Asian Journal of Distance Education

Emergency Remote Education: Experience from Sri Lanka during Covid-19

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Abstract: This study explores the Emergency Remote Education (ERE) experience in Sri Lanka using mixed method research to understand how ERE was offered in Sri Lanka and what this homeschooling experience was like for both parents and teachers. An online survey (N=153) of parents and six semi-structured interviews with a purposive sample of teachers were used to gather data. The findings suggest, despite all the hurdles faced, the teachers have offered some form of ERE to their pupils. However, the uptake of ERE has not been satisfactory in many instances. In resource rich settings, ERE has been more successful. Parents in the Western province, where computer penetration is highest in the country, were more satisfied with the ERE provision than parents in other parts of the country. While online offering of ERE may seem viable or desirable in certain areas or circumstances, large parts of Sri Lanka are not prepared for online educational delivery due to the multifaceted digital divide, which should be considered in any future implementations of ERE.

Keywords: Emergency Remote Education, School Closure, Covid-19, Sri Lanka, Lockdown

Highlights

What is already known about this topic:

- Emergency Remote Education (ERE) is different to distance education because the former is a temporary shift of instructional delivery to a different medium whereas the latter is planned and designed to deliver the education at a distance.
- Owing to the disparities between the urban, rural and estate sector in Sri Lanka there is a wide difference between the availability of devices, connectivity and digital literacy leading to a digital divide in Sri Lanka.

What this paper contributes:

- Parents in the Western province were comparatively more satisfied with ERE their children received.
- There is statistically significant association between the amount of learning material provided by the school and perceived progress children made during the ERE period.
- In resource rich settings, ERE has been more successful.
- Sri Lanka has a multifaceted digital divide, with statistically significant difference in resource distribution between Western province and other areas of the country.

Implications for theory, practice and/or policy:

- When selecting technology for ERE delivery it is necessary to consider equitable access.
- Better infrastructure (including digital infrastructure) is necessary for the development of rural areas.

Published by EdTechReview (ETR), New Delhi, India
ISSN 1347-9008 http://www.asianjde.com/

Introduction

The contemporary world is a highly connected 'Global Village' (McLuhan, 2001); this interconnectedness provides advantages as well as great disadvantages as shown by the spread of the pandemic, Covid-19, in 2020.This higher level of connectedness between continents increased the risk to the whole society and it is an accepted part of our modern life. Risk is a driving force for social change, but it also gives power and advantage for those who can avert and manage the risks (Beck, 1992).

As the pandemic swept through continents, many countries closed their borders and imposed strict lockdowns to stem the rising infection rates, resulting in school closures (in over 100 countries) leaving over a billion learners out of school (Onyema et al., 2020). Sri Lanka closed its international airports to commercial flights together with seaports at the beginning of the pandemic in March 2020 and imposed varying degrees of lockdowns and curfews both nationwide and for specific districts/provinces as cases were reported. Designated infectious disease hospitals and quarantine centres were used to house patients and their potential contacts/ repatriated Sri Lankans. All government schools (and other education provisions) in Sri Lanka were closed from March 13 to June 2020 and in July 2020 some year groups (grades 5, 11 and 13) could resume academic activities (Erandi et al. 2020); though they were again disrupted with various outbreaks in the island. However, some schools in the Western Province (Kalutara, Colombo and Gampaha districts) have been closed for pupils for a large part of 2020.

All around the world digital technologies were heavily relied on during the lockdowns to deliver ERE. Six months into the pandemic, a UNESCO background paper reports:

> "[i]n an attempt to respond to the disruption, governments positioned technology as the primary—and, in many contexts, only—channel to maintain the continuity of formal learning" (Tawil, 2020, p. 2).

The report further assets that:

> "[w]hile there have been various technology-enabled distance learning responses, governments focused most of their energies on connected digital technologies, even though the reach of these technologies is far from universal. Today half of the world's population (3.6 billion people) still lack an internet connection" (Tawil, 2020, p. 2).

The authors' prior research observing online distance education in Sri Lanka (Liyanagunawardena, 2012; Liyanagunawardena et al., 2013; Liyanagunawardena et al, 2014) highlighted a stark digital divide within the country, with significant different experiences for learners largely based on geographic locations. The overarching research question of this case study research (Yin, 2003) was to identify the experiences of Sri Lankan school children, along with their families and teachers during the Covid-19 lockdown.

Emergency Remote Education

Emergency Remote Teaching (ERT) is a term proposed by Hodges et al. (2020) to describe the delivery of education during the lockdown circumstances. Though Hodges et al. (2020, Para. 13) addressed the problem from a university perspective, their definition is applicable to schools too:

> "In contrast to experiences that are planned from the beginning and designed to be online, emergency remote teaching (ERT) is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face … courses and that will return to that format once the crisis or emergency has abated" (Para. 13).

Bozkurt et al. (2020) on the other hand proposed the term Emergency Remote Education (ERE) arguing that the terms used in different countries for the delivery of education during the Covid-19 lockdowns were derivations of distance education but that they did not capture the essential difference between emergency remote education and distance education. They argued that distance education is an *option* while the ERE is an *obligation*. In this paper authors use the term ERE to refer to the remote educational experience of teaching and learning during the Covid-19 school closure time.

There are reports of school teaching that has occurred remotely in a variety of circumstances. For example, when it was unsafe to attend schools, girls in Afghanistan received their education remotely (Davies, 2010). Virtual Schools have existed in North America from the 1990s offering accredited education to rural children or supplementary education to gifted children (Barbour & Reeves, 2009). Children living in isolated places in Australia were offered distance education opportunities from the early days of a reliable postal service (Stacey, 2005).

When disasters have necessitated school closures, these have been short-term or other mitigation provided. For example, following Hurricane Katrina in the US, in 2005, large numbers of Louisiana and Mississippi residents were evacuated to safety. Within a month of relocation, the children were attending new schools in their temporary homes (Barrett et al., 2008). In New Zealand following the Christchurch earthquake of 2011, most schools were closed for three weeks, and some children who were with badly damaged schools had to be offered new school places (Johnson, 2014). In Taiwan and elsewhere in Asia and beyond, during the 2009 H1N1 influenza pandemic, various schools in affected areas were closed for short periods (Chen et al., 2011; Klaiman et al., 2011). In Sri Lanka, during disasters (such as 2004 Asian Tsunami), insurgencies and the time of heightened terrorist activities schools have been closed temporarily in the affected areas. However, the Covid-19 school closures in Sri Lanka have been nationwide and prolonged requiring the provision of ERE.

Academic literature is starting to appear relating to educational experiences around the world during Covid-19, initial work focussed on higher education, and later schools, with most studies focussed on older pupils (Bond, 2020). In the UK, in response to the pandemic, the Office for National Statistics (ONS) have conducted weekly Opinion and Lifestyles surveys providing a snapshot of daily life including experiences of homeschooling (ONS, 2020). However, the type of questions employed are largely quantitative and so do not provide a rich picture of experiences (Liyanagunawardena & Williams, 2021).

Digital Inequality

The term digital divide was initially used to refer to the gap between technology 'haves' and 'have nots'. It has been argued that the "digital divide is first and foremost a question of access to infrastructures" (UNESCO, 2005, p. 29). This conception of digital divide as a sole material deficit is now challenged (Warschauer, 2003; van Dijk, 2005). Warschauer (2003) argued that,

> "meaningful access to ICT comprises far more than merely providing computer and internet connections. Access to ICT is embedded in a complex array of factors encompassing physical, digital, human and social resources and relationships. Content and language, literacy and education, and community and institutional structures must all be taken into account if meaningful access to new technologies to be provided" (p. 6).

Attewell (2001) argued that there are two levels to the division: first relating to material access and second relating to the "social differences in the ways computers are used at home and school" (p. 253). He pointed out that not all computer/internet users gained the same level of educational benefit from it. He suggested that it was more likely for poor pupils to use computers at home for playing games with minimal adult supervision. At the same time, their peers, pupils from affluent families, were

likely to thrive using educational content with more adult involvement. Thus, he argued that the way technology was used could exacerbate already existing divides.

