International Journal of Early Childhood Special Education (INT-JECSE)
DOI:10.9756/INTJECSE/V14I5.837 ISSN: 1308-5581 Vol 14, Issue 05 2022

Impact of online education and its sustainability on Children's education in Rwanda in Covid-19 times

Swapna H. R[1], Bigirimana Emmanuel[2], Geetika Madaan[3], Jyothi Shanbhag[4]
[1]Professor, JAIN (Deemed-to-be University), swapna.hulimavu@gmail.com, Bangalore, India.
[2]Research Assistant, JAIN (Deemed-to-be University), bigiemmanuel21@gmail.com, Rwanda, Africa.
[3]Assistant Professor, University Centre for Research and Development, geetumadaan2009@gmail.com, Chandigarh University, India.
[4]Coordinator and Senior Faculty, JAIN (Deemed-to-be University), jyothishanbhag@gmail.com, Bangalore, India.

Corresponding Author: Dr. Swapna H R,
Email ID: *swapna.hulimavu@gmail.com, Bangalore, Karnataka, India.*

ABSTRACT
The consequences of the COVID-19 on the education sector has shocked all countries around the world. Rwanda is a landlocked developing country in Africa, it is geographically dominated by mountains and lakes and is considered and one of the densely populated countries in Africa with population of over 13million (Wikipedia, 2019). As a developing country, the outbreak of Covid-19 led downturn the economic status of the country. According to the recommendations of WHO to stop the spread of the virus, they were forced to shut down schools, where more than 3 million of students were studying (Daniel, S. J., 2020). In this regards the Republic of Rwanda implemented a new plan by promoting remote teachings to support distance learning conducted through televisions, Radio, YouTube telephones, and other internet platforms. The government started encouraging educational institutions to opt for an e-learning system and, to be familiar with this new technology driven education system for both teachers and students. The major challenge here was electronic devices. This article discusses both, negative and positive aspects of covid-19 on education system, focusing on how the pandemic worsens the quality and sustainability of online education.

Keywords: ***Technology, E-learning, Platforms, sustainability, online education***

INTRODUCTION
The E-learning system is based on a formalized structure that uses electronic means to conduct online classes through distinguished platforms such as google meet, zoom meet, and many others. Different devices such as computers, smartphones, internet forms and iPad are the key components of E-learning. At the beginning of 2020, the whole world faced a dangerous pandemic situation which forced educational institutions to close their door and start using online platforms instead (Ngogi, E. M., 2020).
In March 2020 Rwanda as other countries resulted in the closure of all primary schools, high schools, universities closed to avoid the spread of the virus among students, parents as well the community. Though, the willingness of students to adopt a new technology driven educational system was very challenging specially for practical subjects (Omodan, B. I., 2020). As Rwanda is a developing country it faces many challenges in inadequate access to online resources and due to geographical constraints there was limited internet connectivity (Daniel, S. J., 2020). This article focuses on how Rwandan faced the hurdles in setting up of online education and whether this system gains sustainability.
Teachers started a new teaching strategy with the support of the government and private sectors where they started teaching through radio and television ((Dube, B., 2020). A few platforms were there but limited not used successfully, due to the lack of skills about online learning (e-learning). Even if technology is advancing at a noble level in Rwanda, online resources and devices were not affordable by everyone, especially students from poor and big families had a great challenge (Di Pietro, et.al., 2020).

REVIEW OF LITERATURE
Sahu (2020), in his research study highlighted that the closure of educational institutions started to reduce the spread of covid-19 among students as well as their parents and community, and due to the rise in the number of cases, many

institutions' events such as workshops, conferences, sports and other activities canceled and postponed all campus operations, hence the transition from face-to-face e-learning. During the Covid-19 pandemic outbreak in the education sector, from nursery school to the higher education the implementation of online education using different platforms to continue their operations is a must. The author suggested that universities and other educational institutions should apply various measures to minimize the spread of this virus. The following services such as counseling services, should be available to protect and maintain students' wellbeing and it is the responsibility of all educational authorities.

