, grade 9 is the most seriously affected with 153 out of 196 videos not accessible which accounts for 78 per cent of total contents for this grade compared to grade 12 with only one video is not accessible among 255 uploaded videos for this grade. This suggests that MoEYS prioritises the video contents for grade 12, as all students in this grade must prepare for their national exam to advance to tertiary education. Once MoEYS have uploaded all those teaching videos to the new YouTube channel and re-embedded the links, the tutorial videos on the E-learning website will become accessible to the public again.

4.1.4 Television

Broadcasting tutorial videos on television channels is regarded as a stepping stone to expand the reach to more students in the nation, especially for those who are in the rural area where internet is not available. Clearly, broadcasting tutorial videos on TV has higher possibility to reach to students in most families regardless of remoteness because 96 per cent of the Cambodian people have access to TV. Moreover, MoEYS has broadcast in a wide range of television networks to ensure broader coverages and those channels include free public television network (TVK2 Channel), free satellite television network (Channel 22 of Decho TV), and fee for service television network (55 channels of Cable TV) that broadcast tutorial videos 24 hours a day and seven days a week. In terms of broadcasting schedule, new lessons are played from 8:00AM to 12:00AM and the same contents are broadcast again from 12:00AM to 8:00AM (MoEYS 2020b, pp. 1-2). Having included multiple television channels and different television networks is likely an effective approach since it creates the flexibility for students to access the tutorial videos on the network that they have at home. Public television network (TVK2 Channel) is available nationwide and it is free of charge.

As mentioned in the literature review, the governments of Pakistan, Indonesia, Thailand, and Australia have adopted the TV approach to provide education during the pandemic (Global Partnership for Education 2020; Moore 2020; Techakitteranun 2020; Uzair 2020). The Cambodian government approach of using TV for broadcasting is quite similar to Pakistan where teaching

programs are broadcast daily for all grades from kindergarten to high school levels (George 2020). In Australia, on the other hand, the educational videos are broadcast on TV in the state of Queensland for two hours a day for three days a week (Moore 2020). Nonetheless, the Indonesian government uses contents from Netflix to broadcast on television, while in Cambodia, Pakistan, and Australia, the tutorial videos are made by their respective education departments. In this case, the Cambodian government has worked collaboratively with UNESCO to create teaching videos for all grades based on the national curriculum, which assures the appropriateness of teaching contents for students to sharpen their knowledge and be ready to move to the next level in their academic journey irrespective of the school closures during the pandemic.

Despite its main advantage that television can reach out to most families, broadcasting on TV has its own limitation. Television requires electricity to operate. In addition to not being reliable, electricity supply in Cambodia is not available in many rural and remote communities. Cambodian's electricity is partly generated within the country and partly imported, with the capital city of Phnom Penh alone consuming up to 90 per cent of the country's electricity supply (Open Development Cambodia 2017). Due to the limitation and expense of electricity supply, the number of people in rural areas still using biomass as an energy source in homes amounts to 87 per cent (Han, Kimura & Sandu 2020). For those who have no access to the electricity grid, they are still using portable batteries to operate their televisions. Consequently, it can be seen that poor electricity infrastructure can limit television broadcast to many rural communities and interrupt student learning especially for those living in remote areas. Therefore, those students might not be able to take advantage of their learning from the delivery of education via television during the pandemic, in spite of the government's best efforts.

Another drawback of broadcasting on TV is that the tutorial lessons are a non-stop which are not possible for students to pause or replay if there are lessons or sections they do not understand. If the students want to watch the same lesson again, they must wait until after mid-night when all the programs are re-broadcast. Also, in most families in rural areas there is only one television in a house; hence, watching a tutorial lesson on television after midnight would interrupt the sleep of other family members. Therefore, television at once offers opportunity for broader delivery of education, but not for everyone, which is a matter for the Cambodian government to consider and address as soon as possible. Otherwise, there are obvious inequalities and inadequacies in the delivery of education to those rural communities by any available method, including television.

