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**THE IMPACT OF COVID-19 PANDEMIC ON THE EDUCATION SYSTEM IN
DEVELOPING COUNTRIES**

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The Impact of COVID-19 Pandemic on the Education System in Developing Countries



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Abstract

Purpose: The purpose of this study is to investigate the impact of COVID-19 on the education systems in developing countries.

Methodology: The study adopted a desktop methodology. Desk research refers to secondary data or that which can be collected without fieldwork. Desk research is basically involved in collecting data from existing resources hence it is often considered a low cost technique as compared to field research, as the main cost is involved in executive's time, telephone charges and directories. Thus, the study relied on already published studies, reports and statistics. This secondary data was easily accessed through the online journals and library.

Findings: The findings of the study revealed the existence of a contextual and methodological gap relating to the impact of COVID-19 on the education systems in developing countries. Preliminary empirical review found that in the world, most schools, colleges, and universities are closed to control the spread of the COVID-19.

Unique Contribution to Theory, Practice and Policy: The Disruption theory, Social Learning theory and the Cognitive Load theory may be used to anchor future studies on the impact of COVID-19 on education systems in developing countries. The COVID-19 pandemic has made all the educational schools across the world to adopt teaching and learning online. So, governments should scale network infrastructure and internet connectivity across urban and rural areas. The countries should design a strategy to scale educational technology, establish zero-rating educational resources on the internet, and prepare digital teaching and learning resources.

Keywords: *Coronavirus, Developing Country, Distance Learning, Education System, Impacts of COVID-19.*

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INTRODUCTION

The coronavirus (COVID-19) is a pandemic virus that has a significant impact on educational systems worldwide (Tadesse & Muluye 2020). The global education system has been affected by the coronavirus pandemic outbreak, as recognized by UNESCO (the United Nations Educational, Scientific, and Cultural Organization) (UNESCO, 2020b). Many of pandemics have happened throughout human history, and each one has had some effect on things like human life expectancy, educational opportunities, and global prosperity (Editors, 2020). After spreading to 114 nations in 3 months and infecting more than 118,000 people worldwide, the World Health Organization (WHO) (WHO, 2020a) declared on March 11, 2020 that coronavirus (COVID-19) is a pandemic.

On December 31st, 2019, the Wuhan Municipal Health Commission in Hubei Province, China, reported the first case of COVID-19 (WHO, 2020b). The global coronavirus epidemic has quickly spread and already affects 213 territories and countries. Worldwide, there were approximately 30,086,319 cases, 21,833,645 recoveries, and 945,962 fatalities as of September 17, 2020. (Worldometer, 2020). (Medical News Today, 2020) reports that scientists are worried about the rapid spread of coronavirus, leading many nations to close their schools and impose severe quarantine measures on their citizens in an effort to halt the tide of the sickness. Governments are concentrating on supplying necessary items, establishing medical facilities and laboratory centers, locating the virus, identifying it, naming it, and educating the public, and training health personnel (Atif & Malik. 2020). Education has been the backbone of every nation's progress, making it crucial to every nation's eventual success. Many obstacles, such as curricular shifts and school closures caused by pandemics, have had an impact on the educational system (Owusu-Fordjour *et al.*, 2020).

87 percent of the world's student population is impacted by the COVID-19 school closures, according to UNESCO (UNESCO, 2020b). UNESCO is implementing new methods of online education in an effort to reach at-risk youth. Almost 1.5 billion pupils in 195 countries have had school cancelled due to the COVID-19 epidemic, as reported by the UNESCO. COVID-19 had far-reaching effects on not only the economy and our daily lives, but also on our mental, emotional, and physical health, as well as on the celebration of cultural and festive events, stress among the population, the closure of hotels, restaurants, religious and entertainment venues, and losses in national and international business, poor cash flow in the market, and locked national and international travel (Onyeaka *et al.*, 2021)

Then came the economic shock, as governments in many developing nations slammed the brakes on their economies in an effort to slow the spread of disease. Because of this, developing nations have seen the steepest economic downturn and widest-ranging shutdowns of their educational and transportation infrastructure in history (Okubo, 2020). The platforms, educational applications, and resources that make up distance learning solutions are made with the intention of assisting educators, parents, and students. Learning management systems (LMSs), massive open online course (MOOC) platforms, and digitally delivered, independently studied materials (DLCs (UNESCO, 2020a). However, distance learning presents challenges for educators, students, and families in developing countries due to a lack of internet connectivity, IT, educational materials,

and digital technology skills (Ferri *et al.*, 2020). Radio, television, and the internet are used in some poor countries to teach students.