> "It is therefore naive to expect the provision of computers to reduce educational differences among children in any simple or automatic way. On the contrary, computers may, at least initially, exacerbate existing educational differences between social classes" (Attewell, 2001, p. 257).

While the schools were closed, teachers were expected to provide ERE for the children and this, in many countries, relied primarily on online provision (Tawil, 2020). The provision of online learning requires at least physical resources, connectivity as well as digital skills and literacy on both ends: teachers and pupils. The stark digital divide, those who have access to electricity, internet infrastructure, data services, and devices as well as skills to make use of digital technologies for teaching and learning purposes, was apparent from recent statistics. For example, 95% of North Americans, and only 39.6% of Africans had internet access (Internet World Stats, 2020). In a resource limited environment, using technologies not widely available can leave many pupils at a disadvantage.

In Sri Lanka, most schools are state schools funded by the government but there are fee-levying private and international schools. International schools are setup as private businesses and are not regulated by the Ministry of Education. They generally prepare pupils for international exams such as "London O Levels" (UK GCSE exams). There are divisions within the state schools: national schools are funded and administered by the Ministry of Education of the central government as opposed to provincial schools, which are run by the local provincial council. According to the school census 2016, there were 353 national schools, 3.5% of all state schools, catering to 16% of state school pupils (Ministry of Education Sri Lanka, 2016). It also showed that 34% of Colombo and Galle district pupils attend national schools as opposed to 6% of Nuwara-Eliya and Kilinochchi district pupils, indicating differential distribution of national schools within the country. National schools are generally considered to be resource rich, and they cater to many pupils (3,000+). Parents and "Old Students' Associations" in these schools contribute considerably to the school's development. Therefore, it is possible that there is differential ERE offerings depending on the school's resources.

ACTIONS is a framework for technology selection and application in Open and Distance Learning (ODL) (Bates, 2005). ACTIONS stands for Access, Costs, Teaching and learning, Interactivity and user-friendliness, Organisational issues, Novelty and Speed; factors presented in their order of priority. In this framework, Access is the most important criterion for technology selection because widening and increasing participation is a priority in ODL. Given that ERE is required to reach out to all pupils who are out of school, it can be inferred that this should be a priority for ERE as well. As a rule of thumb, a technology can be considered a suitable medium of delivery if at least 70% of the target group have access to it (Bates, 2005).

In Sri Lanka, computer and internet penetration has slowly increased in the past decade. For example, desktop or laptop ownership in 2009 was 11.4% (Department of Census and Statistics cited in Liyanagunawardena, 2012) as opposed to 22% in 2019. However, the percentage of households owning a desktop or laptop vary widely between urban and rural areas. For example, the 2019 census reported 38% urban, 19.7% rural and 4.6% estate (areas of all plantations which are 20 or more acres in extent with at least ten resident labourers) households owned a computer or laptop. More granular information of computer ownership in Sri Lanka is presented in Table 1 below; an extract from the Department of Census and Statistics (2019).

Table 1. Computer ownership in Sri Lanka % (Source: The Department of Census and Statistics – 2019)

Sector	2016	2017	2018	2019
Sri Lanka	21.6	22.8	22.3	22.0
Urban	35.4	38.2	37.5	38.0
Rural	19.6	20.6	20.0	19.7
Estate	6.1	4.5	4.2	4.6

As can be seen the estate sector households fall far behind both in terms of computer ownership statistics and other socio-economic data. The estate sector household incomes are much lower compared to other parts of Sri Lanka (Table 2). For example, in 2016, the median urban household income was Rs 57,833. On the other hand, an estate sector household's median income was only Rs. 29,134 – almost half that of an urban household's income reducing the purchasing power of an estate sector household (£1 ~ Rs. 280).

Table 2. Household income Rs. for 2016 (Source: Central Bank of Sri Lanka – 2020a)

Household income	Sri Lanka	Urban	Rural	Estate
Mean	62,237	88,692	58,137	34,804
Median	43,511	57,833	42,133	29,134

The percentage of households with internet access in Sri Lanka has increased over the years. For example, in 2001 there were 0.7% of households with internet access (Department of Census and Statistics Sri Lanka 2004, Cited in Liyanagunawardena, 2012), which increased to to 30.3% in 2019 (The Department of Census and Statistics, 2019). Again, the difference between urban (47.4%), rural (27.5%) and estate (12.2%) areas with access to the internet is visible (Department of Census and Statistics, 2019).

The Department of Census and Statistics in Sri Lanka (2019) defines computer literacy as:

> "A person (aged 5-69) is considered as a computer literate person if he/she could use [a] computer on his/her own. For example, even if a 5 years old child can play a computer game then he/she is considered as a computer literate person".

Under this definition, 30.8% of Sri Lankans were computer literate: 43.6% urban, 29% rural and 12.6% in estates (Department of Census and Statistics, 2019). The highest level of computer literacy was reported from the Western province (44.1%) with the lowest level reported from Eastern province (15.7%).

Previous efforts of using online technologies to increase access to post-secondary education in Sri Lanka through the Distance Education Modernisation Project (DEMP), in 2003, funded by an Asian Development Bank loan, was found to be less effective and less efficient (Asian Development Bank 2011, p.10). There is compelling evidence how the lack of access to internet and computers and various policies imposed by access centres affected students who were registered on distance education programmes (Liyanagunawardena, 2012; Liyanagunawardena et al, 2014). In this backdrop, current paper explores the experience of both parents ("parent" is collectively used to refer to the person who is the parent or carer of a young person) and teachers during the period ERE was implemented in Sri Lanka due to Covid-19 lockdowns.

Methodology

The project obtained ethics approval by University College of Estate Management's Research Committee. This case study employed mixed method research (Creswell, 2003) to gather rich data: an online survey to gather quantitative and qualitative data from a wider group of parents. It was part of a wider "eLearning in Challenging Times" research project, which explored ERE during the Covid-19 lockdowns (Liyanagunawardena, 2020). Ideally a paper-based survey would also have been used but

the conditions presented by the pandemic made this impossible. However, in the circumstances posed by the pandemic, including severe disruption to postal services in Sri Lanka, and the inability to distribute printed surveys door-to-door or at gatherings, this was not a viable option.

A purposive sample of schoolteachers was selected to ensure representation of those who may not have access to an online survey. Semi-structured remote interviews (audio calls and text based) were used to capture emerging topics, including the teacher's experiences in their school and with their own families.

Thus, the survey data presents parents' point of view and interviews present teachers' point of view (all of the teachers were parents to one or more children either in school or college), which together creates a more complete picture of the situation in Sri Lanka during the lockdown ERE period. Note that the authors have used quotes as provided to give the participants a voice and these may contain spelling and/or grammar mistakes.

Questionnaire

A self-administered online questionnaire was used as the main data collection tool, which was promoted via social media (such as LinkedIn, Facebook, WhatsApp and Twitter). The survey was part of a larger study that gathered lockdown homeschooling experiences, the UK ONS surveys (ONS, 2020) was used as a starting point for identifying questions and wordings relating to quantitative data. This questionnaire was adapted and translated to Sinhala – the local language spoken by the majority of Sri Lankans. The questionnaire therefore offered instructions, questions, and answers in both English and Sinhala to the user.

The questionnaire contained several sections. The first question, "Which country do you live in?", was a compulsory selective question (other questions were non-compulsory) where non-Sri Lankan respondents were redirected to end the survey. There were 170 responses out of which 153 were from the Sri Lankan residents (N=153). First section of the questionnaire was general questions about the household; the second section was about their use of technology; third section was to determine the education before lockdown as a baseline and the fourth section was about education during the lockdown. Altogether there were 32 questions (some questions contained multiple sub questions) and the questionnaire used in this study is provided as Appendix 1. The questionnaire was piloted with five parents (one who also was a schoolteacher) to identify any issues with questionnaire wording and the time taken to fill it. This small group provided detailed feedback, which was utilised to refine the questionnaire before the data collection.