Warugaba, et al., (2020), in their article, the authors analyzed that the students were unable to download course materials on time due to the poor internet connectivity. Only Lower definition videos can be accessible in those areas with poor connectivity. Massive open online course (MOOC) implementation in Rwanda encountered many barriers, multiple interventions, and obstacles that reduced its potential. There was only limited area in Rwanda where students could access e-learning resources can take such online courses.

Vlachopoulos (2021), discusses that if students and educators have access to the technology and resources, the implementation of online education could be effective. Serious programs carefully ensure the smooth and effective application of e-learning. Poor procurement processes of educational institutions may lead to the lack of enough budget to invest in new online educational technology. And sometimes, government and officials may fail to support both short-term and long-term educational projects. It is a must to have a systematic approach in the financing, designing and delivering of virtual learning, but if they don't, many new systems could harm the education sector in general.

Bailaia and Kvavadze, (2020), speaks about the transition to online education in Georgia, describing about the utilization of different platforms for online education, google meet platform for online education was implemented to help different schools both private and public adapting and continue their operations during the Covid-19 pandemic. Yet, the assignments and exam preparation needed advanced technology for re-arranging assignments and exams to protect students from cheating and plagiarism. Recently, the e-learning system was not used effectively regarding its quality. This pandemic showed that the world should learn from this and be prepared every day to fight against any pandemic, their suggestion is to improve teaching methodologies.

According to World Bank (2020) studies, the students in Indonesia reported that taking online classes must not be a better option due to the lack of facilities and infrastructures in their home areas. Laptops, computers, tablets, and telephones are not easily accessible by everyone. Lack of home learning experience and lack of technological skills for parents was a major challenge especially for assisting their children in primary school.

According t**o** Putri, et al., (2020) many challenges are being experienced by rural students because online learning was not a part of their culture especially those from poor families, lack of e-content is another issue, so teachers were advised to create a new curriculum in connection with online teaching. The researcher also observed that the students were affected to a higher extent because firstly they were focused, some of them were getting addicted to social media or gadgets while taking online classes.

Harerimana, et al., (2016), conducted a study on education for nursing course, more than thousand nurses have been speedily upgraded from A2 to A1 in nursing schools as a result of e-learning. Numerous health workers were not able to advance themselves to another education level without the help of distance learning. After the introduction of e-learning, nurses have access to different pieces of training, innovative programs that enhance their professionalism. The e-learning education for health workers, especially midwives and nurses, is a good example of approaches that the government of Rwanda uses to facilitate and upgrade the skills of nurses and midwives.

UNESCO, (2020), in their article they have mentioned that it is debatable to know how the covid-19 will affect the education operations, whether medium and long-term, but the present impacts are easily recognized. The uniqueness of the situation makes it difficult to predict what will happen in the future as the things are unpredictable. Covid-19 has already increased the studying time due to many lockdowns, and some have no accessibility to study online. Teachers are also affected because their contracts may terminate if the situation continues.

OBJECTIVES

- To determine the extent to which the Rwandan education sector has been shocked by the pandemic.
- To highlight different opinions suggested by respondents to improve the online teaching system and have a sustainable education.
- To evaluate various challenges brought by Covid-19 to education system in developing country like Rwanda.

METHODOLOGY

This study was descriptive and exploratory in nature. The study was carried out from Rwanda, central east Africa, with an estimated population of 13 millions according to United Nations data as on July 4, 2020. The online google

generated form (survey) used to collect data from respondents was shared with high school and university students from Rwanda. Various related data are from some websites, for instance, the ministry of education website and different journals about the impact of covid-19 on education. The aim was to carry out a survey from high school and university students to view their experiences in online education. The sample selected represents the population and, MS-excel software analyzes the collected data by illustrating graphs and tables. SPSS was used for analyzing and interpreting results.

