International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

Coping with COVID-19: Gender responses on Economic and Social sustenance Through ICT use

Chukwuma Mgboji [1,*], Nnenna Ibezim [2], Nannim Fadip [3], Ogochukwu Nwosu, [4]

[1] Department of Computer and Robotics Education,
University of Nigeria, Nsukka, Nigeria
chukwuma.mgboji@unn.edu.ng

[2] Department of Computer and Robotics Education,
University of Nigeria, Nsukka, Nigeria
nnenna.ibezim@unn.edu.ng

[3] Department of Computer and Robotics Education,
University of Nigeria, Nsukka, Nigeria
nfadip@gmail.com

[4] Department of Computer and Robotics Education,
University of Nigeria, Nsukka, Nigeria

Corresponding author: chukwuma.mgboji@unn.edu.ng

Article History
Receive Date: 2022/6/28
Revise Date: 2022/7/15
Accept Date: 2022/7/18
Publish Date: 2022/7/22

Abstract

The COVID-19 pandemic is threatening the economic, educational, religious, social and wealth being of people globally. This is as a result of lockdown imposed by government of various nations to cope the spread of the virus. This study focused on investigating activities that sustained people during the lockdown. A mixed method design was adopted for the study. The sample of the study was made up of 310 participants. An online questionnaire with a reliability of 0.903 was used for data collection. The result of the study revealed the frequently used ICTs during the lockdown , the activities which sustain people during lockdown, the economic and social implication of use of ICT during the COVID-19 lockdown. The identified challenges to utilization of ICT during lockdown include: lack of adequate infrastructure for E-learning, inconsistent power supply, inadequate cash to buy data, and limited/unsteady internet access. It was therefore recommended that government should implement policies that will enhance quality of data network and also reduce the cost of mobile data subscription and other forms of subscriptions.

Keywords: *COVID-19, Economic and Social sustenance, ICT*

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

Introduction

The enormous role being played by Information and Communication Technology (ICT) facilities during the ongoing Coronavirus Disease 2019 (otherwise known as COVID-19) pandemic, and the resulting global lockdown cannot be overemphasized. The lockdown, which could be seen as restriction of persons from entering or leaving buildings, their houses or area freely as a result of the emergency situation, has resulted to the collapse of economies, and suspension of physical and social interaction between people. It has also led to the suspension of all sporting activities such premiership games, and European Champions leagues; closure of places of worships such as Churches, Mosques, and Synagogues; closure of markets and any form of physical gathering with the aim of cubing the spread of the highly infectious COVID-19 (World Health Organization [WHO], 2020a).

COVID-19 is widely acknowledged to have originated in Wuhan, China in December 2019 (Yang, Shang & Rao, 2020). The Novel virus was declared a Public Health Emergency of International Concern (PHEIC) in the end of January 2020 by WHO. On the 11th of March 2020, COVID-19 was declared a global pandemic by WHO (Shaw, Kim & Hua, 2020). According to WHO COVID-19 situation report of 12th May, 2020, there is a total confirmed case amounting to 4,088,848, and a total death of 283,153 (WHO, 2020a). The report shows that United States of America has recorded the highest number of casualties so far with 1,298,287 confirmed infected cases and 78,652 deaths. This was followed by the Russian Federation which has recorded 232,243 confirmed cases and 2,116 deaths, Spain 227,436 confirmed cases and 26,744 deaths, The United Kingdom 223,064 confirmed cases and 32,065 deaths, and Italy 219,814 confirmed cases and 30,739 deaths. While China, where the first case of the virus was reported has a total of 84,451 confirmed infected cases and 4,644 deaths (WHO, 2020a). Statistics from the top four most infected Africa countries shows that; South Africa has a total confirmed case of 10,652 and 206 deaths, Algeria has 5,891 confirmed infected cases and 507 deaths, Ghana has 4700 confirmed infected cases and 22 deaths while Nigeria has a total confirmed case of 4641 and 150 deaths.

More so, it is found that the aged and patients with low immunity, Pneumonia, diabetes and other chronic respiratory diseases including Tobacco smoking or underlying medical conditions are more vulnerable to COVID-19 (Guo et al., 2020; WU et al., 2020; Li et al., 2020; WHO, 2020a). It is characterized with high rate of spread as a result of higher mobility of people in a globally interconnected world (Shaw, Kim & Hua, 2020). This Challenge pose by COVID-19 has led to a global lockdown of all form of activities with exception of some essential or sensitive services. The virus has critically affected the healthcare infrastructure of different countries, affected the economy and social activities which characterized daily activities of individuals (Hynes, Linkov & Trump, 2020; Abhiyan, 2020).

However, the 21st century technology powered by internet/social networking has appeared to play a major rule in cushioning the impact of the global lockdown through provision of an enabling environment for sharing of information and communication which include: work from home (telework), online course delivery, socialization, entertainment and religious services during the confinement (Balram, 2020; Leidner, 2020). This experience will force one to wonder how life would have been like during a life-threatening pandemic like this without these modern ICT infrastructures. Leidner (2020) in her editorial reflection wondered how the humanity survived the Bubonic plague which caused 200 million deaths in 1400s, the 1600 Smallpox pandemic which killed about 56 million people, and the Flu Pandemic of 1918 which killed between 40 to 50 million people. The question one will ask is that how did they gather information, how did they isolate or protect themselves, and when to resume normal life? Inasmuch as limited information may be responsible for such higher deaths recoded considering the world population at that time as compared with the present, it could be said that the proliferation of ICT infrastructure is timely at minimizing the hardship and death toll as a result of this pandemic.

As a result of this pandemic, the last few months has recoded significant attention to words such as "lockdown", "social distancing or physical distancing", "self-isolation", "14 days quarantined" "community spreading", breaking the chain" "flattening the curve" etc. These terminologies are used for the sole purposes of containing the spread of the COVID-19 since there is no confirmed vaccine or drugs for the cure of the virus. Therefore, the best way to cubing the spread is to isolate people from large or social gathering, and isolate confirmed cases for quarantine (WHO, 2020b, COVID-19 is a 'controllable Pandemic', 2020). ICTs now plays a vital role through the strong will of government and community participation. ICT is used for contact tracing so as to isolate and quarantine the confirmed cases. The lockdown necessitated by the infectious nature of the virus has huge toll on the government, organizations and private individuals.