Interviews

Interviews (N=6) were conducted by the first author in the local language or English as preferred by the interviewee. The author took extensive notes during the interviews when they were not recorded. The notes were then shared with the interviewee for respondent validation.

Data Analysis

Survey data was analysed using Microsoft Excel and OnlineSurveys (https://www.onlinesurveys.ac.uk) analysis tools applying appropriate statistical methods (including Chi-square method). Open answer questions in the questionnaire and interview data were analysed in a systematic way. Where the answers were provided in Sinhala language (some respondents had used English letters as phonetics to present Sinhala statements) these were translated by the first author before the analysis. A sample of the responses were first studied by both authors. Manual content analysis was used to categorise response into identified emerging themes. The remaining responses were then classified using the identified categories as well as any other new categories that emerge from the data. The other author then independently verified these. The authors discussed and agreed on the outcome when

categorisations did not match. Similarly manual sentiment analysis was also applied to categorise expressed opinions.

Validity and Reliability

The survey was used to reach wider group of people to gather their experiences, while the interviews were conducted with a purposive sample of teachers to gather experience from a variety of settings. Interview respondents were contacted for respondent verification when clarifications were needed.

Findings and Discussion

This section is divided into three main sub-sections:

- Parents' perspective – presenting the finding based on both quantitative and qualitative data provided by anonymous survey responses.
- Teachers' perspective – based on semi-structured interviews with a purposive sample of teachers across Sri Lanka's schools.
- Comparison – critically comparing and contrasting findings from parents and teachers, alongside related literature.

Parents' perspective

Demographics

From the survey 38.3% (57) households consisted of two adults while 59.2% households (88) reported three or more adults. 36.9% (55) were educator households where at least one adult works in the education sector were reported. 67.9% of the respondents had graduate or higher degree education (Table 3). 21.3% of households (32) reported at least one disabled adult in the household requiring extensive care. However, only 2% (3) households reported of children with special educational needs or disabilities. This could be due to undiagnosed conditions and or unwillingness to disclose because of social stigma as people with disabilities are 'hidden from the rest of the society' (Smith et al. 2012, p7).

Table 3. Participant demographics – Education

Education level	Percentage
No formal qualifications	2 (1.6%)
GCE Advanced Level	27 (21.1%)
Graduate degree	35 (27.3%)
Postgraduate degree	52 (40.6%)
Other	12 (9.4%)

More than half of the respondents (90, 59.3%) were from the Western province (Colombo 42.1%, Gampaha 8.6% and Kalutara 8.6%). Only two other districts had more than 10 responding to the survey: Galle 27 (17.8%) and Kurunagala 15 (9.9%). This could be at least partly explained by the computer ownership and access to the internet to take part in the survey: Western and Southern (includes the district of Galle) provinces reported higher computer ownership than other parts of the island. Only six participants (4%) believed that they lived in a rural area. Again, this can be linked back to the ownership of computers and access to the internet to take part in this survey.

Not all respondents provided details of their children's year groups. Out of the 95 respondents who provided details, there were at least 71 children in primary school and 78 in secondary school years. There is a sizable proportion of children (43%) who attend international schools (36, 24.2%) and private and semi-government schools (28, 18.8%) represented in the sample. There are 10,168 government schools in Sri Lanka with 796 Pirivena schools (mostly for Buddhist monks) and 118 private and special schools (Central Bank of Sri Lanka, 2020b). Only 3.13% of Sri Lankan pupils

attend private and special schools though in the survey sample it is 43% indicating that the sample is likely to represent a more affluent group of the Sri Lankan society. This is likely to be due to the online medium of data collection. However, by selecting a purposive sample of teachers from a variety of school settings, the research captured the vivid experiences of the communities served by the various types of schools.

Resources

9.9% (15) of the respondents felt that they did not have adequate space at home for children to learn remotely as well as the adults to work from home during the lockdown. In terms of the availability of devices responses received are shown below:

- We have more devices than people in the house 12.1%
- We have enough devices for all of us to use 48.0%
- We share devices and have enough time on them for everyone 27.7%
- We share devices and we don't have enough time on them for everyone 10.8%
- Other 1.4% who reported that they were using a smartphone.

Cross-referencing the responses to where respondents live showed that there is a statistically significant difference (Chi-square test p-value = 0.017) between the residents of Colombo and other parts of the island in terms of their access to devices.

There were 94.7% of respondents reporting home internet connectivity. 40% ADSL (Asymmetric Digital Subscriber Line) connectivity; 24.3% Optical fibre connectivity. The rest were connected using mobile internet. Only 15.4% (22) respondents reported unlimited access to the internet. Out of those who were on limited data allowance 44.2% reported that this was not sufficient. 32.9% (47) reported insufficient internet bandwidth (speed). Common complaints about internet connectivity were no connectivity during power outages (which can be common in Sri Lanka); connection quality (interruptions, poor transfer rate), and the cost of connectivity.

There were only 55 households (36.4%) with printers. There is also statistically significant evidence of association between where people live and their access to printers. Western Province dwellers were more likely to own printers (Chi-square test p-value = 0.072). None of the respondents identified themselves as living in rural areas owned a printer. These quotes from respondents showed the importance of printers during the ERE period:

> "We didn't had [have] a working printer before covid period. Due to the large amount of homework sent for the kids we bought a new printer..."

> "Teachers used to send cut and paste type lessons and Essay type of questions which are harder to read and stressful for them in a mobile screen. So print them is more easy for them. (In other hand, some of these tuts [tutorials] isn't optimized for printing. Large color patches like .ppt slides shared as it is.)"

Participants of this survey reported a high level of competency with technology with only two users (1.3%) identifying themselves as struggling with technology use. Again, this is likely to be affected by the data collection method – to take part in the survey they needed to be comfortable with accessing technology.

Lockdown Homeschooling

During the lockdown, many households (77.2%) had at least one adult working from home. 123 respondents replied to the question whether the schools provided sufficient material for homeschooling. 17.9% (22) strongly agreed and 49.6% (61) agreed that the schools provided sufficient materials; however, 15.4%(19) disagreed with 1.6% (2) strongly disagreeing with the

remaining 15.4% (19) neither agreeing nor disagreeing. 119 replied to the question on how the materials were provided.

- Online video lessons (67) 43.8%
- Online materials where work was done online (54) 35.3%
- Online materials that had to be printed and worked on (45) 29.4%
- Using social networks (32) 20.9%
- Online tests (16) 10.5%
- Discussion forums (16) 10.5%
- Printed packs of material (12) 7.8%
- Other (8) 5.2%

Most parents (76.8%, 86) provided additional resources for their children. Many parents felt that their children spent less time on schoolwork than they would have at school (66, 59.5%) with 7.2% indicating that their children spent hardly anytime on schoolwork. 14.4% reported children spending more time than they would have at school and 18.9% reported about the same time as they would have at school. Most parents (71.5%, 78) have spent less than 3 hours a day helping all their children with schoolwork. However, a small minority 2.8% have spent over 10 hours a day helping their children with homeschooling.

Difficulties

54 respondents provided free text answers to elaborate difficulties they faced using the material provided to homeschool children. These were divided into the following five distinct areas, described in more detail below:

1. Timings and time management. In Sri Lanka, WhatsApp was used extensively as a tool to distribute learning materials to pupils. Parents who were working from home or have had to attend workplaces told of their frustrations to receive homeschooling materials on their mobile phones. While parents who worked from home (WFH) also were not always able to support their children with lessons.

> "...when we in the working places they send the messages through the phone and at that time we were unable to give that message to child"

> "Since we also WFH, we were unable to check whether they study n sometimes they were not concentrating to the lessons"

2. Connectivity**.** In Sri Lanka, many consider fibre connectivity to the internet as the gold standard. However, fibre connectivity customers of Sri Lanka Telecom (SLT), the leading provider of telecommunication services in Sri Lanka, complained that when power failures happen (unfortunately a common occurrence in Sri Lanka) they not only lost power but also phone line and internet connectivity.