Sampling framework

A simple random sampling technique was used to select the sample for the study. 580 responses were received from high schools (ordinary level, advanced level), universities (under-graduate students). A structured questionnaire was shared randomly with students around the country through online survey form. Later, data collected was analyzed using different statistical tools to indicate and evaluate the extent to which Rwandan education was affected.

RESULTS AND DISCUSSION

A sample of 580 students understudied from different high schools, undergraduate and postgraduate responded to the online study method. All the responses were collected online and were analyzed using MS excel and SPSS. Tables and graphs below interpret the analysis of results from primary data.

Table 1 illustrates the students' preference for two different modes of learning. Taking online classes or Regular classes and some prefer having both, 42.70% of students from different categories of income B, C, D, and E, prefer both online and regular classes. Typically, students can afford online classes according to their family level of income for they have access to devices, 36% from B, 12.50% from C, 5.26% from D, and 0.00% from E; this indicates that those from E income category are not able to attend and many students said that they had difficulty in accessing to devices. 66.67% from the E category wish to continue face-to-face classes. The majority of students prefer studying both online and regular classes, but this would be possible if all access devices equally.

According to table 2, desktops and televisions are less used by students for online studying with only 4% and 12% respectively. Students also use laptops to attend online classes with 29%, where most of them are postgraduate students. 50% of students use radio to attend classes. Tablets also are being used as a way of live streaming. Most students used smartphones to the extent of 58% in total, where 27% are from A' level, 40% in O'level, 68% from postgraduate and 76% from undergraduate.

According to the analysis depicted in graph 1, 94% of students from different educational levels have accept that the pandemic affected their studies.

From graph 2, it clearly depicts that the accessibility of electronic device is very limited because 67% responded that the access is not much and sometimes they can miss classes. 16% of them share devices with others and 17% confirmed that they have their own and access online classes well.

As represented in graph 3, Students said that devices are available to the 54%, but accessibility is not easy and affordability well because they are expensive. The Connectivity of the network is also quite good, and even if devices are accessible, the price of internet bundles are still high for students. Contents are available but affordability and accessibility need more effort.

RECOMMENDATIONS

Here are opinions suggested by the respondents to improve the online teaching system and have a sustainable online education system. The recommendations are categorized for Government, educational institutions, for staff and even for students.

To the Government

Ministry of education must intensively focus on technology development as the only way of reducing Covid-19 challenges to build a future virtual education system. It could be possible to improve, mobilize and support all educational institutions to start having their platforms to conduct online classes. Researchers also must start the academic assessment to see where support is needed most and what could be done by the ministry of education to improving the virtual education system. Instructors should also know the number of students with all requirements and not missing classes. The African Government should consider the Covid-19 pandemic situation as an opportunity to implement tech-driven technology supporting sustainable online education.

- Governments should look for, through financial measures and different motivating forces, to foster an 'empowering climate' and to motivate the private sectors to add to a firm technovative basis for the instruction framework contributing sustainable online education system.
- It could be better if the government improve in progress of giving one laptop to one child for lower income category because this will be helpful and give more opportunities to attend class without any challenges.

- Governments should publish, consult and counsel on crisis executive plans, to guarantee the coherence of education system in such any future emergency too. Ministry of education should give necessary training for teachers in using the tech-tools for online classes.
- Governments ought to focus on the preparation of instructors in the utilization of innovation and in directing exercises on the web.

For Institutions

Working to a plan of sustainable improvement over online education system, (which the respondents exhibited a strong commitment to) progress can become a standard practice. As the 'cutting edge' in education system, the institutions, their management, and their staff members, ought to have authority and empowerment to incorporate innovative tools, where they can show that it works in e-learning system. It is hard to be explicit, as the conditions are exceptionally different.

- Proper and effective training must be given to all teachers/instructors about the use of electronic devices accurately.
- Timely arrangement of recorded explanations of topics and students must be able to access all videos related to their subjects.
- Marinating good relationship between teachers and their students may be comprehensive while conducting online classes, means it would be helpful if their can communicate after classes for the purpose of clarifying students doubts.
- Promoting continuous expert improvement for educators, and empowering peer learning, among educators in their institution.
- Creating plans to raise awareness among society, students, their parents and the community as a whole of the advantages of e-learning and technology helped learning as an extra learning instrument.

General resources for improved e-learning system in Rwanda, that can be taken care by government, institutions or any other sectors under CSR activities.

- ❖ Endowment of free high speed Wi-Fi in rural areas
- ❖ Giving devices and gadgets on credit or affordable price
- ❖ E-library and recorded videos

The Government through ministry of education ought to give psychosocial support to students, instructors, training authorities and different partners and furthermore give data to foresee transmission and spread of Coronavirus in the mediums and procedures that can be student focus.

It is very important to have knowledge on using electronic devices across all students, sometime, a large number of class attendants are not able to attend due to the problem of knowledge. ICT short courses can help before any advanced subject so that everyone can attend.

CONCLUSION

Conclusively, it is vital to adapt ourselves to the new situation. Rwanda's education system struggled a lot during the outbreak of the covid-19 pandemic and was waken up to be always ready for disasters. It is not easy for developing countries with many lower-income earners and developing technology to adopt the new education system. The ministry of education is commended to the standing steady so that essential learning time (calendar) not be wasted due to particular pandemics. Therefore, continuing classes using e-learning must be a topmost priority for the ministry of education to fight against the interruption to the education sector is possibly limited.

Measures to moderate any arising difficulties starting from the laid approaches are additionally basic to guarantee that ministry of education can give admittance to quality, fair and comprehensive education to the students during and after the emergency to guarantee kept learning and to stay up with 100% program.

REFERENCES

Bailaia , G., & Kvavadze, D. (2020). Transition to Online education in Schools during a SARS-CoV2 Coronavirus(Covid-19) Pandemic in Georgia. *Pedagogical Research, 5(4)*. doi:10.29333/pr/7937

Di Pietro, G., Biagi, F., Costa, P., Karpiński, Z., & Mazza, J, (2020). The likely impact of COVID-19 on education: Reflections based on the existing literature and international datasets. Publications Office of the European Union, Luxembourg.

Dube, B. (2020). Rural Online Learning in the Context of COVID-19 in South Africa: Evoking an Inclusive Education Approach. Multidisciplinary Journal of Educational Research, 10(2), 135-157

Harerimana, A., G Mtshali, N., Hewing, H., Maniriho, F., Mukankaka, A., Rukundo, E., . . . Mugarura, J. (2016). E-Learning In Nursing Education In Rwanda: Benefit and Challenges. An Exploration of Participants' Perceptives. *IOSR Journal of Nursing and Health Science(IOSR-JNHS), 5(3),* 64-92.

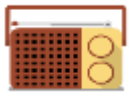
Learning, V. E. (2013). *Education Project in Rwanda Combines Online Classes, Local Help.* Washington DC: VOA English Learning.
Ngogi, E. M., (2020). The Impact of COVID-19 Pandemic on Education: Navigating Forward the Pedagogy of Blended Learning. Department of Education KwaZulu-Natal, South Africa.
Omodan, B. I. (2020). The Vindication of Decoloniality and the Reality of COVID-19 as an Emergency of Unknown in Rural Universities. International Journal of Sociology of Education. 1-26.
Putri, S., Purwanto, A., Pramono, R., Asbari, M., Wijayanti, L. M., & Hyun, C. C. (2020). Impact of COVID-19 Pandemic on Online Home learning. *International Journal of Advanced Science and Technology, 29(5)*, 4089-4818.
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)*.
UNESCO. (2020). COVID-19 and higher education: Today and tomorrow.
Vlachopoulos, D. (2021). Covid-19:The threat or opportunity for online education? *Higher learning Research Communication, 10(1)*, 16-19. doi:10,18870/hlrc.v10i1179
Warugaba, C., Naughton, B., Gauthier, B. H., Muhirwa, E., & Amoroso, C. L. (2020). Experience with a Massive Open Online Course in Rural Rwanda. *International Review of Research in Open and Distributed Learning*(17(2)), 222-231
World Bank. (2020). Remote learning and COVID-19. The use of educational technologies at scale across an education system as a result of massive school closings in response to the COVID-19 pandemic to enable distance education and online learning. Revised draft 16 March 2020.

Tables and Graphs

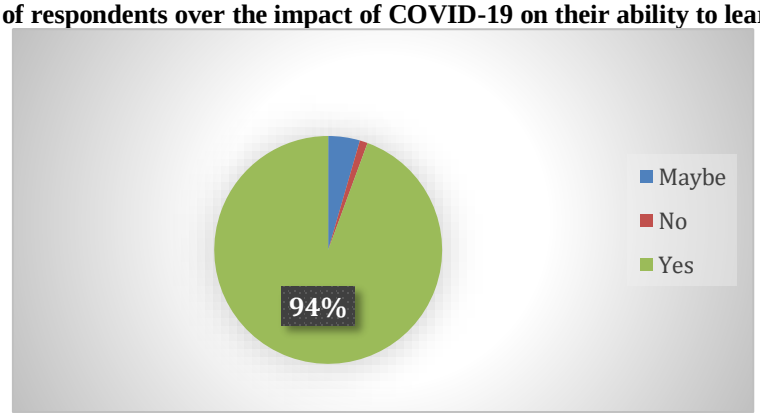
Table 1: Indicates the students' preferences between virtual learning and face-to-face classes

	CATEGORIES/UBUDEHE				
Preferences	**B**	**C**	**D**	**E**	**Grand Total**
Both	%	54.17%	42.11%	33.33%	42.70%
Online classes	%	12.50%	5.26%	0.00%	15.73%
Regular classes	%	33.33%	52.63%	66.67%	41.57%

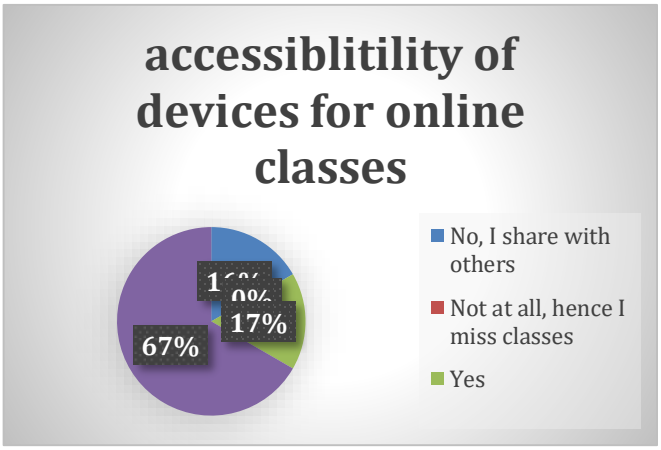
Table 2: What advice do you use for distance learning?

						
Education Levels	**Desktop**	**Laptop**	**Radio**	**Smartphone**	**Tablet**	**Television**
A 'level(Secondary)	0%	24%	0%	27%	0%	8%
O' level(Secondary)	0%	0%	50%	40%	0%	10%
Post-graduate	0%	73%	0%	68%	0%	0%
undergraduate	4%	14%	0%	76%	5%	0%

Graph 1: Perception of respondents over the impact of COVID-19 on their ability to learn/study negatively?



Graph 2: Accessibility to a device for learning online?



Graph 3: Respondents perception over the biggest challenge with regard to using e-learning effectively, (based on availability and affordability).