COVID-19 pandemic is threatening the economic, educational, religious and social interaction and wealth being of people globally (Van Bavel et al., 2020; Radulescu & Cavanagh, 2020). The economy of the world is now delving towards recession. This is evidenced in the fall in Gross Domestic Product (GDP) of different countries (Fernandes, 2020; Sohrabi, et al., 2020; Armocida et al., 2020). Fernandes (2020) found that at minimum, the GDP during the lockdown will be depleted between 3-6% based on countries source of income, in fact some countries will record a fall in GDP of between 10% to 15%. For example, service-oriented countries such as Greece, Portugal, Spain who mostly depends on tourism will be worse affected, with over 15% drop in their GDP. Countries depending on international trade will be more affected, and on average, every additional month

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

of the lockdown will cost about 2.5 to 3% of the global GDP.

The education sector was not also left out due to the lockdown. Many schools world over were on lockdown in a bit to curtail the spread of the virus. The religious institutions were also locked down. For example, services and worship in churches and mosques were barred by government of various nations, all in the bit of instituting social or physical distancing which is an effective way of stopping the spread of the virus. According to Baldwin and Mauro (2020), this virus is not just contagious medically, but also economically. Markets and other commercial activities were also on hold, resulting to a negative effect on the means of livelihood of many (Shaw, Kim & Hua, 2020).

The New York Times of March 26, 2020 reported that over 3 million Americans lost their jobs within the preceding week, and if the trend continues, it will result in a painful downturn in which an additional 26 million job will be lost (More than 3 Million Americans Lost their Jobs Last Week, 2020). The OECD's forecast for 2nd March, 2020 shows that Italy and France are slipping into recession, and the International Monetary Fund (IMF) has warned of dire possible recession globally (Baldwin & Mauro, 2020). The impact of this could be seen from the increasing rate of unemployment since the commencement of this pandemic (McKibbin & Fernando, 2020; Guerrieri, 2020; Shojaei, & Masoumi, 2020), and the effort being made by various governments to provide palliatives to their citizens because they can no longer provide for themselves and their families.

Previous studies have shown that ICT is very effective at solving or reducing the impact of varying challenges confronting human existence such as disaster (Castillo, 2016; Heinzelman & Waters, 2010; Day, Junglas, & Silva, 2009), crisis (Leong et al., 2015; Pan, Pan, & Leidner, 2012), and emergency response (Valecha et al., 2019, Heinzelman & Waters, 2010; Chen et al., 2008). Similarly, ICT is playing a significant role during this lockdown towards connecting people together even as they are isolated or physically separated from one another. It has been commented that this outbreak has offered a unique opportunity for vendors offering communication and collaboration services such as Videochat apps, or other productivity software/platforms like Wechat, Skype and Zoom (TELECOM Review, 2020). Other social or collaborative apps like Facebook, WhatApp, and Twitter are also expected to experience increasing patronage. The pertinent question one will be forced to ask is: how has ICT really played a critical role in helping fight this pandemic both economically and socially? The economic perspective in this study refers to the use of ICT for financial benefits or careful use of money and resources with the help of ICT. The social perspective refers to the use of ICT during lockdown for the purposes of having company of others, especially pleasure or other forms of interaction; in a social manner.

Reviewed literature showed low documentation on the statistics on how various ICT are being used to cope with COVID-19 pandemic, the opportunities which are there to explore for the economic and social benefits of individuals, and also in contributing to the fight against COVID-19. It has also been shown that leveraging on ICT has the capability of sustaining economies and income of individuals because it has no place and time constrains. This study aimed at filling the gap, thereby informing the government, policy makers and software developers, of the need to develop software which are capable of reducing the negative impact of the global lockdown as a result of the COVID-19 pandemic. Opportunities to be explored for better their living during the pandemic, through ICT use are hoped to be exposed.

Therefore, this study investigates the frequency of use of ICT during lockdown, what ICTs sustained people during the lock down, the economic and social implications of the use of ICTs, and what challenges are being encountered in utilization of these ICTs within the COVID-19 lockdown. The influence of gender, occupation and age groups of respondents on frequency of use of ICT during the lockdown was also tested.

Methodology

This study adopted the mixed method, which include collecting both the quantitative and qualitative data. The quantitative part of this study is a descriptive survey, whereas the qualitative part is interview sessions. A total of 310 valid responses were retrieved. The demographic information elicited from the first part of the instrument is presented below.

Table.(1) Demographic Information by Sex

Variable		Sex		Total
		Male	Female	
Occupation	Lecturers/Teachers	63	56	119
	Private Sector	15	19	34
	Business People	9	14	23
	Other Civil Servants	30	26	56
	Students	32	46	78
Total		149	161	310
Age	16-25 years	17	29	46
	26-40 years	105	86	191
	41 years and Above	27	46	73
Total		149	161	310

The instrument used for data collection is a validated questionnaire. The 51 items online questionnaire was developed using Google form, to investigate the economic and social implication of the use of ICTs within the COVID-19 lockdown. For quantitative data collection, the closed ended questions on the questionnaire were used. The closed ended questionnaire has an overall reliability is 0.903. The online questionnaire was distributed to

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

respondents via e-mails, Facebook and WhatsApp platforms. The online questionnaire was allowed a period of one week with the respondents before closing it. The quantitative data was analyze using means and standard deviations, while t-test and Analysis of Variance (ANOVA) were used in testing the hypothesis. The Statistical Package for Social Sciences (SPSS) was used in analyzing the data. The qualitative data were collected through the open-ended questions based on the research objectives and the analyses was done with the help of qualitative software atlas.ti. The open-ended responses allowed the researchers to explore reasons for the closed-ended responses and identified any comments people might have that are beyond the responses to the closed-ended questions (Creswell, 2012). All ethical consideration for the conduct of research were strictly adhered to.

Results

The result of this study is presented based on the research questions guiding the study.

Research question 1- What is the frequency of use of ICT during the lockdown?

The result is presented in (Table.2)

Table.(2) Mean and Standard Deviation of the frequency of use of various ICT during lockdown

S/N	Items	N	M	SD	Remark
1	Frequency of use of mobile phones during the Covid-19 lockdown	310	3.69	.49	FU
2	Frequency of use of Laptops during the Covid-19 lockdown	310	2.61	.89	MU
3	Frequency of use of Facebook during the Covid-19 lockdown	310	2.95	.89	MU
4	Frequency of use of YouTube during the Covid-19 lockdown	310	2.50	.84	MU
5	Frequency of use of Twitter during the Covid-19 lockdown	310	1.79	.95	RU
6	Frequency of use of WhatsApp during the Covid-19 lockdown	310	3.75	.48	FU
7	Frequency of use of Instagram during the Covid-19 lockdown	310	1.96	.99	RU
8	Frequency of use of Video Chat/Video conferencing software during the Covid-19 lockdown	310	2.17	.92	RU
9	Frequency of use of Zoom during the Covid-19 lockdown	307	1.70	.87	RU
10	Frequency of use of Skype during the Covid-19 lockdown	308	1.29	.59	RU
11	Frequency of use of Telegram during the Covid-19 lockdown	310	1.68	.87	RU
12	Frequency of use of LinkedIn during the Covid-19 lockdown	310	1.53	.78	RU
13	Frequency of use of Tik Tok during the Covid-19 lockdown	310	1.27	.63	RU

Key: N=Number of Valid Cases, M = Mean, SD = Standard Deviation

1.00-2.33=Rarely Used (RU), 2.34-3.33=Moderately Used (MU), 3.34-4.00=Frequently Used (FU)

Table 2 shows that the most frequently used ICTs during the COVID-19 lockdown were: WhatsApp (M = 3.75) and Mobile Phone (M = 3.70). This is followed by Facebook (M = 2.95), Laptops (M = 2.61), YouTube (M = 2.50), Video Chat/Video Conferencing software (M = 2.17) which are moderately used. The least used ICT facilities during the lockdown were: Tik Tok (M = 1.27), Skype (M = 1.29), Linkedln (M = 1.53), Telegram (M = 1.68), Zoom (M = 1.70), Twitter (M = 1.80) and Instagram (M = 1.96). Results of open-ended responses relating to this is shown in the word cloud below:

Figure 1. Atlas.ti Word Cloud on Most Commonly Used ICTs during Lockdown

The Influence of Gender on Frequency of Utilization of ICT during Lockdown An -independent t-test was computed at 0.05 level of significance and result is presented in **Table 3.**

Table. (3) Summary of t-test on Influence of Gender on Frequency of Use of ICT During Lockdown

Sex	N	Mean	SD	t	Sig. (2-tailed
Male	149	2.22	0.41	.060	.952
Female	161	2.22	0.41		

Table 3 shows that both the male and female respondents had a mean rating of 2.22 (SD = 0.41). The results also show no statistically significant difference between the male and female respondents on their frequency of use of ICT during the lockdown t = 0.60, P≥0.05. This shows that both male and female respondent do not differ in their responses.

Frequency of Utilization of ICT During Lockdown Based on Occupation

The mean and standard deviation of respondents showing the frequency of use of ICT based on occupation is presented in **Table 4.**

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

Table. (4) Mean and Standard Deviation of frequency of Use of ICT Based on Occupation

Occupation	N	Mean	SD
Lecturers/Teachers	119	2.27	.46
Private Sector	34	2.33	.48
Business People	23	2.10	.32
Other Civil Servants	56	2.24	.38
Students	78	2.13	.32
Total	310	2.22	.41

Results in Table 4 show that the Private Sector had the highest mean rating 2.33 (SD = 0.48), followed by Lecturers/Teachers who had a mean rating of 2.27 (SD = 0.46), other Civil Servants (M = 2.24, SD = 0.38). Students had a mean of rating of 2.13 (SD = 0.32) while the Business People had the least mean rating of 2.10 (M = 0.32).

Table. (5) Oneway ANOVA on Frequency of Used of ICT During Lockdown based on Occupation

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.652	4	.413	2.486	.044
Within Groups	50.678	305	.166		
Total	52.330	309			

Results in **Table.5** show that there was a significant difference in use of ICT during lockdown among the various occupational groups in the study F(4, 309) = 2.486, p≤0.05. This shows that the respondents vary in their use of ICT during lockdown based on their occupation. A Scheffe Post hoc test run at 0.05 level of significance to determine where the differences between the five groups lies, show no statistically significant difference among the various groups in the study (p>0.05 for all multiple comparisons among the occupation groups). This means that, although the respondents differ in their frequencies of use of ICTs during the lockdown, the difference were not significant enough to differ one group from another.

Frequency of Use of ICT During Lockdown Based on Age Group

Table 6 shows the mean and standard deviation of used of ICT during lockdown based on age group of the respondents.

Table. (6) Mean and Standard Deviation of Frequency of Used of ICT facilities During Lockdown

Age Group	N	Mean	SD
16-25 years	46	2.13	0.32
26-40 years	191	2.24	0.42
41 years and Above	73	2.23	0.45
Total	310	2.22	0.41

Results in Table 6 show that the age group of 26-40 years are more frequent in use of ICT during the lockdown, with a mean rating of 2.24 (SD = 0.42), followed by those with 41 years and above 2.23 (SD = 0.46). Those between the ages of 16-25 years had the least mean rating of 2.13 (SD = 0.323)

Table. (7) Oneway ANOVA on Frequency of Use of ICT During Lockdown Based on Age Group

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.528	2	.264	1.563	.211
Within Groups	51.803	307	.169		
Total	52.330	309			

Results in Table 7 show that there is no statistically significant difference between the age groups based on their frequency of use of ICT during the lockdown F(2, 307) = 1.563, P≥0.05. This means the respondents do not differ in their responses with respect the frequency of ICT use during the lockdown based on age groups.

Research Question 2: Which ICT activities sustained people during the lockdown?

The Means and Standard Deviation of their responses were computed. The quantitative result is presented in **Table 8**. While, the word cloud for qualitative data is presented in **Figure 2**

Table. (8) Mean and Standard Deviation of Activities that Sustained People During Lockdown

S/N	Items	N	Mean	SD	Remark
1	How browsing the internet for information/research sustained people during the Covid-19 lockdown	308	3.32	.76	MS
2	How calling the disease control centre for help sustained people during the Covid-19 lockdown	294	1.33	.68	LS
3	How online educational activities sustained people during the Covid-19 lockdown	304	2.73	.94	MS
4	How online worship services sustained people during the Covid-19 lockdown	306	2.68	1.05	MS

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

5	How calling/chatting friends and family sustained people during the Covid-19 lockdown	307	3.44	.74	HS
6	How seeing movies online sustained people during the Covid-19 lockdown	306	2.59	1.04	MS
7	How online businesses sustained people during the Covid-19 lockdown	303	1.94	1.01	LS
8	How working from home sustained people during the Covid-19 lockdown	306	2.24	1.06	LS
9	How reading news online sustained people during the Covid-19 lockdown	307	3.08	.91	MS
10	How conducting online researches sustained people during the Covid-19 lockdown	297	2.58	1.06	MS

Key: N=Number of Valid Cases, M = Mean, SD = Standard Deviation
1.00-2.33=Least Sustainable (LS), 2.34-3.33=Moderately Sustainable (MS), 3.34-4.00=Highly Sustainable (HS)

Table 8 shows that the activity that sustained people during the lockdown most is calling/chatting friends and family (M=3.44). It is followed by browsing the internet for information/research (M=3.31), reading news online (M=3.08), online educational activities (M=2.74), online worship services (M=2.68), conducting online research (M=2.58) and watching online movies (M=2.51) which moderately sustained the respondents. Working from home (M=2.24), online businesses (M=1.94), and calling the disease control centre for help (M=1.33) are the least sustainable activities with ICT during the lockdown. The word query cloud for the open-ended part of the instrument is shown in Figure 2.

Figure 2 Word cloud from atlas.ti on what sustained people during the lockdown

Research question 3 was on economic implication of use of ICTs during lockdown. The respondents' response with respect to this is presented in Table 9.

Table. (9) Mean and Standard Deviation of Economic Implications of Use of ICTs During lockdown

S/N	Items	N	Mean	SD	Remarks
1	The extent of buying recharge cards during the Covid-19 lockdown	307	3.31	.83	MEI
2	The extent of buying internet bundles during the Covid-19 lockdown	306	3.54	.72	HEI
3	The extent of charging of laptops/phones during the Covid-19 lockdown	306	3.61	.66	HEI
4	The extent of downloading apps for learning and worship during the Covid-19 lockdown	303	2.96	.85	MEI
5	The extent of buying fuel for generators during the Covid-19 lockdown	303	2.70	1.08	MEI
6	The extent of paying for online courses during the Covid-19 lockdown	299	2.01	.95	LEI
7	The extent of running online businesses during the Covid-19 lockdown	297	2.13	1.00	LEI
8	The extent of payment of utility bills during the Covid-19 lockdown	298	2.77	.89	MEI
9	The extent of making purchases during the Covid-19 lockdown	301	2.91	.91	MEI
10	The extent of generating more income during the Covid-19 lockdown	300	1.70	.76	LEI
	Cluster3_Mean	307	2.76	.52	
	Valid N (listwise)	293			

Key: N=Number of Valid Cases, M = Mean, SD = Standard Deviation
1.00-2.33=Low Economic Implication (LEI), 2.34-3.33=Moderate Economic Implication (MEI), 3.34-4.00=High Economic Implication (HEI)

Table 9 shows that the items which had high economic implication on respondents during the lockdown were charging of laptops/phone (M = 3.62), buying internet bundles (M = 3.54). Buying of recharge cards (M = 3.31), downloading app for learning worship purposes (M = 2.96), making purchases (M = 2.90), payment of utility bills (M = 2.77), and buying fuel for generators (M = 2.70). Items with low economic implication were running online businesses (M = 2.13), paying for online courses (M = 2.01), and generating more income (M = 1.70). The cluster mean of 2.76 showed an overall moderate

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

economic implication on ICT use during the COVID-19 lockdown.

Research question 4 was on social implication of use of ICT during lockdown. The result is presented in **Table 10**.

Table. (10) Mean and Standard Deviation of social implications of use of the ICTs during lockdown

S/N	Items	N	Mean	SD	Remark
1	The extent ICT is used in communicating with family members during the Covid-19 lockdown	302	3.31	.76	MSI
2	The extent ICT is used in video conferencing and meetings during the Covid-19 lockdown	295	2.56	1.07	MSI
3	The extent of ICT use in catching up with old/lost friends during the Covid-19 lockdown	299	2.91	.90	MSI
4	The extent ICT is used in making more phone calls during the Covid-19 lockdown	300	3.21	.77	MSI
5	The extent ICT is used in religious group interactions during the Covid-19 lockdown	299	2.94	.90	MSI
6	The extent ICT use increased communication with friends during the Covid-19 lockdown	301	3.22	.78	MSI
7	The extent ICT use increased communication with colleagues during the Covid-19 lockdown	299	3.06	.82	MSI
8	The extent ICT use increased interaction with clients during the Covid-19 lockdown	293	2.5	.95	MSI
	Cluster4_Mean	303	2.98	.63	MSI
	Valid N (listwise)	289			

Key: N=Number of Valid Cases, M = Mean, SD = Standard Deviation
1.00-2.33=Low Social Implication (LSI), 2.34-3.33=Moderate Social Implication (MSI), 3.34-4.00=High Social Implication (HSI)

Results in Table 10 show that all the eight (8) items in the cluster had mean ratings between 2.34-3.33 and a cluster mean of 2.98. This means that the respondents response shows a moderate social implication of use of ICTs during the lockdown. The mean ratings of the various items based on their extent of uses are: communication with family members (M = 3.31), communication with friends (M = 3.23), Phone calls (M = 3.21), Communication with Colleagues (M = 3.06), religious group interaction (M = 2.95), catching with old/lost friends (M = 2.91), video conferencing and meeting (M = 2.56), and interaction with clients ((M = 2.55)

Research question 5 investigated the agreement level of the respondents on challenges that affects the utilization of ICTs during the lockdown. Mean and standard deviation of their responses were computed and result presented in **Table 11**.

Table.(11) Challenges to utilization of ICTs during the lockdown

S/N	Items	N	Mean	SD	Remark
42	Agreement level on waste of useful time daily as a challenge of ICT use during the Covid-19 lockdown	300	2.89	.81	MC
43	Agreement level on laziness and idling away as a challenge of ICT use during the Covid-19 lockdown	302	2.94	.80	MC
44	Agreement level on inadequate cash to buy data as a challenge of ICT use during the Covid-19 lockdown	301	3.24	.82	MC
45	Agreement level on being limited to clients that are not ICT enabled as a challenge of ICT use during the Covid-19 lockdown	297	3.06	.81	MC
46	Agreement level on lack of adequate infrastructure for E-learning as a challenge of ICT use during the Covid-19 lockdown	298	3.41	.78	MC
47	Agreement level on inconsistent power supply as a challenge of ICT use during the Covid-19 lockdown	302	3.27	.87	MC
48	Agreement level on limited/unsteady internet access as a challenge of ICT use during the Covid-19 lockdown	302	3.07	.86	MC
49	Agreement level on unsteady information dissemination as a challenge of ICT use during the Covid-19 lockdown	300	2.80	.84	MC

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

Key: N=Number of Valid Cases, M = Mean, SD = Standard Deviation
1.00-2.33=Least Challenging (LC), 2.34-3.33=Moderately Challenging (MC), 3.34-4.00=Highly Challenging (HC)

Table 6 shows the means rating on challenges to utilization of ICT during the lockdown in decreasing orders of magnitude, they are: lack of adequate infrastructure for E-learning (M = 3.40), inconsistent power supply as a challenge (M = 3.27), inadequate cash to buy data (M = 3.24), limited/unsteady internet access (M = 3.07), being limited to clients that are not ICT enabled (M = 3.06), laziness and idling away (M = 2.94), waste of useful time daily (M = 2.89), unsteady information dissemination (M = 2.80)

Discussion

This study investigated the frequency of use, economic and social implications, and challenges to use of ICTs within the COVID-19 lockdown. Research question 1 was on frequency of use of ICTs during lockdown. Results in Table 2 show that the most frequently use ICTs during the COVID-19 lockdown were: WhatsApp (M = 3.75) and Mobile Phone (M = 3.70). This was followed by Facebook (M = 2.95), Laptops (M = 2.61), YouTube (M = 2.50), Video Chat/Video Conferencing software (M = 2.17) which had moderate frequency of used. The responses show that the least used ICT facilities during the lockdown were: Tik Tok (M = 1.27), Skype (M = 1.29), Linkedln (M = 1.53), Telegram (M = 1.68), Zoom (M = 1.70), Twitter (M = 1.80) and Instagram (M = 1.96). Other items identified to be used frequently by the respondents during the lockdown as visualized on word frequency query cloud in Figure 1 include: Microsoft office team, Google Classroom, Instagram, Wipod, Online food delivery application, online shipping stores, Triller, Music, Snapchat, television, email, Big blue button, computer games, google map, Google meet, GoToMeeting application, Radio, Palmchat, Mixlr, CISCO Webex, Canvas, and Google Duo. Many studies have identified these ICTs as often used during lockdowns (see Pan, Cui, & Qian, 2020; de Haas, Faber, & Hamersma, 2020; Jones et al., 2020).

Results on influence of gender on frequency utilization of ICTs during lockdown in Table 3 show no statistically significant difference between the male and female respondents on their frequency of use of ICT during the lockdown $t = 0.60$, $P \geq 0.05$. This shows that both male and female respondents do not differ in their responses. This result could be due to the fact that both the male and female respondents stayed at home and the only thing that could keep them getting in touch with love ones and colleagues is the ICTs. Results on frequency of utilization of ICT during the lockdown based on occupation in Table 4 show that the Private Sector had the highest mean rating, followed by Lecturers/Teachers, and other Civil Servants. Students and Business People had lower mean ratings compared to other groups in the study. Table 5 show that there is a statistically significant difference in use of ICT during lockdown among the various occupational groups in the study $F(4, 309) = 2.486$, $p \leq 0.05$. This shows that the respondents vary in their use of ICT during lockdown based on their occupation. A Scheffe Post hoc test run at 0.05 level of significance to determine where the differences between the five groups lies, show no statistically significant difference among the various groups in the study ($p>0.05$) for all multiple comparisons among the occupation groups. This show that, although the respondents differ in their frequencies of use of ICTs during the lockdown, the difference were not significant enough to differ one group from another. The reason for this could still be that everyone is staying at home, therefore most have been using ICT for any of the functions relating to their Occupation. For example, the Private Sector having the highest mean rating is not surprising because most of the ICT firms are owned by the private individuals. Also, for private sector to survive the lockdown, they have to transfer their transaction to online platforms. For lecturers and teacher, it is also expected because they often rely on the internet for most of their researches and teaching activities. Studies have also shown how online learning and teaching has become one of the major activities during lockdown (Shenoy, Mahendra, & Vijay, 2020; Malhotra, 2020) since there is no physical contact due to fear of contacting COVID-19.

Results on frequency of use of ICT during the COVID-19 lockdown based on age of respondents in Table 6 show that the age group of 26-40 years are more frequent in use of ICT during the lockdown, with a mean rating of 2.24 (SD = 0.42), followed by those with 41 years and above who had a mean rating of 2.23 (SD = 0.46). Those between the ages of 16-25 years had the least mean rating of 2.13 (SD = 0.323). Table 7 show that there was no statistically significant difference between the age groups based on their frequency of use of ICT during the lockdown. This means that the respondents do not differ in their responses with respect the frequency of us of ICT during lockdown based on age grouping. The age range of 26-40years is the most youthful age, and studies have shown that young people are tech savvy (Nagar, 2020; Sahu, 2020) as compared to elderly group. This youthful age group is also the most productive, therefore to keep on with their daily activities, they have to rely heavily on ICTs to achieve their goals.

Research question 2 investigated activities that sustained people during lockdown. The results in Table 8 show that the activity that sustained people during the lockdown the most is calling/chatting friends and family (M=3.44). It was followed by browsing the internet for information/research (M=3.31), reading news online (M=3.08), online educational activities (M=2.74), online worship services (M=2.68), conducting online research (M=2.58) and watching online movies (M=2.51) which moderately sustained the respondents. Working from home (M=2.24), online businesses (M=1.94), and calling the disease control centre for help (M=1.33) are the least sustainable activities with ICT during the lockdown.

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

Others activities that sustain people as shown in Word Cloud in Figure 2 include: online business, indoor games, family bounding, reading books, playing online games, trying new food recipes, watching Movies, exercising or going for walks, sleeping, free webinars, online learning, online betting, farming, praying (Prayer), studying the word of God, distribution of palliatives to the poor, doing research, publishing of articles, and chatting. This qualitative finding refined and extent the quantitive data. Similar studies have shown how important these ICTs are helping people cope with COVID-19 pandemic and lockdown (Oe, & Weeks, 2020; Arshad, 2020; Bakibinga-Gaswaga et al., 2020; Meinzen-Dick, 2020).

Research question 3 was concerned with the economic implication of use of ICTs during lockdown. As shown in Table 9, the items which had high economic implication on respondents during the lockdown were charging of laptops/phone (M = 3.62), buying internet bundles (M = 3.54). Although these might not be issues in developed countries or countries with stable power supply, it is an issue in the population of this very study (Nigeria) because Nigeria still battles the problem of erratic power supply. The following was rated by respondents as having moderate economic implication: buying of recharge cards (M = 3.31), downloading app for learning/worship purposes (M = 2.96), making purchases (M = 2.90), payment of utility bills (M = 2.77), and buying fuel for generators (M = 2.70). Items rated as having low economic implication were: running online businesses (M = 2.13), paying for online courses (M = 2.01), and generating more income (M = 1.70). The cluster mean of 2.76 showed an overall moderate economic implication on ICT use during the COVID-19 lockdown. Recent studies have shown that COVID-19 pandemic greatly affected the society and economic activities around the world (Hayashi, & Matsuda, 2020). Studies by Lekfuangfu et al. (2020); Abay, Tafere, and Woldemichael (2020) have shown how ICT has step in to cushion the hardship been experienced as a result of COVID-19 pandemic. Király et al. (2020) also identify the critical role of ICT in keeping the economy going, allowing large group of people to work from home, enabling social connectedness and entertainment as some important role of ICT in coping COVID-19 pandemic and lockdown.

Also, the respondents rating on social implication of use of ICT during the COVID-19 pandemic and lockdown in Table 10 shows that: all the items in the cluster had mean ratings between 2.34-3.33 and a cluster mean of 2.98. This means that the respondents response shows a moderate social implication of use of ICTs during the lockdown. They items are: communication with family members, communication with friends, Phone calls, Communication with Colleagues, religious group interaction, catching with old/lost friends, video conferencing and meting, and interaction with clients. Many studies have identified these as some to the activities that help people to cope during the ongoing COVID-19 pandemic (Oe, & Weeks, 2020; Arshad, 2020; Bakibinga-Gaswaga et al., 2020; Meinzen-Dick, 2020; Abay, Tafere, & Woldemichael, 2020).

Furthermore, results on challenges to utilization of ICTs during the lockdown in Table 11 show that: the most severed challenge to use of ICT during the lockdown is lack of adequate infrastructure for E-learning. It is followed by inconsistent power supply, inadequate cash to buy data, limited/unsteady internet access, being limited to clients that are not ICT enabled, laziness and idling away, waste of useful time daily, and unsteady information dissemination. Study conducted by Király et al. (2020) found of these challenges as some major problems confronting the use of ICT. Some of these challenges were also identified in (Frost, Nimmons, & Davies, 2020; Bakibinga-Gaswaga et al., 2020).

Conclusion

This study investigated the frequency of use of ICT, the economic and social implications of use of ICT and the challenges confronting the use of ICT during the COVID-19 pandemic and lockdown. Results of this study show that the most frequently used ICTs during the lockdown are WhatsApp and Mobile Phones. Other items with higher frequency of use are Facebook, laptops, YouTube and Videoconferencing facilities. The activities which sustain people in the lockdown included: calling/chatting friends and family, browsing the internet for information/research, reading news online, online educational activities, online worship services, conducting online research and watching online movies, working from home, online businesses, and calling the disease control centre for help. The results also show that overall, socially, the use of ICTs sustained people in fighting Cocid-19 lockdown, and there were increased economic implication to the use of ICTs in to sustain individuals during the lockdown. However, inconsistent power supply, inadequate cash to buy data, limited/unsteady internet access, being limited to clients that are not ICT enabled, laziness and idling away, waste of useful time daily, and unsteady information dissemination were identified as the challenges to the use of ICTs in coping with covid-19 lockdown.

Recommendation

Based on the results of this study, the following were recommended:

1. The government should enact laws that will crash down the high cost of mobile data subscription and other forms of subscriptions (such as DSTV, GOTV etc.).
2. The government should also ensure that free internet bundle is given to every student per month.
   The use of robotics/artificial intelligence and internet of things might be very useful in keeping the virus away from people

Acknowledgements

We thank our colleague's, respondent and all the authors whose works were consulted during the process of this study.

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

Declaration of Conflict of Interests

The authors declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

References

[1] Abay, K. A., Tafere, K., & Woldemichael, A. (2020). Winners and Losers from COVID-19: Global Evidence from Google Search. World Bank Policy Research Working Paper, (9268). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3617347

[2] Abhiyan, J. S. (2020). Understanding the COVID-19 epidemic and the demands of the Peoples Science Movements and Peoples Health Movements. A Background Paper to the Charter of Demands, India. http://resources.aipsn.net/sites/default/files/2020-03/BackgroundPaperFinal-COVID19.pdf

[3] Armocida, B., Formenti, B., Ussai, S., Palestra, F., & Missoni, E. (2020). The Italian health system and the COVID-19 challenge. The Lancet Public Health. https://doi.org/10.1016/S2468-2667(20)30074-8

[4] Arshad, M. (2020). COVID-19: It's time to be Thankful to our ICT Professionals. International Journal of Information Technology and Electrical Engineering, 9(5), 23-32. http://www.iteejournal.org/v9no2apr20_pdf4.pdf

[5] Bakibinga-Gaswaga, E., Bakibinga, S., Bakibinga, D. B. M., & Bakibinga, P. (2020). Digital technologies in the COVID-19 responses in sub-Saharan Africa: policies, problems and promises. The Pan African Medical Journal, 35(38). https://www.panafrican-med-journal.com/content/series/35/2/38/full/

[6] Baldwin, R., & Mauro, B. W. (2020). Economics in the time of COVID-19. Centre for Economic Policy Research, London.

[7] Balram, S. (2020, March 28). Covid-19 Impact: Social media activity in the country grew 50X in early March, says Nielsen. The Economic Times. https://economictimes.indiatimes.com/tech/internet/covid-19-impact-social-media-activity-in-the-country-grew-50x-in-early-march-says-nielsen/articleshow/74833596.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

[8] Brindha, M. D., Jayaseelan, R., & Kadeswara, S. (2020). Social Media Reigned by Information or Misinformation about COVID-19: A Phenomenological Study. ALochna Chakra Journal, IX(IV), 585-602

[9] Castillo, C. (2016). Big crisis data: social media in disasters and time-critical situations. Cambridge University Press. http://bigcrisisdata.org/chapters/Big_Crisis_Data-Carlos_Castillo-Chapter_6-Free_preview.pdf

[10] Chen, R., Sharman, R., Chakravarti, N., Rao, H. R., & Upadhyaya, S. J. (2008). Emergency response information system interoperability: Development of chemical incident response data model. Journal of the Association for Information Systems, 9(3), 200-230.

[11] Cinelli, M., Quattrociocchi, W., Galeazzi, A., Valensise, C. M., Brugnoli, E., Schmidt, A. L., ... & Scala, A. (2020). The covid-19 social media infodemic. arXiv preprint. https://arXiv:2003.05004 .

[12] COVID-19 is a 'controllable pandemic'. (2020, March 12). COVID-19 is a 'controllable pandemic': WHO. Aljazeera. https://www.aljazeera.com/news/2020/03/covid-19-controllable-pandemic-200312163146232.html

[13] Crawford, J., Butler-Henderson, K., Rudolph, J., & Glowatz, M. (2020). COVID-19: 20 Countries' Higher Education Intra-Period Digital Pedagogy Responses. Journal of Applied Teaching and Learning (JALT), 3(1). https://doi.org/10.37074/jalt.2020.3.1.7

[14] Creswell, J. W. (2012). Educational Research: Planning, Conducting, Evaluating Quantitative and Qualitative Research (4th ed.). Boston, Pearson Education Inc.

[15] Day, J. M., Junglas, I., & Silva, L. (2009). Information flow impediments in disaster relief supply chains. Journal of the Association for Information Systems, 10(8), 637-660. https://pdfs.semanticscholar.org/451f/1ae21b106e78e17308ec2b254b684f0fbabb.pdf

[16] de Haas, M., Faber, R., & Hamersma, M. (2020). How COVID-19 and the Dutch 'intelligent lockdown'change activities, work and travel behaviour: Evidence from longitudinal data in the Netherlands. Transportation Research Interdisciplinary Perspectives, 100150. https://doi.org/10.1016/j.trip.2020.100150

[17] Fernandes, N. (2020). Economic effects of coronavirus outbreak (COVID-19) on the world economy. Available at SSRN 3557504. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3557504

[18] Frost, R., Nimmons, D., & Davies, N. (2020). Using remote interventions in promoting the health of frail older persons following the COVID-19 lockdown: challenges and solutions. Journal of the American Medical Directors Association. https://doi.org/10.1016/j.jamda.2020.05.03

[19] Guerrieri, V., Lorenzoni, G., Straub, L., & Werning, I. (2020). Macroeconomic Implications of COVID-19: Can Negative Supply Shocks Cause Demand Shortages? (No. w26918). National Bureau of Economic Research. https://bfi.uchicago.edu/wp-content/uploads/BFI_WP_202035.pdf

[20] Guo, Y. R., Cao, Q. D., Hong, Z. S., Tan, Y. Y., Chen, S. D., Jin, H. J., ... & Yan, Y. (2020). The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak–an update on the status. Military Medical Research, 7(1), 1-10.

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

https://link.springer.com/article/10.1186/s40779-020-00240-0

[21] Hayashi, R., & Matsuda, N. (2020). COVID-19 Impact on Job Postings: Real-Time Assessment Using Bangladesh and Sri Lanka Online Job Portals. http://dx.doi.org/10.22617/BRF200162-2

[22] Heinzelman, J., & Waters, C. (2010). Crowdsourcing crisis information in disaster-affected Haiti. Washington, DC: US Institute of Peace. https://www.files.ethz.ch/isn/121995/SR252%20-%20Crowdsourcing%20Crisis%20Information%20in%20Disaster-Affected%20Haiti.pdf

[23] Hynes, W., Linkov, I., & Trump, B. (2020). A systematic approach to dealing with COVID-19 and future shocks. New Approaches to Economic Challenges (NAEC).https://www.oecd.org/naec/projects/resilience/NAEC_Resilience_and_Covid19.pdf

[24] Jones, N. M., Thompson, R. R., Schetter, C. D., & Silver, R. C. (2017). Distress and rumor exposure on social media during a campus lockdown. Proceedings of the National Academy of Sciences, 114(44), 11663-11668. https://doi.org/10.1073/pnas.1708518114

[25] Király, O., Potenza, M. N., Stein, D. J., King, D. L., Hodgins, D. C., Saunders, J. B., ... & Abbott, M. W. (2020). Preventing problematic internet use during the COVID-19 pandemic: Consensus guidance. Comprehensive Psychiatry, 152180. https://doi.org/10.1016/j.comppsych.2020.152180

[26] Leidner, D. E. (2020). Editorial Reflections: Lockdowns, Slow Downs, and Some Introductions. Journal of the Association for Information Systems, 21(2), 264-267. http://doi.org/10.17705/1jais.00600

[27] Lekfuangfu, W. N., Piyapromdee, S., Porapakkarm, P., & Wasi, N. (2020). On Covid-19: New Implications of Job Task Requirements and Spouse's Occupational Sorting. Available at SSRN 3583954. https://www.cream-migration.org/publ_uploads/CDP_12_20.pdf

[28] Leong, C. M. L., Pan, Shan L., Ractham, P., & Kaewkitipong, L. (2015). ICT-enabled community empowerment in crisis response: Social media in Thailand flooding 2011. Journal of the Association for Information Systems, 16(3), 174-212.

[29] Li, B., Yang, J., Zhao, F., Zhi, L., Wang, X., Liu, L., ... & Zhao, Y. (2020). Prevalence and impact of cardiovascular metabolic diseases on COVID-19 in China. Clinical Research in Cardiology, 1-8. https://www.doi.org/10.1007/s00392-020-01626-9

[30] Malhotra, M. (2020). Learning via Computer-mediated communication During the COVID-19 Lockdown. Tathapi with ISSN 2320-0693 is an UGC CARE Journal, 19(10), 185-189. http://www.tathapi.com/index.php/2320-0693/article/download/502/451

[31] McKibbin, W. J., & Fernando, R. (2020). The global macroeconomic impacts of COVID-19: Seven scenarios. Centre for Applied Microeconomic Impact Analysis (CAMA). https://cama.crawford.anu.edu.au/sites/default/files/publication/cama_crawford_anu_edu_au/2020-03/19_2020_mckibbin_fernando_0.pdf

[32] Meinzen-Dick, R. (2020). Collective action and "social distancing" in COVID-19 responses. Agriculture and Human Values, 1-2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7261346/

[33] More than 3 Million Americans Lost their Jobs Last Week. (2020, March 26). The New York Times. https://www.nytimes.com/interactive/2020/03/26/upshot/coronavirus-millions-unemployment-claims.html

[34] Nagar, S. (2020). Assessing Students' perception toward e-learning and effectiveness of online sessions amid COVID-19 Lockdown Phase in India: An analysis. Tathapi with ISSN 2320-0693 is an UGC CARE Journal, 19(13), 272-291. http://www.tathapi.com/index.php/2320-0693/article/download/600/546

[35] Oe, H., & Weeks, M. (2020). How to Support Vulnerable Citizens during the COVID-19 Lockdown: A Community Initiative from Ubiquitous Network Perspectives. Budapest International Research and Critics Institute (BIRCI-Journal), 3(2), 1369-1377. https://doi.org/10.33258/birci.v3i2.995

[36] Pan, S. L., Cui, M., & Qian, J. (2020). Information resource orchestration during the COVID-19 pandemic: A study of community lockdowns in China. International Journal of Information Management, 54 (2020),102143. https://doi.org/10.1016/j.ijinfomgt.2020.102143

[37] Pan, S. L., Pan, G., & Leidner, D. E. (2012). Crisis response information networks. Journal of the Association for Information Systems, 13(1), 518-555. http://ink.library.smu.edu.sg/cgi/viewcontent.cgi?article=2620&context=soa_research

[38] Radulescu, A., & Cavanagh, K. (2020). Management strategies in a SEIR model of COVID 19 community spread. arXiv preprint. arXiv:2003.11150

[39] Sahu, P. (2020). Closure of universities due to Coronavirus Disease 2019 (COVID-19): impact on education and mental health of students and academic staff. Cureus, 12(4). https://doi.org/10.7759/cureus.7541

[40] Shaw, R., Kim, Y. K., & Hua, J. (2020). Governance, technology and citizen behavior in pandemic: Lessons from COVID-19 in East Asia. Progress in Disaster Science, 6 (2020), 100090. http://dx.doi.org/10.1016/j.pdisas.2020.100090

[41] Shenoy, M. V., Mahendra, M. S., & Vijay, M. N. (2020). COVID 19–Lockdown: Technology Adaption, Teaching, Learning, Students Engagement and Faculty Experience. Mukt Shabd Journal, 9(4), 698-702. http://shabdbooks.com/gallery/78-april2020.pdf

[42] Shojaei, S. F., & Masoumi, R. (2020). The importance of mental health training for

International Journal of Instructional Technology and Educational Studies (IJITES)
ISSN (Print): 2682-3918 - ISSN (online): 2682-3926
Volume3 / Issue3, August 2022
DOI: 10.21608/ihites.2022.113387.1104

psychologists in COVID-19 outbreak. Middle East Journal of Rehabilitation and Health Studies, 7(2). https://doi.org/10.5812/mejrh.102846

[43] Sohrabi, C., Alsafi, Z., O'Neill, N., Khan, M., Kerwan, A., Al-Jabir, A., ... & Agha, R. (2020). World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). International Journal of Surgery. https://doi.org/10.1016/j.ijsu.2020.02.034

[44] TELECOM Review (2020). COVID-19: Consequences and Opportunities for the ICT Sector. https://www.telecomreview.com/index.php/articles/reports-and-coverage/3703-covid-19-consequences-and-opportunities-for-the-ict-sector

[45] Valecha, R., Rao, R., Upadhyaya, S., & Sharman, R. (2019). An activity theory approach to modeling dispatch-mediated emergency response. Journal of the Association for Information Systems, 20(1), 33-57

[46] Van Bavel, J. J., Boggio, P., Capraro, V., Cichocka, A., Cikara, M., Crockett, M., ... & Ellemers, N. (2020). Using social and behavioural science to support COVID-19 pandemic response. https://psyarxiv.com/y38m9/download?format=pdf

[47] World Health Organization. (2020a). Coronavirus disease 2019 (COVID-19) situation report-113 https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200512-covid-19-sitrep-113.pdf?sfvrsn=feac3b6d_2

[48] World Health Organization. (2020b). Practical considerations and recommendations for religious leaders and faith-based communities in the context of COVID-19: interim guidance, 7 April 2020 (No. WHO/2019-nCoV/Religious Leaders/2020.1). World Health Organization. https://apps.who.int/iris/bitstream/handle/10665/331707/WHO-2019-nCoV-Religious_Leaders-2020.1-eng.pdf

[49] World Health Organization. (2020c). Coronavirus disease 2019 (COVID-19): situation report, 72. https://apps.who.int/iris/bitstream/handle/10665/331685/nCoVsitrep01Apr2020-eng.pdf

[50] Wu, C., Chen, X., Cai, Y., Zhou, X., Xu, S., Huang, H., ... & Song, J. (2020). Risk factors associated with acute respiratory distress syndrome and death in patients with coronavirus disease 2019 pneumonia in Wuhan, China. JAMA internal medicine. https://www.doi.org/10.1001/jamainternmed.2020.0994

[51] Wu, Z., & McGoogan, J. M. (2020). Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. Jama. https://jamanetwork.com/journals/jama/fullarticle/2762130/

[52] Yang, Y., Shang, W., & Rao, X. (2020). Facing the COVID‐19 outbreak: What should we know and what could we do?. Journal of Medical Virology. https://onlinelibrary.wiley.com/doi/abs/10.1002/jmv.25720