> "Due to poor internet connectivity, power failures sometime child miss the lessons during the sessions."

> "Power cut. Technical problems. Not working microphone, not working earphones, etc..."

Insufficient data allowance was also an issue raised by many.

> "Not having sufficient internet data"

> "...every month while having a family package I had to purchase extra data for online classes"

The data services are offered in Sri Lanka based on time bands. For example, SLT offers an ADSL data bundle "Higher Education 1" package (10GB data) for a monthly rental of Rs. 390/= (about £1.40). However, only 4GB of this data can be used anytime and the other 6GB data can only be used during the off-peak hours of 00:00-08:00. Therefore, if the standard data allowance is exceeded during the daytime, even though there is another 6GB data left in the data package, this data cannot be used during the daytime for homeschooling. However, after the first lockdown telecommunication providers in Sri Lanka offered various packages targeted for homeschooling with unlimited access to Zoom and WhatsApp.

3. Resource Issues. Printing difficulties as well as device availability were common problems cited by many parents. Device issues were reported especially by parents with more than one child. When it was required to join synchronous lessons at the same time for several children it was a problem as most of the lessons were not recorded for later access.

> "As I don't have a printer at home printing problems were there"

> "Access to printing materials(ink) and stationaries."

4. Motivation and Distractions. Parents reported that it was difficult to motivate their children to stay in front of the computers and once they are at the computers they get distracted by other applications. They believed that because their children were not given much time on devices before the lockdown, the novelty of devices have excited them as well as distracted them from lessons. Some parents also believed looking at a computer screen for a prolonged period was harmful.

> "Keep them infront of laptop is difficult. Therir [sic] attention went away ..and no concerns to the lesson .skmetimes [sic] trying to move to YouTube and watch video/ play games"

5. Technical Difficulties. Parents reported technical difficulties they faced in organising content for their children. For example, one parent complaint of the difficulties they faced when the content sent as WhatsApp messages for several children had filled the mobile phone storage capacity. While others complained of the difficulties, they faced joining Teams or Zoom synchronous meetings.

Homeschooling Progress and Satisfaction

Nearly a half of the parents (48.2%, 54) felt their children were at a place similar to where they were when the schools were closed. 27.7% (31) felt the children had gone backwards while 24.1% (27) felt the children had made good progress. The satisfaction of ERE varied. 42% (47) were satisfied with the education their children received in the lockdown; 214% (24) were indifferent while 36.6% (41) were not satisfied.

There is strong statistical evidence of association between the amount of learning material provided by the school and perceived progress made during the homeschooling period (Chi-square test p-value = 0.000). There is also statistical evidence of association between homeschooling satisfaction and where they are located (Chi-square test p-value = 0.040) with nearly half of the Western Province participants feeling satisfied about the ERE experience (Table 4).

Table 4. Homeschooling satisfaction Western province and other parts of the country

Location	**Homeschooling Satisfaction**		
	Satisfied	Indifferent	Not satisfied
Western Province	34 (48.6%)	10 (14.3%)	26 (37.1%)
Other	13 (30.9%)	14 (33.3%)	15 (35.7%)

Teachers' Perspective

The detailed interviews conducted with teachers included:

- One national schoolteacher (Southern Province)
- Three state schoolteachers (two Western Province and one Southern Province)
- One vocational education teacher (Southern Province)
- One international (private) schoolteacher (Western Province)

These schools have approached ERE in a variety of ways depending on the resources available to the school, staff, and pupils. There seemed to have been very different approaches to ERE by government schools and private schools. The school's approach to ERE depended on the school leadership as well as what resources were available to school, teachers and pupils.

ERE Offering – Private Schools

The international schoolteacher interviewed was the sectional head of a leading, exclusive, international school in Colombo, with fees of Rs. 130,000 (£460) a term for a middle school pupil. Considering that the mean and median monthly household income of Sri Lanka is Rs. 62,237 (£221) and Rs. 43,511 (£155) respectively (Department of Census and Statistics Sri Lanka, 2016), it is likely that the households who send children to this school are in top income tiers and are likely to have ready access to devices and connectivity. When Sri Lanka went into lockdown, this school already had a Learning Management System (LMS) in place, but it was being used for management purposes (entering grades etc.) rather than interactive learning. Initially, the teachers provided revision materials on the LMS for their pupils during the first two weeks. In this time, the IT department of the school had secured Microsoft Teams software, created accounts for all (about 1,100 pupils) and gave basic training to staff. The teachers experimented with the software and shared their experiences with other colleagues making the learning curve faster for everyone. The school was one of the first to offer fully online school day for their pupils. The school offered online teaching to year groups and combined parallel classes to help with the logistics of delivery. Teachers also offered lessons from home, using Microsoft Teams and without switching on video (partly due to concerns of data limits and quality of connectivity).

The school only experienced a few issues with pupils being unable to join lessons mainly due to the non-availability of dedicated devices, e.g., when multiple siblings have had to join online lessons during the class time. In these instances, the school had offered parents the option to allow siblings to join synchronous lessons on alternative days so that the sibling missing lessons one day could catchup watching recorded lessons in the afternoon and join synchronous lesson the next day.

In general, the sectional head observed that slow learners and socially challenged pupils thrived through the lockdown working at their own pace. Above average pupils and pupils with involved parents too had done very well through the lockdown. However, pupils who needed constant supervision in class had gradually gone backward in the lockdown. Also, for younger age groups online learning was not a successful experience in her opinion. She also mentioned that the mock exams conducted as soon as the schools returned showed remarkably good results, better than what they had expected, and attributed this to learners being relaxed at home and not having other distractions or commutes.

She reported that she and her other colleagues received many more requests for private tuition lessons from parents of pupils who attend government schools. This is likely to be the case if parents were unhappy with the government schools' ERE provision.

ERE Offering – Government Schools

One theme that was common in all teacher interviews was that the teachers did not receive a Ministerial Circular of what action should be taken. The action taken by each school was determined by the head teachers, sectional heads, and subject leaders of the specific school. Here the difference

between resource rich national schools and other state schools was apparent. The teachers believed that the head teachers may have been instructed by emergency meetings conducted at provincial or divisional level. They described the information flow as chaotic and piecemeal.

Interviewees spoke of the difficulties they faced creating a list of pupils' contact details. Some schools delegated this responsibility to parent representatives to create class contact lists, while in other schools class teachers together with parent representatives created class contact lists as WhatsApp groups. When parents did not own smartphones and or their phone numbers were not known (in some cases mobile contact details have not been compulsory for school records while in others, teachers were unable to access the school registers due to lockdown restrictions) those children were left behind during the first national lockdown. Teachers spoke of the snowballing effort they employed in quickly collecting contact details for all the pupils' parents by asking children in class to find out their friends' numbers. When schools returned briefly in June, teachers created a more complete list of contact details that was used in later lockdown periods. One teacher spoke of her son's school (a national school) which offered email addresses to all children and used them to keep in contact and how it included all children during the lockdown. However, this was an exception.

Not having access to contact details for all pupils created an initial hurdle for teachers who had to source these using various methods. The methods implemented in sourcing contact details may be viewed unacceptable in parts of the world where there are strict privacy laws. However, teachers did this in good faith to offer ERE to their pupils.

Teachers were also asked to offer lessons using Zoom, however, none of the interviewees had used it before. While some schools arranged technology preparation days where IT teachers took the lead to train the other teachers, some schools have left it to staff to learn it by themselves. One interviewee said that her 13-year-old son was able to help her install the Zoom app and she learned how to use the app from her son but also attended the school's sessions to be more comfortable with the technology. They also spoke of elderly teachers who did not even know how to install an app on their phone and how she helped five or six perplexed individuals who attended the school IT preparation day to install the Zoom app.

During the lockdown period, WhatsApp groups were the main method of communication between teachers and learners (via parents). Teachers have posted work, either typed documents or handwritten and photographed images, on WhatsApp. These resources provided for ERE may not have been accessible to pupils with special educational needs or disabilities. None of the teachers spoke of this aspect in their interviews.

From the interviews, there were three different approaches adopted by the government schools to deliver lessons during ERE apart from materials sent via WhatsApp. These included both online and offline delivery depending on the availability of resources.

Offering Synchronous Lessons from School. Where there was equipment available at school, teachers were given access to timeslots where school computers could be used to conduct online synchronous lessons. Some schools combined multiple parallel classes and allowed more technology confident and interactive teachers to conduct online lessons while allowing less confident teachers to prepare assessments and conduct marking. This method allowed teachers to not worry about increased data charges or having access to computers at home. However, it also meant that they had to travel to work and the allocation of time slots meant there was no flexibility. National schools which had better facilities seemed to have followed this model of operation.

Offering Synchronous Lessons from Home. In some schools the teachers had to offer lessons from home where they had to have a computer and sort their own internet connectivity. While few teachers have protested of the increased burden on their budgets many have done this willingly.

With this model there was more flexibility to offer lessons at different times. In instances where there was more than one child and only one device, teachers have tried to accommodate this by varying their lesson times.

***Offering Workbooks*.** One school (the national school) had tried offering synchronous lessons but observed that not many pupils joined them. This school was situated in an area with tea plantations (estates) and the school was catering to some children from estate sector households. There is very low computer penetration in estate sector (6.4% in 2019) in Sri Lanka partly due to historical inequalities (indentured labour and colonialism). The school then created one workbook for each subject (textbooks are provided free of charge to all state school pupils) and placed copies of these in communication centres around the areas served by the school. Parents were messaged (WhatsApp and telephone calls) to inform them that the workbooks with assignments were available via the communication centres and they were asked to photocopy them from these centres. Dates and time slots were provided for the parents to submit the completed work back to school where they were marked and returned.

Offering workbooks is a way of bridging the digital divide; however, given that there are 5–8 books for each class (and two rounds of workbooks) it would have cost parents a considerable amount of money to get them photocopied. Given that the lockdown affected incomes, especially for daily-wage earners (as well as for many others), it could have been too difficult to afford at least for some. On the other hand, to make a photocopy a parent would have had to travel to a communication centre specified. During the lockdown this too could have been difficult for people who would have depended on public transport.

One teacher recorded the synchronous lessons while others did not. The teacher who recorded lessons had recorded them on to her laptop and then shared them using WhatsApp messages. But from the interviews it was ascertained that though the other teachers did not record lessons, recording lessons was done by some of their colleagues, at least sometimes. Therefore, it is likely that the practice of recording (or not) was up to the teacher offering lesson. If a student was unable to join the lesson, due to power failures or lack of data access for example, in some instances there was no option to catchup similar to missing a school lesson if they were not present in the classroom. Zoom allows local recording for desktop users whether they are on a paid subscription or on free version. However, mobile meeting recording facility is only available to paid users. Given that all teachers used the free Zoom app for synchronous lessons, it is likely that they would not have been able to record even if they wanted to if they were using a mobile device. On the other hand, they may not have had the knowledge that it was available to desktop users or have had concerns on privacy and data storage.

National Television Broadcast. One interviewee, an advanced level teacher, spoke of their experience of offering lessons on the national television. State-run TV channels, Channel Eye and Nethra TV, had broadcast educational content during the time of school closures. Furthermore, E-thaksalava, the national e-learning portal of the Ministry of Education, had also offered learning materials to pupils. National television lessons have mostly focused the pupils in exam grades. The interviewee shared a link to one of her lessons on YouTube. Therefore, these were available as recorded lessons for pupils to access later if they were unable to join the broadcast.

According to available data, 3.8 million households in Sri Lanka own a television yielding a 73% television penetration (Dataxis, 2013 Cited in Wijenayake & Samaraweera, 2016) as opposed to much lower computer and internet access rates. Therefore, using national television to broadcast lessons would have reached more pupils. According to ACTIONS framework (Bates, 2005), using television broadcast would have been a better media for ERE as the technology is widely accessible to pupils. However, with broadcast technology it is not possible to implement interaction, unless a phone-in service or email/letter service is used alongside. Even then, the interactivity achievable is likely to be

limited. At the time of writing (June 2021), there is a social media campaign to urge the Sri Lankan government to use television rather than online provision for ERE.

Issues Providing ERE

The teachers were facing various difficulties partly due to the imposed restrictions but in most instances, these were due to the online medium selected to provide lessons. The common themes identified during the interviews are categorised into five sections and described in more detail below.

1. Lack of Resources, Connectivity, and Infrastructure. A teacher who was meant to deliver lessons from home spoke of the dilemma she faced when both her children had to join school lessons and she had to conduct classes at the same time when they only had one laptop and one smartphone between them. After consulting with her class' WhatsApp group, she had offered lessons in the evening, which was well received by many who also have faced the same dilemma of not having enough devices for all their children. This is not an isolated incident as all around the world both in developing countries and developed countries many families have ended up in similar situations (BBC News, 2021; Tawil, 2020).

One teacher spoke of a pupil who lives in a rural village in Hambantota where there is not sufficient mobile signal coverage. She said that her student told her that he was joining the session from the top of a tree and that it is the only place where there is enough signal strength to join the class. Another teacher said that they saw news stories where children were climbing up trees and water tanks to join school lessons due to the poor reception in the area. While these may be amusing, it is a known fact that some areas in Sri Lanka lacks digital connectivity. In her thesis, Liyanagunawardena (2012, p.277) quotes a student from Hambantota, the same district as the child who reaches for mobile signal from a tree:

> "During the weekend whether I go home or not depends on the sort of work I have for the weekend. There [at home], I can't use even the [mobile] broadband connection. If there is anything I have to do in the weekend, I can't leave. I have to stay in this area [where mobile broadband service is available]."

Almost a decade on, the area and their residents are still facing the issue of access.

Another teacher spoke of the struggle she had to face to buy "data cards". As she did not have a dedicated data connection at home, she had to buy prepaid data cards. But due to the sudden demand during the lockdown, data cards were difficult to find. "…finding a data card was like finding gold!" she exclaimed. Once when she tried to buy two data cards (each worth Rs 50/=), the shopkeeper had only given her one data card stating that they only had two cards left in the shop and wanted two different households to benefit from them.

Later into the lockdown, some mobile broadband providers offered 50% discount to teachers for mobile connectivity infrastructure. However, not all offers were easy to understand. One teacher said it was tricky to understand the offer for teachers to use unlimited Zoom, Microsoft Teams and WhatsApp, saying that one had to have data left in their original package at the time they wish to use these applications (peak, off-peak) to make use of this "offer". For example, she said that her daughter's biology class (in a government school) was conducted 5am–6am because their teacher did not have peak-data left in their original package to use the "offer".

Two teachers spoke of their efforts to find donors and or sponsors for children who did not have devices. Another teacher spoke of a mother who pawned her jewellery to buy a smartphone for her children.

A teacher spoke of her son's school that sent lesson notes two days prior where it was expected the printouts would be ready for the lesson. However, she did not own a printer and relied on a work printer for printouts.

Microsoft (n.d.) states that the Ministry of Education selected Office 365 platform to be deployed island wide covering 3,000 schools and nearly three million users (10–19-year-old students and teachers). But in their presentation, they too have identified "lack of devices for both students & teachers" as a challenge. In summary, access to data and connectivity, access to devices and access to printing were common problems that teachers and their pupils have faced.

2. Lack of Digital Skills. All the teachers spoke of their colleagues, especially teachers who were close to retirement who have struggled due to the lack of digital skills. One teacher admitted that she would have struggled if not for her 13-year-old son who helped.

> "I know of a teacher, you know a dignified teacher, who got stuck in the middle of the lesson and had to ask her son who is a university student to come and help. To ask for help in front of the class to her was like losing her dignity".

Even after months of Zoom lessons, there were teachers who were still not able to schedule their own meetings. A teacher spoke of a colleague who asks help from their neighbour's teenage son over the fence to schedule her classes. Despite the lack of digital skills teachers have tried their best to get whatever support they could to conduct online lessons. On the other hand, all teachers felt that their pupils were much more at ease using technology. These observations raise the issue of usage access (Attewell, 2001; Warschauer, 2003; van Dijk, 2005). Even if someone has a physical device with connectivity, unless they are able to use it as properly, they are unable to gain the full use of digital technologies.

3. Distractions. Teachers also spoke of pupils turning off the camera during lessons; they suspected that the children were doing other things in class time. One teacher commented "When I asked to turn on the camera, the child said it was due to the data allowance. We can't insist on video being turned on".
Lessons were conducted as 60- or 90-mins sessions. However, as all the teachers were using the free version of Zoom, in the middle of the session the whole class had to re-join to continue the lesson. One Advanced Level teacher said that they moved to Google Meet as this software allowed them an uninterrupted class, which she felt was needed to keep pupil's concentration and not lose class time.

4. Student Wellbeing. One teacher who worked in a small school in a deprived neighbourhood of Colombo plagued by drug addiction spoke of her fears that at least some of her pupils could be exposed to drugs during the time they were out of school.

> "Their parents are drug addicts. We [the school] kept them safe [from drugs and their drug addict parents]".

Another teacher spoke of a family whom she feared for their wellbeing:

> "…the father is dead. Mother is about my age doing day jobs [cash in hand work]. One child in grade ten, the other in five. They don't have shoes to wear to school. I managed to find a donor to give them an old smartphone. But these families who earn a day-by-day living are badly affected".

5. Injustice. All teachers reported the number of children attending online lessons and or engaging with paper assignment submissions was less than satisfactory. One teacher who teaches in a deprived neighbourhood reported that despite having 60–65 children in the combined exam class, only about two or a maximum of three would join the online lessons. She also spoke of days where none turned up for lessons.

Another spoke of a child, looked after by their grandmother, who missed online lessons altogether due to not having access to a device. She also spoke of her efforts to find a donor and having to give up the effort as other teachers and parents warned her of the possible repercussions – giving an internet enabled device to a child without supervision and if something goes wrong being blamed for providing the device.

Teachers felt deeply conflicted about teaching to a class who were able to join online lessons when they knew some of their pupils did not have devices, connectivity and or support from their parents to join this alternative form of lessons. Many learners around the world who have not got access to digital technologies have been left behind as schools moved online. In their report to UNESCO, Tawil (2020, p. 6) questioned:

> "Technology-dependent distance learning strategies supported learning continuity for a few, but left a majority behind. Why then are governments around the world continuing to turn to it as a solution for preserving links to education?"

Comparison

The literature describing previous school closures (Johnson, 2014; Chen et al., 2011; Klaiman et al., 2011; Davies, 2010; Barrett et al., 2008) largely described situations where schools were shut for short periods with mitigations such as delaying examinations or where pupils were able to be placed in alternate schools. This was not the situation during Covid-19 as the closures were nationwide and prolonged with the need for ERE lasting for months. Bond (2020) has identified studies emerging of schooling and ERE during the Covid-19 pandemic, however she identified literature of stakeholders' experiences as largely missing and that no studies have covered Sri Lanka.

Demographics

Only 3.13% of Sri Lankan pupils attend private schools (Ministry of Education Sri Lanka, 2016) although in the survey sample it is 43%. Out of this group, only 10.8% reported that they shared devices and did not have enough time on them. However, this is contradictory to the general picture of Sri Lanka revealed by national statistics where only 22% of the population had access to computers (Department of Census and Statistics, 2019). Therefore, the online survey sample seemed to represent a more affluent group of the Sri Lankan society.

However, the interviews with a purposive sample of teachers from a variety of school settings provided insights of the wider community experiences. For example, refer to the example of the teacher's experience where in a combined exam class of 60-65, only two or three pupils joining online lessons. These experiences are in line with the literature on computer ownership of Sri Lanka (Department of Census and Statistics, 2019).

Resources

While Warschauer (2003) and van Dijk (2005) argued for the need to look beyond physical access in conceptualising digital inequality, in Sri Lanka there is a huge access divide and the UNESCO (2005) argument "digital divide is first and foremost a question of access to infrastructures" still holds. In the online survey only 10.8% of parents reported not having sufficient time on shared devices. However, in the teacher interviews there were many instances where the teachers reported their pupils (for example, few pupils of the combined exam class of 60-65 joining online lessons and a pupil reaching for signal from the top of a tree) and in some instances the teachers themselves were restricted due to physical access and connectivity. Refer to the instances where the teacher had to reschedule her lesson as she had to share devices with her children, the teacher who was unable to buy sufficient "data cards", and the biology teacher offering their lesson at 5am due to running out of data for daytime use. The lack of access to devices and connectivity on teachers' part affected large groups of children who may have had the resources to join online ERE. On the other hand, even when teachers

managed to provide ERE, due to the lack of devices and connectivity many children from government schools did not join the lessons (as discussed in the section on Injustice). In contrast, children who attended the private school were able to continue their education with minimal interruption as their resource rich school and affluent parents were able to adapt to the new medium of educational delivery with ease. Therefore, digital inequality seemed to exacerbate the already existing divides in society (Attewell, 2001; Warschauer, 2003; van Dijk, 2005; Liyanagunawardena, 2012).

When there was little or no participation from pupils, schools tried to offer alternative provision with workbooks. However, as parents needed to reach a communication centre selected by the school to photocopy the workbooks and pay for photocopying, these too added inconvenience, especially due to restricted public transport (due to imposed movement restrictions) and added financial pressure on the parents. The national television was also used for educational delivery targeting the exam year groups. Even if it were used for ERE, as the television penetration is 73% (Dataxis, 2013 Cited in Wijenayake & Samaraweera, 2016), still a sizable proportion of children would be left out of education but compared to 22% access to computers (Department of Census and Statistics, 2019) it would still be an improvement. This shows the complexity of providing ERE delivery in a medium reachable to all children as opposed to distance education, which is an informed choice made by the individual (Bozkurt et al., 2020; Hodges et al., 2020).

Skills and Readiness

The private schools were best placed for the move to online ERE, with existing experience of using a LMS and an IT department able to secure other software, set up accounts and offer basic training. Other schools relied on parents and teachers to set up contact lists (often in a piecemeal fashion). WhatsApp was widely used to communicate, creating many difficulties for parents for example, refer to the instances where parents were sent messages while at work and exceeding phone storage capacity with work assignments sent for multiple children. Where contact details were not known, or indeed non-existence, pupils were left behind. Many teachers found themselves relying on family and neighbours to set up software required to support ERE. Parents also reported frustrations with the software used. This again can be linked back to the literature that argue even when resources are there the ways in which they are used exacerbates the existing divides (Attewell, 2001; Warschauer, 2003; van Dijk, 2005).

When teachers encountered children without access to devices, they tried to find donated devices. However, refer to the instance where a teacher abandoned their quest to help a child looked after by the grandmother because the teacher did not want to be responsible for the unsupervised child with an internet enabled device. This again links back to the usage difference mentioned in Attewell (2001) where poor pupils use computers with minimal supervision while pupils from affluent families thrive with more adult involvement. It is also an example of how the most in need of support can be left behind with online ERE.

In general, the private school teacher observed many learners progressing well in the new online environment. This was confirmed by the mock exam results, which exceeded the expectations. The learners in this group had the resources and were prepared for online educational delivery. In contrast, government schoolteachers observed children without access and even with access some children were distracted. Parents too reported their children getting distracted during online lessons. Additionally, because the government schools used the free version of Zoom software, after 40mins the whole class had to re-join the session to continue the lesson; whereas the private school using a paid-for software (Microsoft Teams) was able to avoid such distractions. When the teachers were digitally literate to seek alternatives (and were allowed), they tried to find different software that did not limit the lesson time so that their classes would not be disrupted unnecessarily demonstrating the ability “to use ICT for personally or socially meaningful” way (Warschauer, 2003, p.32).

Limitations and Future Work

The study adopted a self-administered online survey as one of the data collection methods. Therefore, it inherits both advantages and disadvantages associated with self-administered questionnaires. In a pandemic where social distancing is enshrined in law and it was not possible to contact people in traditional ways, for example, distributing printed surveys, using online methods for data collection was highly desirable. However, given the low internet penetration in Sri Lanka, an online survey is unlikely to be representative of the general population of the country. Nevertheless, the data collected represents the view of a segment of the Sri Lankan population. The survey was presented in both English and Sinhala making it more accessible for Sri Lankans. Had the survey also been translated to Tamil it would have been more accessible.

To mitigate the issue of eliminating the views of those who do not have ready access to internet and social media, a purposive sample of teachers from various parts of the country were interviewed to bring their experience of working with a range of learners into the study. The authors believe this to be one of the first works exploring ERE experiences in Sri Lanka adding value to this work. There is potential for a future study to be framed to reach those who were without internet access during the ERE period, in Sri Lanka and beyond, to analyse their experiences and provide recommendations in preparation for future emergency responses across population. It would be worth investigating how different countries have provided ERE and learning lessons and best practices from their experiences that can be replicated elsewhere.

Conclusion and Suggestions

This research employed mixed methods (an online survey to gather homeschooling experiences of parents and interviews with a purposive sample of teachers) to understand emergency remote education efforts in Sri Lanka during the Covid-19 lockdown. Despite the difficulties faced, teachers have tried their best to offer some form of ERE to their pupils. Synchronous lesson offering depended largely on the resources available to the school, teachers, and the uptake. Some schools also offered print materials to their pupils. National television broadcasts were also used in ERE. Parents in the Western province were comparatively more satisfied with the ERE than their counter parts in other areas of the country. Where there were sufficient resources and digital skills the online ERE provision has been a success. The lack of devices, connectivity, insufficient data plans and infrastructure together with the lack of digital skills on teachers' part were all issues relating to the multifaceted nature of the digital divide that shone through this study. The study also highlighted the plight of rural villagers not having access to the internet due to infrastructure failures. The research showed that while online offering of ERE may seem viable or desirable in certain areas or circumstances, there are large parts of Sri Lanka that are not set up for this form of educational delivery, which should be considered in any future implementations of ERE.

References

Asian Development Bank. (2011). *Completion Report – Sri Lanka: Distance Education Modernization Project*. Asian Development Bank. https://www.adb.org/sites/default/files/project-document/60150/33251-013-sri-pcr.pdf

Attewell, J. (2001). The first and second level digital divides. *Sociology of Education, 74*(3), 252-259.

Bates, A. W. (2005). *Technology, E-Learning and Distance Education* (2nd ed.). Routledge.

Barbour, M. K., & Reeves, T. C. (2009). The reality of virtual schools: A review of the literature. *Computers & Education*, *52*(2), 402-416. https://doi.org/10.1016/j.compedu.2008.09.009

Barrett, E. J., Ausbrooks, C. Y. B., & Martinez-Cosio, M. (2008). The school as a source of support for Katrina-evacuated youth. *Children Youth and Environments*, *18*(1), 202-235.

BBC News. (2021, January 7). *Covid-19: Parents struggle to meet home schooling demands*. https://www.bbc.co.uk/news/uk-england-somerset-55566049

Beck, U. (1992). *Risk Society: Towards a New Modernity*. SAGE Publications Ltd.

Bond, M. (2020). Schools and emergency remote education during the COVID-19 pandemic: A living rapid systematic review. *Asian Journal of Distance Education*, *15*(2), 191-247. http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/517

Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., Lambert, S. R., Al-Freih, M., Pete, J., Olcott, D., Rodes, V., Aranciaga, I., Bali, M., Alvarez, A.V., Roberts, J., Pazurek, A., Raffaghelli, J. E., Panagiotou, N., de Coëtlogon, P., …, Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 Pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, *15*(1), 1-126. https://doi.org/10.5281/zenodo.3878572

Central Bank of Sri Lanka (2020a). *Sri Lanka: Socio Economic Data 2020.* Central Bank of Sri Lanka. https://www.cbsl.gov.lk/sites/default/files/cbslweb_documents/publications/otherpub/publication_sri_lanka_socio_economic_data_folder_2020_e.pdf

Central Bank of Sri Lanka (2020b). *Economic and Social Statistics of Sri Lanka 2020*. Central Bank of Sri Lanka: Colombo. https://www.cbsl.gov.lk/sites/default/files/cbslweb_documents/statistics/otherpub/ess_2020_e1.pdf

Chen, W. C., Huang, A. S., Chuang, J. H., Chiu, C. C., & Kuo, H. S. (2011). Social and economic impact of school closure resulting from pandemic influenza A/H1N1. *Journal of Infection*, *62*(3), 200-203.

Creswell, J. W. (2003). *Research Design Qualitative, Quantitative and Mixed Methods Approaches*. (2nd ed.). Sage.

Davies, L. (2010). Understanding education's role in fragility: Synthesis report on Afghanistan, Bosnia-Herzegovina, Cambodia and Liberia (Report for INEE). International Institute for Educational Planning (IIEP), Paris.

Department of Census and Statistics. (2016). *Household Income and Expenditure Survey – 2016*. http://www.statistics.gov.lk/Resource/en/IncomeAndExpenditure/HouseholdIncomeandExpenditureSurvey2016FinalResults.pdf

Department of Census and Statistics. (2019). *Computer Literacy Statistics – 2019 (Annual).* http://www.statistics.gov.lk/Resource/en/ComputerLiteracy/Bulletins/AnnualBuletinComputerLiteracy-2019

Erandi, K.K.W.H., Mahasinghe, A.C., Perera, S.S.N., & Jayasinghe, S. (2020). Effectiveness of the Strategies Implemented in Sri Lanka for Controlling the COVID-19 Outbreak. *Journal of Applied Mathematics, 2020*. https://doi.org/10.1155/2020/2954519

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, March 27). The difference between emergency remote teaching and online learning. *Educause review*.

https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Internet World Stats (2020). *World Internet Users and 2020 Population Stats.* https://www.internetworldstats.com/stats2.htm

Johnson, V. A., & Ronan, K. R. (2014). Classroom responses of New Zealand school teachers following the 2011 Christchurch earthquake. *Natural Hazards*, *72*(2), 1075-1092. https://doi.org/10.1007/s11069-014-1053-3

Klaiman, T., Kraemer, J. D., & Stoto, M. A. (2011). Variability in school closure decisions in response to 2009 H1N1: a qualitative systems improvement analysis. *BMC Public Health*, *11*(1), 1-10. https://doi.org/10.1186/1471-2458-11-73

Liyanagunawardena, T. R. (2012). *Information Communication Technologies and Distance Education in Sri Lanka: A case study of two universities*. [Unpublished doctoral dissertation]. University of Reading.

Liyanagunawardena, T. (2020, September 29). eLearning in Challenging Times: Homeschooling UK. *UCEM Online Education Blog*. https://blog.ucem.ac.uk/onlineeducation/posts/1744

Liyanagunawardena, T. R., Adams, A. A., Rassool, N. & Williams, S. A. (2013). Using non-personal computers for eLearning: Sri Lankan experience. *Journal of Education and Training Studies*, *1* (2), 152-158. https://doi.org/10.11114/jets.v1i2.96

Liyanagunawardena, T. R., Adams, A. A., Rassool, N. and Williams, S. (2014). Developing government policies for distance education: Lessons learnt from two Sri Lankan case studies. *International Review of Education*, *60*, 821-839. https://doi.org/10.1007/s11159-014-9442-0

Liyanagunawardena, T. R., & Williams, S. A. (2021). Emergency Remote Learning in the UK – a comparison of March 2020 and January 2021, British Educational Research Association Blog (forthcoming).

McLuhan, M. (2001). *The Medium is the Message: An Inventory of Effects*. Gingko Press.

Microsoft. (n.d.). *Public Private Partnership with the Ministry of Education in Sri Lanka*. https://www.unicef.org/rosa/media/8536/file

Ministry of Education Sri Lanka. (2016). *School Census Preliminary Reports 2016*. http://statistics.gov.lk/Resource/en/Education/School_Census/2016.pdf

ONS (2020, July 22). Coronavirus and homeschooling in Great Britain: April to June 2020. https://www.ons.gov.uk/peoplepopulationandcommunity/educationandchildcare/articles/coronavirusandhomeschoolingingreatbritain/apriltojune2020

Onyema, E. M., Eucheria, N. C., Obafemi, F. A., Sen, S., Atonye, F. G., Sharma, A., & Alsayed, A. O. (2020). Impact of Coronavirus Pandemic on Education. *Journal of Education and Practice*, *11*(13), 108-121.

Smith, F., Jolley, E., & Schmidt, E. (2012). Disability and disasters: The importance of an inclusive approach to vulnerability and social capital. Haywards Heath, UK: Sightsavers. https://www.sistemaprotezionecivile.it/allegati/1476_Disability_and_disasters.pdf

Stacey, E., & Visser, L. (2005). The history of distance education in Australia. *Quarterly Review of Distance Education*, *6*(3), 253.

Tawil, S. (2020). Six months into a crisis: Reflections on international efforts to harness technology to maintain the continuity of learning. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000374561/PDF/374561eng.pdf.multi

UNESCO. (2005). *Towards Knowledge Societies*. UNESCO World Report. UNESCO Publishing.

van Dijk, J. (2005). *The Deepening Divide: Inequalities in the Information Society*. Sage.

Warschauer, M. (2003). *Technology and Social Inclusion: Rethinking the Digital Divide*. MIT Press.

Wijenayake, K.V.A.H.P., & Samaraweera, S. (2016). Determinants of Programme Preferences and Watching Hours of Television: With Special Reference to Gampaha District. *University of Sri Jayewardenepura, Sri Lanka, 13th International Conference on Business Management (ICBM).* 347-366. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2910307

Yin, R. K. (2003). *Case Study Research Design and Methods*. (3rd ed.). Sage.

Acknowledgement

The authors would like to thank Dr Adrian Shell for his comments on an earlier draft and proofreading the article and the anonymous referees for their constructive comments.

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Suggested citation:
Liyanagunawardena, T. R. & Williams, S. A. (2021). Emergency remote education: Experience from Sri Lanka during Covid-19. *Asian Journal of Distance Education, 16*(1), 207-229. https://doi.org/10.5281/zenodo.4988349

Appendix

1. Which country do you live in? Sri Lanka, Other
2. How many adults (over 18s) live in your household? 1, 2, 3, 4, 5, 6, Other
3. Do any of the adults in your home require extensive care (due to long-term illness, frailty or old age, or other)? Yes No
4. How many of the adults in your home are in full-time (30 or more hours a week) paid work (including self-employment)? 0, 1, 2, 3, 4, 5, 6, Other
5. How many of the adults in your home are in part-time (less than 30 hours a week) paid work (including self-employment)? 0, 1, 2, 3, 4, 5, 6, Other
6. Of those in work, during the Corona virus (COVID-19) lockdown, how many adults were able to work from home? 0, 1, 2, 3, 4, 5, 6, Other
7. Of those in work, during the Corona virus (COVID-19) lockdown, how many adults had to report to work (not working from home)? 0, 1, 2, 3, 4, 5, 6, Other
   b) During Covid-19 lockdown, of those who had to report to work (not working from home), how often did they have to report to work? (select all that applies)
   Every day, Most days (three or more days a week), Occasionally (one or two days a week), Rarely (less than once a week), Other
8. Are there any adults in your household who are educators (preschool, school or college teachers, lecturers, teaching assistance; or any other profession involved in teaching and learning)?
   Yes, No
9. How many school aged children live in your household? 0, 1, 2, 3, 4, 5, 6, Other

   b) Please list the school and the year of study for each child in the space provided (these are only used for categorisations and data will be anonymised).
10. How many children younger than school age live in your household? 0, 1, 2, 3, 4, 5, 6, Other
11. Do any of the children in your household have special educational needs or disabilities? Yes No
12. Where is your home located? (select the district) Ampara Anuradhapura, Badulla, Batticaloa, Colombo, Galle, Gampaha, Hambantota, Jaffna, Kalutara, Kandy, Kegalle, Kilinochchi, Kurunegala, Mannar, Matale, Matara, Monaragala, Mullaitivu, Nuwara Eliya, Polonnaruwa, Puttalam, Ratnapura, Trincomalee, Vauniya

    b) Do you consider that you live in a rural area?
    Yes, No
13. Do you consider your home to have adequate space for the adults to do their work and children to do their school work? (separate table, chair, quiet space) Yes No
14. Do you have a dedicated device (such as a computer, laptop, tablet) for each adult and each of the school aged children in your home or do you share devices? (select the answer which describes your situation best).

We have more devices than people in the house, We have enough devices for all of us to use, We share devices and have enough time on them for everyone, We share devices and we don't have enough time on them for everyone, We do not have any devices, Other

15. Do you have internet connectivity at your home? Yes No

b) If so, what is the type of connectivity you have? Optical fibre connection, ADSL connection, Mobile internet connection, Dialup connection, Other

c) If you have internet connectivity at home, do you have unlimited access to the internet or do you have a limited data allowance? Unlimited access, Limited data allowance

   i) Is your data allowance sufficient for your household needs? Yes No
   ii) Is the internet bandwidth (speed) sufficient for your needs? Yes No

d) Are there any other issues with your internet connectivity?

16. Do you have a printer at home? Yes No
    Please give more details if you have used this for children's schoolwork?
17. Which statement fits best about your use of technology? I am a confident user of technology, I think I am okay with technology, I am struggling with technology
18. What educational work was done away from the school and who was involved before Covid-19 lockdown? For example: Young children may have had reading to do at home and this may routinely involve parent and child for 30 minutes a day. Older children may be given homework for each subject several times a week. This may take 3 hours per week but not involve parents other than ensuring that there is time and space. If you have more than one child, use the space provided to give your varied experience.

19. What is the highest educational qualification of the adult who supported the children most in their schooling during lockdown? No formal educational qualifications, GCE O/L, GCE A/L, Undergraduate degree, Postgraduate degree, Other
20. During the lockdown my child's school provided sufficient learning materials? Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree
    a) How were these materials provided? (Please select all that apply) Printed packs of materials, Online materials where work was done online, Online materials that had to be printed and worked on, Online video lessons, Online tests, Using social networks, Discussion Forums, Other b) Did you face any difficulties using the provided learning materials to homeschool your child during the lockdown. Please describe your experience.

21. During the lockdown, how much time (on average per a school day) did your eldest child spend on schoolwork? More time than they would have spent at school, About the same time as they would have spent in school, Less than the time they would have in school, Hardly any time at all
22. During lockdown learning what were the opportunities to interact with the teacher and others of the class for your eldest child?
23. During the lockdown homeschooling, how long on average did all the adults who helped with child(ren)'s homeschooling spend supporting child(ren) on a school day? (Please include the time you have spent with all your children in hours) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, More than 10 hours
24. During the lockdown, did you provide your children with additional resources that were not given by school (for example videos found on You Tube, extra workbooks, or worksheets, questions prepared by family members)? Yes No
25. What do you think your child(ren)'s progress in learning during the lockdown? Good progress, Similar to where they were when schools closed, Gone backwards
26. How do you feel about the homeschooling of your child(ren) and their education during the lockdown? I am satisfied with the education they received, I am indifferent about the education they received, I am not satisfied with the education they received
27. Were there any extra support that you received for homeschooling? For example, reduced data charges, increased data allowances etc.
28. Do you think there were ways you could have been supported more? Please provide as much detail as possible.
29. What did your child(ren) miss most during the lockdown? If you have more than one child, please use the space to give us information.
30. I am Male Female Prefer not to say
31. How old are you?
32. Is there anything else about the Covid time school closure and homeschooling that you want to tell us about?