Yet the poorest households and students lack the means to access the resources and study at home, such as radios, televisions, and computers. As a result, the poorest students in some developing nations receive aid in the form of textbooks, radios, tools, and educational guides (Belay, 2020). This research reviewed and discussed articles about the effects of coronavirus on schools, the effects of COVID-19 on children, students, teachers, and parents, and recommendations for maintaining classes during the outbreak. It also addressed the difficulties and potential benefits of distance education and online education, as well as the state of the education system following the coronavirus.

To stem the global spread of the COVID-19 pandemic, most nations have temporarily shut down daycares, nurseries, elementary and secondary schools, and postsecondary institutions (TUAC Secretariat Briefing, 2020). Teachers and parents all over the world are also affected by the COVID-19 outbreak. There are more than 1.5 billion students in 195 countries who are not in school because of the school closures, according to a UNESCO report (UNESCO, 2020b). According to (Pujari, 2020), COVID-19 will have far-reaching consequences for the entire educational system, including tests and evaluations, the beginning of a new semester or term, and possibly even the length of the school year.

The worldwide spread of COVID-19 has presented a challenge to the field of education. In (Crawford *et al.*, 2020), the authors discuss and analyze the intra-period responses of 20 countries' higher education systems. They came to the conclusion that the implementation of socially isolating strategies in higher education necessitates a hasty retooling of curricula for entirely virtual classrooms. Children, educators, and parents in India are having trouble because of the school shutdown (Selvaraj, 2021). As a better solution that is also feasible and appropriate, online education presents a challenge for low-income families and students. UNESCO claims that nine out of ten students around the world have had to miss in-person classes due to the COVID-19 pandemic.

There are no schools open anywhere in the world today, and over 1.5 billion children and young adults (from kindergarten through college) are affected. The percentage of students without home computer and internet access is 43% (706 million) out of the total global student population of 50% (826 million). In addition, mobile phone coverage issues prevent about 56 million students from using their devices. In the 216 million schools across the 21 countries that make up Sub-Saharan Africa, 82% of students do not have computers, 82% do not have home internet access, and 11% do not have access to mobile networks. In addition, there are roughly 56 million students in Sub-Saharan Africa who do not have access to mobile networks. The pandemic also highlights the need for more teachers with expertise in ICT. As many as 60 students are waiting for each qualified teacher in developing countries' primary schools (UNESCO, 2020b; O'Hagan, 2020). In developing countries, maintaining a regular school schedule during the current COVID-19 pandemic poses significant challenges.

Governments in countries with varying levels of economic development use a variety of distance learning approaches to keep the educational pipeline open when schools are closed (Avanesian *et al.*, 2021). About 90% of high-income countries use online delivery, with another 20% using a hybrid of broadcast and online delivery. In the upper-middle-income countries, more than 70 percent of the educational opportunities are a hybrid of broadcast and online. Further, roughly 66% of the lower-middle income countries offer some form of broadcast and/or online education. In low-income countries, television and radio are used in education less than 25% of the time. Most countries in Europe, Central Asia, East Asia, the Pacific, the Caribbean, and Latin America use some form of distance learning, either entirely online learning or a hybrid of broadcast and online learning, to reach and educate their rural student populations. About 28% of countries in North and Middle East Africa rely solely on radio and television for education, less than 40% rely solely on online learning, and 22% rely on both. Forty percent of South Asian countries use broadcast education, and another fifty percent use a combination of broadcast and online education. Only 11% of the countries in Sub-Saharan Africa are relying solely on online education, while 23% use both broadcast and online methods (Wodon, 2020).

Unfortunately, most students in low- and middle-income countries cannot access the educational opportunities provided by broadcast and online learning (Jordan *et al.*, 2021). Governments should invest in their teachers by providing them with training in technology-based education during the COVID-19 crisis. Half of the countries in South Asia offer support to educators in the form of training and guidance. Over half of the schools in Europe, Central Asia, North, and Middle East Africa, as well as those in the Caribbean and Latin America, and 40% of those in the Pacific and East Asia, invest in teacher education. Unfortunately, educators in Sub-Saharan African countries do not receive adequate preparation (Vegas, 2020). Finally, the report indicates that the pandemic will have a significant effect on the global education system. