The status and challenges of the E-Learning in the plantation sector:
A Study based on the Covid-19 epidemic in Sri Lanka

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Abstract

ICT are highly dominating all aspects of Education sector in the world during the Covid-19 pandemic which is not an exception for Sri Lanka. Plantations are one of the most backward communities in Sri Lanka. In this backdrop, this study is "Identify the status and challenges of the E-learning system in the Plantation Sector during the Covid-19 epidemic". This study adopts mixed approaches and collected primary data using online questionnaire (google form) survey and zoom interviews with students. Secondary data was collected from several resources. The convenience sampling method used to select the 250 Students in plantation and the data were analyzed through SPSS version-25. E-learning System, 90.2% of them are using smartphones, 13% of them are using laptops, and 5.2% of them do not have any device to participate in e-learning and 91.1% utilize the Zoom app, 16.2% use Google Meet use for it. The average computer literacy rate is 11.12% and digital literacy is 19.64% for the last five years in the plantation. Grade 5 students are learning 10.48 hours, and undergraduates are learning 14.67 hours per week. Educational levels have a substantial impact on the cost of online learning. Grade 5 students are very lowly satisfied (mean value=2.65 and SD=0.885) with e-learning, whereas postgraduate students are highly satisfied (mean=3.86, SD=0.378) with the online system. Educational levels are significantly correlated (0.205(P>0.05)) with knowledge improvements through online learning. Primarily, students like e-learning due to Covid-19 (66.4%), while they dislike its lack of network coverage (53.2%). 64.1% of those affected by eyes that begin to burn and itch and 54.7% of those with headaches. The setbacks in social and economic factors and the lack of ICT infrastructure are affecting the e-learning system in the plantations. Therefore, effective policy and institutional measures are vitally important to address these shortcomings and move towards the sustainable development of the e-learning system in plantations as well as Sri Lanka.

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1. Introduction

The use of electronic media, educational technology, and information and communication technologies (ICT) in education is known as e-learning. The influence of ICT in the educational sector is particularly noteworthy, and it should be mentioned that significant advancements have been achieved in instructional and interactive technology, with tertiary education institutions continuously striving to provide a high-quality education to the student population. Technology is currently seen as a form of capital investment. The Covid-19 epidemic has had a significant impact on student education at all levels, resulting in near-total educational institution closures. In an attempt to halt the spread of the Covid-19 epidemic, most governments across the world have temporarily shuttered educational institutions. Not only do education cuts affect students, teachers, and households, but they also have significant social and economic consequences for everyone in Sri Lanka. In Sri Lanka, according to the 2020 Computer Literacy Report, 32.3 percent have computer literacy and 50.1 percent have digital literacy. Computer-owning households account for 22.2 percent of all households, with urban households accounting for 37.1 percent, rural households for 20.1 percent, and estates accounting for 3.8 percent. The percentage of people who use the Internet and e-mail is 36 percent and 14 percent, respectively. In comparison to other sectors, the aforementioned factors are extremely low in plantation (Computer literacy statistics 2020, Department of Census and Statistics, Sri Lanka). The central bank report (2020) of Sri Lanka mentioned that the number of cellular phones is 143 out of 100 people, and internet penetration is 79.9% in 2020.

The vast majority of the Sri Lanka plantation workers belong to a Tamil-speaking community, officially known as 'Indian Tamils' or 'Hill country Tamils' whose origin dates back to the british colonial period in the early 19th century. Despite some improvements in their socio-economic situation, they are one of the most backward communities considering their education level and geographical, social, cultural, and administrative isolation from the country's mainstream. In addition to negative stereotypes and resultant discrimination, which is both a structural and everyday experience, they lag far behind the rest of the population in all areas of life (World Bank, 2017). The plantation sector is one of the significant economic avenues of the country in the last two centuries. However, plantation community people (Estate) are living backwards for several socio-economic reasons compared with other parts of society. Mainly, the study generation is affected by the above reasons. At the same time, Covid-19 affected their educational activities in several ways after December of 2019. This study tries to capture the status and challenges of the E-Learning System in the Plantation Sector.

1.2 Research Problem

In Sri Lanka, the Covid-19 is one of the primary reasons for the transformation of the traditional education system to e-learning. Due to a lack of ICT infrastructure and telecommunication connectivity, social and economic issues constitute a major impediment to e-learning throughout the entire island. At the same time, as compared to the rural and urban sectors, the Plantations lag far behind. Because, during the Covid-19 Pandemic, students at Plantations' schools experience several problems in the online learning system. Specifically, they lack the necessary devices, technological expertise, and resources to follow the course online.

Main objective is "To identify the status and challenges of the E-Learning in the Plantation Sector during the Covid-19 pandemic". Sub objectives are to identify the status of ICT and telecommunication infrastructure in the plantation sector, to identify the current stage and effect of the e-learning system in the plantation sector, to identify the challenges and students' perspectives on the e-learning system in plantation and to discuss the socio-psychological challenges of plantation students in online education during the Covid-19 pandemic. Additionally, improved ideas and solutions for the development of ICT infrastructure and other significant changes to the e-learning system in the plantation sector with the objective of enhancing educational success among estate students.

2. Literature Review

The following paragraphs address previous online learning research conducted during the Covid-19 crisis, as well as some research on online learning problems and educational technology in general. The world health organization has declared Covid-19 as a pandemic that has posed a contemporary threat to humanity. This pandemic has successfully forced global shutdown of several activities, including educational activities. As a result education has changed dramatically, with the distinctive rise of online learning, whereby teaching is undertaken remotely and on digital platforms. Efforts to contain Covid-19 have included the closure of schools globally. So far 1.2 billion children in 186 countries have been affected (Liu et al; 2020). Although the Covid-19 pandemic has severely impacted the education ecosystem in Sri Lanka over the last year (Sliva.D; 2020). According to H.D.C. Priyadarshani and D. Jesuiya, in order to be successful in a country like Sri Lanka, some considerations must be made. This entails infrastructural upgrades, improved Internet connectivity, rural expansion, and a shift in teaching attitudes, among other things. For the utilization of online classrooms, schools and other educational institutions must provide excellent teaching and supervision from both students and professors (.D.C. Priyadarshani and D. Jesuiya; 2021).

The popularity of online classes has led to an increase in the number of institutions and universities providing online courses in recent years (Beatty and Ulasewicz, 2006; Li and Akins, 2005). Furthermore, technology innovation and student demand for online classrooms (Bennett and Lockyer, 2004; Britt, 2006) have pushed schools and universities to offer online classes alongside traditional programs. The key point here is that online courses are not mandated by schools to be used, but they are considered as a modern approach for dealing with difficulties throughout the learning process (Agustina and Cahyono, 2017). Numerous institutions plan to spend money on internet-based classrooms, as well as on hiring and training professors to teach online (Floyd, 2003; Koehler et al., 2004). The worldwide education landscape has been abruptly changed in favor of online learning as a result of the temporary shutdown of educational institutions during the coronavirus disease (Covid-19) epidemic (United Nations. 2020). As of June 1, 2020, 90.3 percent of Japan's institutions provided distance education during Covid-19 (Ministry of Education,Tokyo, 2020). 88% of teenagers in upper-middle-income countries completed their education, with 54% using video lectures and 40% using online assessment (International Labour Organization, 2020). The Information and Communication Technology Agency of Sri Lanka (ICTA) has launched many ICT initiatives under the eSri Lanka umbrella. The eSri Lanka initiative's major goals are to "grow Sri Lanka's

economy, alleviate poverty, and improve the quality of life." 2011 (E-Sri Lanka). The Lanka Education and Research Network (LEARN) was used for online education and was connected to university web servers. During the coronavirus disease (Covid-19) pandemic, all internet service providers in Sri Lanka gave free access to university servers. This has aided in the promotion of online learning for Sri Lankan students (Asian Development Bank; LEARN. 2020).

3. Research Methodology

This study adopts a mixed research approach (qualitative and quantitative). For analysis, this study collected primary data using a mixed-method approach through an online (google form) questionnaire survey and zoom application based interviews with students who are studying from schools to higher education in the plantation community. Several estates in multiple districts and various cultivations such as tea, rubber, palm oil, and others are covered during the data collection process with the help of several people. The secondary data was collected from several resources, including books, magazines, reports, and articles. Mainly from secondary sources of information derived from the department of census and Statistics reports on computer literacy from 2006/07 to 2020 and various other secondary sources. The 250 students in the plantation were chosen using the convenience sampling method, and the data were analyzed using SPSS version 25.For this study, central tendency measures and the descriptive analysis approach are used for analysis, and tables and figures are used to discuss the results of this study as well. Finally, this study recommended several matters for the improvement of the e-learning system in the Plantation Community.

4. Finding and Discussion

4. 1 The Status of ICT Infrastructure and Telecommunication access in Sri Lanka

In Sri Lanka, the national average number of computer users is 29 out of 100 people, and 42 people have digital literacy out of 100 between the periods of 2015 -2020. The distinction between digital and computer literacy is related to smartphone usage in Sri Lanka. It is a little bit higher compared with desktop and laptop usage. On average, one household has a desktop or laptop out of five households in Sri Lanka. Annually, 26 and 12 percent of people use the Internet and email at least once a year, respectively. In recent years, 30.82% of desktops and laptops (SD=10.7265) and 64.18% of smartphones (SD=12.7606) have been used to connect to Internet/Email services. According to the sector view, urban sectors are highly developed by digitalization compared with other sectors. Figure 1 clearly described the growth rate of Computer owned household by sector the period of 2004 - 2020.

Figure 1: Percentage of Computer owned Household by Sector
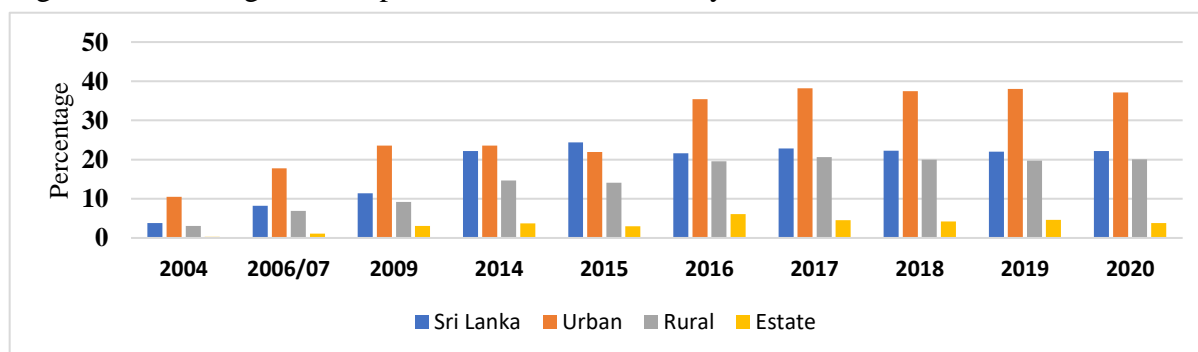
4.2 The Status of ICT Infrastructure and Telecommunication access in the Plantations

According to this study, the computer literacy rate in Sri Lanka is at a low level at only 32.3%, and the number of computer-owning households was 22.22%, while the digital literacy rate accounts for 50.1% of the 2020 data published by the Census and Statistics Department of Sri Lanka. In plantation, the following trends are identified through the analysis of data, which includes the last five years (2015-2020). Table 01 described the status of important indicators.

Table 1: The Status of ICT indicators of Plantation in 2015-2020

Indicator (2015-2020)	Average	Standard Deviation (SD)
Computer Literacy	11.12 %	1.5320
Digital Literacy	19.64 %	5.0525
Internet Usage	8.90 %	4.2332
Email Usage	2.54 %	0.3209
Number of Computer Own Households in Estate	4.64 %	0.8735

The average computer literacy rate is 11.12% and the standard deviation is 1.5320. The average digital literacy is 19.64% and the SD =5.0525 for the last five years. It clearly indicates the low growth rate and lack of improvement in the digitalization of the estate. Furthermore, Internet usage (Average=8.90%, SD=4.2332) and email usage (Average=2.54%, SD=0.3209), as well as the number of computer-owned households (Average=4.64%, SD=0.8735), are found to be very low in the estate sector, as is the growth rate.01 clearly indicates the current status of digitalization. That's referred to the inadequate technologies, infrastructure, and low level of education, poverty, and high price of technology devices, as well as lack of development in the plantation sector. Those are highly affected on the development of the ICT sector. Even so, the value of the national percentages are very low compared with other countries.

4.3 The Status of e-learning system in the plantation sector during the Covid-19 epidemic

According to the online survey, 42.4 percent of the students in the sample are male and 57.6 percent are female.16.8% of them live in the estate, which is very close to the urban area, 18.4% live near the semi-urban area, and 64.8% live far away from the town. Among the students, 35.2% of Nuwarelia, 21.6% of Badulla, 13.6% of Kandy, 11.6% of Ratnapura, 2.8% of Monaragala, 6% of Matale, 6% of Kegalla, and 3.2% of other districts which are related to the plantation sector. The following table 02 describes the students' distribution of the sample.

Table 2: Sample profile by Educational Levels

Educational Level	Frequency	Percentage	Cumulative Percent
Primary Education	23	9.2%	9.2%
Secondary Education	14	5.6%	14.8%
O/L	36	14.4%	29.2%
A/L	94	37.6%	66.8%
Undergraduate	55	22.0%	88.8%
Graduate	16	6.4%	95.2%
Postgraduate	7	2.8%	98.0%
other	5	2.0%	100%

School education represents 66.8% of them, while higher educational institutions (33.2%) constitute the remaining 33.2 percent. Parents of students work in a variety of fields: 33.6 percent are estate workers, 21.3 percent are daily employees, 13.3 percent are unemployed, 8.6 percent are vegetable farmers, 7.8 percent are small business owners, and 6.1 percent are drivers, others are working several fields.

The family's average monthly income is 39,309.52 rupees in the estate nearest to the urban area, 30,826.09 rupees in semi-urban estates, and 22,882.72 rupees in the estate farthest from the towns. Because they are solely reliant on the estates' daily work pattern and the extremely low compensation for day labor. Others are working on something else. However, it had an impact on the Covid-19. Overall, estate employees' wages are relatively low in comparison to other industries, and this is one of the primary reasons of poverty on the plantation. At the same time, poverty has a significant impact on education, including the plantation sector's online education system. In the estate family, an average of 2.30 persons study on the plantation. The standard deviation value is 1.165 and the variance is 1.358. This is brought up because every household in the estate has at least one student. The average number of devices in each family in the estate is 1.78, and SD=1.145. Then we can easily identify the lack of devices for the E-learning system in the estate. Because the average number of students is high compared with the availability of devices (2.30 > 1.78). For the E-learning System, 90.2% of them are using smartphones, 13% of them are using laptops, and 5.2% of them do not have any device to participate in e-learning. It means that out of the 20 students in the estate, more than one does not have a device for e-learning. The devices which are used for e-learning are listed in the table 3.

Table 3: Types of devices used for the e-learning

Devices	Frequency	Percent	Cumulative Percent
Smartphone	196	78.4%	78.4%
Laptop	28	11.2%	89.6
Tab	5	2.0%	91.6
Desktop Computer	8	3.2%	94.8
No any device to e-learning	13	5.2%	100

Samsung is utilized by 52.7 percent of smart phone users, followed by Huawei (16.3%), Vivo (8.9%), Oppo (8.5%), Redme (4.2%), Nokia (4.3%), and Realme (2.7%), with other mobiles accounting for 2.4 percent. HP is used by 12%, DELL by 8.4%, and other laptops are used by 9.6%, including ACCER, LENOVA, and ASUS. They don't have laptops or desktop computers in 85.6 percent of cases. Out of the 20 students on the estate, only three have laptops or desktop computers, according to the survey. 75.2% of them are using mobile data for the internet service, 16.8% are using Dialog Broadband, and 5.6% are using SLT Broadband Services for the Internet facilities. Among the mobile data users, Dialog had 68.8%, Airtel 17%, Mobitel 24.3%, and Hutch 6.5%. The percentages of e-learning purposes are as follows. External certificate courses, 4.5 % external diploma courses, 2.8 percent external degrees, 4.9 percent postgraduate studies, and 9.2 % competitive examinations account for 61.4 % of school education, 24.8 % of university education, 6.1 % of external certificate courses, 4.5 percent of external diploma courses, 2.8 percent of external degrees, 4.9 % of postgraduate studies, and

9.2 % of competitive examinations. 91.1 % utilize the Zoom app, 16.2 % use Google Meet, and 20.6 % use WhatsApp Class Room for this.

Figure 2 : Social media used by students during the Covid-19 pandemic.
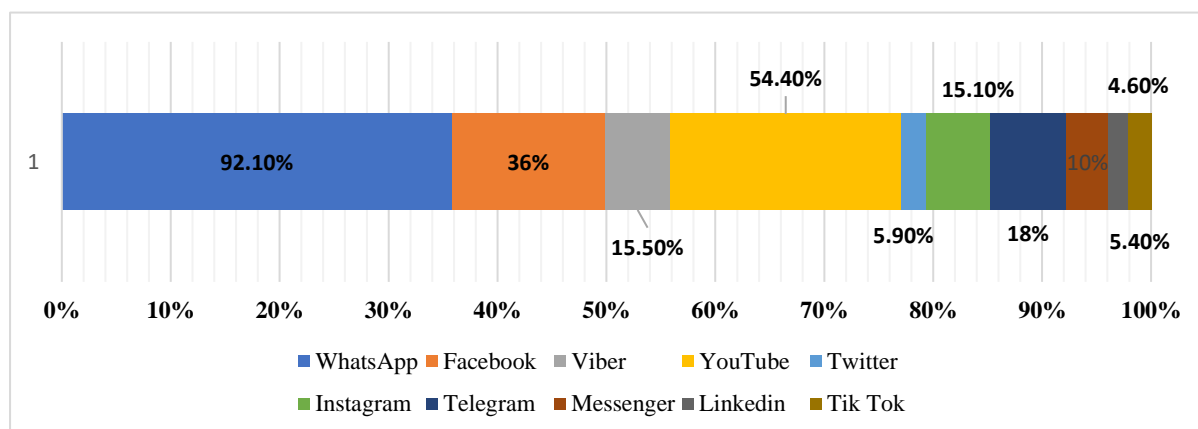
The above Figure 2 describes the percentage of plantation students using social media during COVID 19. Among them, the following social media are used to share the study materials online. Such as 93.5% of WhatsApp, 11.4% of Facebook, 11% of Viber, 10.6% of Telegram, 1.6% of Messenger and Email 26.8%. School students are heavily using WhatsApp for exchanging study materials, whereas very, very rarely using emails for that. But higher education students use it as one of the media for exchanging study materials online. During the online education, 79.1% of them have followed the classes, 55.3% of them have done online exams, and 25.8% of them have written paper-based exams but discussed online. 30.7% of them are used for discussions, 30.3% for group activities, and 29.9% for assignments. Table 04 described the e-learning hours and Cost for the internet service.

Table 4: e-learning hours and Cost for the internet service

Educational Level	E-Learning hours Per week		Cost for the Internet per Month	
	Mean	SD	Mean	SD
Primary Education	10.48	8.903	410.87	310.77
Secondary Education	6.93	6.120	566.21	647.65
O/L	7.44	7.319	573.36	423.36
A/L	8.84	8.854	901.71	871.21
Undergraduate	14.67	9.220	1016.49	998.77
Graduate	9.94	6.351	930.81	509.63
Postgraduate	11.86	4.298	1395.00	1118.41
other	14.20	10.686	1250.00	942.07
Overall	**10.23**	**8.726**	**842.38**	**819.72**

During the Covid-19, students in Grade 5 (Scholarship) are the most likely to use online learning. They spend an average of 10.48 hours per week learning, with a standard deviation of 8.903. Undergraduates in higher education spend an average of 14.67 hours a week online learning, with a standard deviation of 9.220. Students in postgraduate and college education programs also devote 14.20 hours a week to learning. At 10.686, the standard deviation is likewise rather high. Strikes by teachers' unions now have an influence on school pupils' online learning. Because the majority of teachers are discontinuing online classes. In terms of cost,

primary school pupils use an online learning package, whereas postgraduate students spend so much money on internet access for online learning. We can see that educational levels have a substantial impact on the cost of online learning. When the educational level is raised, the cost of online learning rises dramatically. Graduates, on the other hand, are part of a timely online involvement for competitive examinations and other courses (9.94 hours and SD=6.351). Overall, students in the plantation spend an average of 10.23 hours per week learning online and spend an average of 842.32 rupees per month.

Table 5: Students' satisfaction with the e-learning system and the scale of improvement

Educational Level	Satisfaction of E-Learning		Helps to Improve the knowledge	
	Mean	SD	Mean	SD
Primary Education	2.65	0.885	2.39	0.839
Secondary Education	2.93	1.141	2.57	1.284
O/L	3.50	1.183	3.19	1.369
A/L	3.21	1.046	3.15	1.067
Undergraduate	3.04	1.018	3.00	1.018
Graduate	3.44	0.727	3.50	0.966
Postgraduate	3.86	0.378	3.43	0.535
other	3.00	0.708	3.20	0.548
Overall	**3.18**	**1.038**	**3.06**	**1.101**

Table 5 referred that Students' satisfaction with the e-learning system and the scale of knowledge improvement. Grade 5 students are very lowly satisfied (mean value=2.65 and SD=0.885) with e-learning, whereas postgraduate students are highly satisfied (mean value=3.86 and SD=0.378) with the online system. Secondary students are also dissatisfied with the online experience. But O/L and A/L students are satisfied compared with school students. Higher education students are more satisfied with online learning. The improvements in knowledge are accepted at a very low level by the primary and secondary students (mean values=2.39 and 2.57) while O/L and A/L students are neutrally (mean values=3.19 and 3.15) accepted. Among the higher education institutional students, undergraduates are accepted neutrally (mean=3.00) for the knowledge improvement through online learning, while others are a little bit more satisfied with the improvements. Here, according to the correlation analysis, educational levels are significantly correlated with knowledge improvements through online learning. The significant value is 0.205 (P > 0.05). The alpha value was greater than at a significant level of 0.01 (covariance = 0.339). Therefore, the e-learning system is mostly successful with well-educated students or those studying in higher institutions. According to the offline study methods, 16.3% of television and 2.4% of radio are used by students. 32.1% of them are not used as offline study methods, but 57.3% of students are involved in self-learning.

Table 6: Reasons Why Plantation Students Like the E-Learning System

Reason for Like the E-Learning System	Percentage
Due to the Covid-19 (Safety)	66.4%
Learning from Home	31%
Learn and ask questions without fear	9.1%
Better Time Management	15.5%

I can easily join the class from anywhere	18.5%
Low cost Compare with school/university	7.8%
Freedom of Environment	14.2%
Lack of Control by the Teacher/Lecturer	5.6%
Better than School/University learning Methods	5.2%

According to table 6, most students like e-learning due to the following reasons: Covid-19 (Safety), Learning from Home, Better Time Management, I can easily join the class from anywhere and Freedom of the Environment. At the same time, most students dislike the e-learning system due to the lack of network coverage, being unable to understand the session clearly, being unable to discuss with others, and finding it difficult to communicate with teachers, lecturers, and friends. Learning in a family environment is not suitable for e-learning. 11.2% of them do not have any device to participate in e-learning. 3.6 percent of this network's users have outstanding 4G coverage, 31.6 percent have good coverage, 29.6 percent have neutral coverage, 26.0 percent have poor coverage, and 9.2 percent are unable to receive 4G coverage for a variety of reasons. Lack of telecommunication infrastructure, different land structures, and dynamic variations in climate in living locations such as rainy and cloudy days are only a few examples. Table 07 mentioned that Why Plantation Students dislike the E-Learning System. Currently, most students have to travel longer distances to get to a convenient school, as well as the nearest schools are limited to primary education. The private classes are based in the town, and it is very hard to reach by estate students. Those factors cause difficulties in several ways. Therefore, most of them are preferable to learning online. Others also dislike the online learning method due to the unsuccessful practices in the Covid-19 situation.

Currently, most of the students have to travel longer distances to get to facilities, as well as the nearest schools are limited with primary education and education levels also backward. The private classes are based on the town and it is very hard to reach by estate students. It makes very difficulties in several ways. Therefore most of them are preferable to learn online. Others also dislike the online learning method due to the unsuccessful practices in the Covid-19 situation.

Table 07: Reasons Why Plantation Students dislike the E-Learning Method

Reason for Dislike the E-Learning System	Percentage
Unable to understand the Session Clearly	30.6%
Lack Of Network Coverage	53.2%
Unable to discuss with others	20.4%
It is difficult to communicate with Teachers/lecturers	20.9%
I don't own a smartphone or a computer for e-learning	11.2%
Not Interested	22.6%
Family environment not suitable for Learning	27.2%
Over workload than School/university Activities	17%
High Cost for the Network Access	15.3%
I couldn't ask any questions	7.2%
Disturbance Increased during the class or Lectures	16.2%
Avoiding Learning from Home	9.8%
Unable to contact with friends	18.7%

The following effects are observed during online learning.23.5% of those affected by sleep disturbances, 38% of depression, 64.1% of eyes that begin to burn and itch, 38% of neck problems, 12.8% of increased illnesses, 54.7% of headaches, and 9.8% of those said to have no effect. After Covid-19 or the normalcy of school and university activities, higher education students are more likely (Mean value > 3.60) to continue their education online, while OL and A/L students are only partially accepted (Mean value 2.50) and primary and secondary students dislike that (Mean value < 2.50).

4.4 Socio-psychological challenges of plantation students in online education during the Covid-19 pandemic

Plantation settlement is different from rural and urban settlement as well is it call line settlement generally majority of estate sector population living in line settlement. Those settlements build British colonial government of Sri Lanka in 1920/30s. Now line settlements' infrastructure changed and developed before but those settlements haven't proper space of healthy living style. Students can't study without disruptions because large number of families living with particular place so television and radio sounds, people voices always disturbed them. Social Capital is weak in estate sector because of lack of social and economic, Infrastructure facilities. Generally there is no role model and no motivations for education achievement because of their living pattern and life styles, relatives, neighborhoods and friends are in estate background and their life circle based on estate social system so children need more motivation and guidelines for their social mobility. It is Labor community so there are luck of motivation and social support also. Some plantation students dropped out their education and went to Colombo as labor. Students faced disappointment with their educations because long time continually schools are closed by Covid-19 preventive activities. This type of online education does kind of symbolic violence because it emerge so many so psychological issues among estate school students. Free education facilities and education for all policy but now education facilities based on social and economic status. There are need some extra tools to improve education so poor people are suffering and they are worrying about their education, future and future.

5. Conclusion

Economically manageable people can benefit more from online schooling than poor people. Poor individuals have faced a number of challenges when it comes to online education. Estate education is already slipping behind that of cities and rural areas. Because of cultural capital, habitués, and inadequate economic capital, online education has a detrimental impact on estate education. The following are the main factors influencing the declining trend of the E-Learning System in Plantation: This includes a lack of ICT infrastructure in plantations and rural areas, a lack of opportunities and resources for self-learning, the high cost of computer technology devices and the poverty of livelihoods, a low level of GDP, and a lack of investment in digitalization and telecommunication services, setbacks in education and English, a lack of technology opportunities, and inadequate computerization of information technology in the field of education. Therefore, effective policy and institutional measures are vitally important to address these shortcomings and move towards the sustainable development of the e-learning system in plantations as well as Sri Lanka. Because digitalization is the vital infrastructure for the sustainable development of social, economic, and political sectors, and because it helps us

successfully communicate with each other for several purposes and in various situations (like the situation of Covid-19), it also provides the sustainable pathway to adequate the next generation for the artificial world.

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