4.2   Other Limitations

In addition to the respective weaknesses of each online learning platform, they share a number of other common challenges, especially in relation to ICT structure and students' attitude. In the case of Cambodia, online learning is quite challenging due to the limited ICT structure, especially for those who are in remote areas where internet access is limited. In some areas, even electricity is not fully available, and people in disadvantaged communities may not own electronic devices, such as a computer or a Smartphone, that are required to access the online learning materials. This finding is consistent with several other studies that have been discussed in the literature review chapter, which claim that ICT structure is required to make online learning possible. Numerous studies in the global context have shown that the main obstacles to online education are the slow speed of the internet, having a computer at students' homes, and limited resources available to academic staff, such as training and access to advanced technology (Allen & Seaman 2008; Rao 2011; Sun et al. 2008; Wan, Wang & Haggerty 2008; Zoroja, Skok & Bach 2016). Moreover, not only students are affected by the limitation of the ICT structure, but the teachers also experience difficulty. As discussed in section 3.5, many Cambodian teachers have limited knowledge of ICT. They have more challenges in adopting new technology when it comes to online and distance learning, which could potentially discourage them from accepting online learning over traditional classrooms in the future. This finding aligns with the claim of Katsikas et al. (2006) and Zoroja, Skok and Bach (2016), stating that the low level of computer literacy, low level of e-learning awareness, poor internet services, and low quality of software are the critical challenges to the acceptability of online teaching technology. This may be especially true for teachers who have had a bad experience using online teaching software and, therefore, without support may be reluctant to use online teaching again in the future.

Another disadvantage of online learning for both teachers and students is that it is primarily a one-way communication system from the teacher to the student. The absence of two-way communication in online teaching means there is limited interaction between students and teachers compared to the traditional classroom where teachers can monitor students' academic performance and provide support in a timely manner. Although students needing regular, direct support from teachers might struggle with distance learning, the online learning mode of teaching delivery could be more effective for self-regulated learners who are able to manage their time, motivation, and physical learning environment. Still, it might not be beneficial for those who require more direct assistance from teachers in traditional classrooms (You & Kang 2014, p. 126).

This finding suggests the existence of further inequities in the current practices of online education delivery in Cambodia where students can receive little individual support and guidance from teachers.

Another limitation in Cambodia's online education system is that MoEYS has limited control in content management on the videos uploaded into public hosting platforms, such as Facebook and YouTube, due to strict rules imposed by the companies owning the platforms. For instance, Facebook and YouTube strive to promote original content creators and have taken actions against pages and channels that breach their terms of services, especially on copyrights. This had already happened with the YouTube channel of MoEYS which resulted in the inaccessibility of uploaded tutorial videos.

4.3   Discussion

The education response of the Cambodian government during the COVID-19 pandemic consists of online teaching delivery and television broadcasting. The analysis conducted in this research project of the learning platforms—Facebook page, YouTube channel, E-learning, and television broadcasting—shows that these platforms have both strengths and limitations. In terms of the strengths, the online learning platforms allow the greatest majority of students to access learning materials remotely anywhere anytime during the school closure from the pandemic. Among the four platforms, Facebook page is the most popular due to this platform being widely used in Cambodia for personal, business, and working communications. As results from this analysis has shown, tutorial contents posted on the Facebook page received remarkable levels of interest with a total view of 14 times and 41 times higher than the total number of students in primary school and secondary school levels, respectively. Television, on the other hand, is free of charge and very accessible as analysis of statistics shows that more than 95 per cent of Cambodians have TV at home and use it primarily for following news and entertainment. This analysis, therefore, demonstrates that Cambodia's response to education delivery, using a variety of platforms and methods, has been effective in reaching the broadest audience in as efficient and effective a combination of methods as has been possible.

Even though there are many strengths of the Cambodia education approach, there are also limitations, and the most evident weakness is the poor ICT infrastructure, which does not have a wide enough reach to include many rural and remote communities. As discussed in the literature review, the ICT challenge is an issue that all countries, not just developing countries but also

developed countries such as Australia, are experiencing. The results of the learning platform analysis clearly show that each learning platform has its strengths and limitation, which is one reason the Cambodian government introduced four different platforms aiming to provide more options for students who have limited resources so they can still access education during school closures. In this regard, television has consistently been shown to work well in Cambodia and to have the broadest acceptance among international education programs in other nations as the most universally feasible and effective method of teaching delivery during the pandemic (Global Partnership for Education 2020; Moore 2020; Uzair 2020).

Each country has its own challenges, particularly in the developing world, and has been using appropriate action to solve its problems of online learning delivery. Even in Australia, which is considered a developed country with very advanced technology and world-class education that attracts international students globally to study at universities, there has been difficulty delivering online education during the pandemic. For example, only 40 per cent of disadvantaged families across Australia have access to the internet, which is why the department of education in the state of Queensland decided to adopt TV as one of the learning platforms (Moore 2020). Due to these challenges, Brown et al. (2020, p. 1) claim that almost half (46 per cent) of Australian children and young adults are at risk of an adverse effect to their educational outcomes by being physically detached from school. Similarly, the result from the Australian Education Survey by the University of Melbourne in 2020 found that Australian primary and secondary students are experiencing learning loss due to online learning, and a significant percentage of students from these two levels are not attending the online classes as scheduled (Ziebell et al. 2020, p. 4). Therefore, it is evident that ICT structure and lack of engagement of students with online learning is a global problem that many countries, including developed or developing, are experiencing during the pandemic.

Given the developing status of the country and the limitations of its ICT infrastructure, the education response in Cambodia has been remarkable in the sense that the country has still been able to provide a swift response by adopting available technology to ensure students can continue to learn while their schools are closed.

4.3.1 Confirming with other Scholars

The findings in this research have confirmed the claim of several scholars mentioned in the literature review.

- The online learning delivery in Cambodia has some strengths and limitations. The strength is online learning expands the reach of more students, which is in alignment with the claim of Iqbal and Ahmad (2010). Regarding the limitation of Cambodian education response, this study finding is in agreement with a number of scholars that ICT infrastructure is critical for online learning to take place (Allen & Seaman 2008; Rao 2011; Sun et al. 2008; Wan, Wang & Haggerty 2008; Zoroja, Skok & Bach 2016).

- The finding of the highest number of video views on Facebook page of grade 9 and 12 suggests that these graders are studying more diligently to prepare for their national exam. This finding confirms the result from DiVall and Kirwin (2012) study, which concluded that students would use Facebook more intensively to access learning materials of the associated subjects that will appear in their exam.

- Children of the families living in socio-economically advantaged areas would likely benefit more from online education since they are better able to afford computers, Smartphone, and internet services to access online learning materials. This finding is similar to Drane, Vernon and O'Shea (2020) who claim that 90 per cent of advantaged houses in Australia are connected to the internet, which enables students in those households to benefit more from online learning. Likewise, Hossain (2020) similarly concluded that, in Vietnam, online learning primarily benefits the rich people, but not poor people in the underprivileged communities. Hence, the students who are in remote areas, especially those who are in resources limited settings of developing countries, such as Cambodia, Pakistan, Indonesia, Nigeria, Thailand and Vietnam, are unlikely to be able to maximise the benefit from online learning platforms due to limited access to the internet (Allen & Seaman 2008; Hossain 2020; Rao 2011; Sun et al. 2008; Wan, Wang & Haggerty 2008; Zoroja, Skok & Bach 2016).

- Cambodian teachers have challenges in adopting new technology when it comes to online/distance learning, which could potentially discourage them from accepting online learning over traditional classrooms in the future. This finding aligns with the claim of Katsikas et al. (2006) and Zoroja, Skok and Bach (2016), stating that the low level of computer literacy, low level of e-learning awareness, poor internet services, and low quality of software are the critical challenges to the acceptability of online teaching technology. This is especially true for those teachers who have a bad experience in online

teaching software and, without training support and professional development, may be reluctant to use online teaching again in the future.

4.3.2   New Findings

Some evidence from this research has resulted in new findings that significantly contribute to academic literature related to online education in Cambodia during the pandemic:

- Using social media platforms solely for delivering online education may not be a practical option due to the risk of losing access to contents resulting from copyright infringement against the terms of social media platform services. For example, the original YouTube page that MoEYS used initially to introduce online learning was terminated later, resulting in disruption of access to uploaded tutorial videos (see Picture 4).

- Adopting a combination of different platforms to deliver online learning is likely a more effective approach since it allows students to have more options to access the learning materials based on the resources they have available. Also, delivering online teaching by multiple methods minimises the risk of learning disruption if a particular platform becomes inaccessible, since students can move to alternative resource for their studies.

- Each platform used for online learning delivery should stand alone and not be inter-connected due to the risk if one platform becomes inaccessible that would affect the second platform. For example, in this study it was demonstrated that, when the E-learning platform embedded video links from YouTube channel, the video tutorials on E-learning were not accessible after the YouTube channel associated account was terminated (see Picture 4 and Table 5). Therefore, investing in a video hosting service instead of using a public hosting platform appears to be an effective and secure solution to this risk since the administrator has more control over contents management and access.

- The analysis shows that the E-learning platform that the Cambodian government introduced is better than Facebook, YouTube, and television, because it is user friendly, and the contents are grouped into their respective grades, which enables students to more easily find the videos for their class and to replay lessons for enhanced learning (see Picture 5).

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- For Cambodia, the social media platforms, especially Facebook, have an important role in delivering education during the pandemic. A great majority of the Cambodian population is familiar with Facebook and have been using this application for personal, business, and working communications. Hence, using the most popular social media tool for online learning delivery should be regarded as immediately acceptable to a wide audience and therefore is an effective approach.

CHAPTER 5. CONCLUSION, DISCUSSION, AND THE WAY FORWARD

This research has aimed to examine and understand the Cambodian government's approach and response to ensure the continuation of education for students during the COVID-19 global pandemic. The study sets out two specific objectives: (1) to evaluate online learning platforms and other educational initiatives by the Cambodia government in response to learning disruption caused by the COVID-19 pandemic; and (2) to assess strengths and weaknesses of those online learning platforms. Specifically, this research attempts to answer the following questions: 'How has the Cambodian government assured the continuation of education in Cambodia during the COVID-19 pandemic?', and 'What are the strengths and limitations of the approach taken by the Cambodian government in response to the need for general education during the global pandemic?'

Based on the research questions and aim, a review of academic literature was conducted to understand the current knowledge of approaches to online education during the pandemic. Two main observations can be drawn from recent online learning literature. First, a growing number of countries have embraced online learning as a complementary tool to enable children's education. Online learning has become even more popular during the COVID-19 pandemic. While sharing similar objectives, which are to complement conventional classroom learning, the application of online learning platforms varies from one country to another. While some countries rely on E-learning websites and TV to deliver teaching, others use Facebook and YouTube Channels to stream teaching. Second, there are few studies of online learning in Cambodia. This research therefore remedies and helps to fill the research gap in the international development literature by evaluating online learning platforms in Cambodia and assessing their respective strengths and weaknesses.

Online learning is a part of Cambodian education policy that has become increasingly vital during the pandemic. It was implemented as a way to enhance access to education. As shown in Chapter 3, the Cambodian government introduced four platforms, which are Facebook page, YouTube channel, E-learning website, and TV, to assure education continuation during the COVID-19 pandemic. A systematic review and a comprehensive assessment of the strengths and weaknesses of online learning tools in Chapter 4 showed that each learning platform has its strengths and limitations. This research finds that Facebook has received the most interest from students among the four platforms, especially for those who have access to the internet and computer or

Smartphone. However, using social media alone for delivering online education is not sufficient to provide equitable, consistent, and comprehensive access to all students in Cambodia. Other platforms, such as TV and website, provide students more options to learning and resources. In particular, TV is likely to be more beneficial for those who live in remote areas where the internet is limited or not available. Socio-economic considerations are also important, since many families may not be able to afford computer technology or digital communication devices needed to access online learning programs.

Overall, this research concludes that the main strength of all electronic and technology-based learning platforms available in Cambodia is their capability to expand access to education to most parts of the country. However, the main challenges are the limitation of ICT infrastructure, limited internet connection, and limited access to electronic devices, such as computers or smartphones to support online learning. Likewise, evidence from the literature review shows that lack of ICT structure is a global problem that many countries, particularly developing nations, are experiencing in this early phase of implementing online learning during the pandemic. In addition, the findings of this study conclude that Cambodian teachers have significant challenges in adopting new technologies necessary for online/distance learning. These challenges could potentially discourage teachers from accepting online learning or blended learning over traditional classrooms in the future. Hence, the decision by MoEYS to continue providing more ICT training for teachers would likely help overcome these challenges in the future. Thus, the way forward is clear: the Cambodian government must resolve these key issues as quickly as possible.

Finally, this study has found strong evidence that online/distance teaching and learning in Cambodia has been effective in complementing or substituting classroom education during the pandemic and thus has contributed to continuous education for young people in the country. This is an important conclusion because, while this study was being finalised during April to June 2021, the spread of the COVID-19 disease in Cambodia increased and the seriousness of the health crisis escalated rather than having been brought under control. At the time of completion of this study, mid-June 2021, there were 44,711 active cases in Cambodia and 475 deaths from the disease had been recorded (Worldometer 2021). All schools in Cambodia remained closed with no indication of when normal classroom learning will recommence. Therefore, the government's online/distance learning programs will continue to be vitally important for some time to come.

Hence, it is recommended that further research be undertaken urgently to study the effectiveness of online learning and the usefulness of the various platforms available to Cambodian students for continuing their learning during this unprecedented health crisis. In addition, the effect of the closure of schools and different learning methods on student academic performance should be investigated and a determination made of next steps to be taken in support of students once education reverts to classroom teaching.

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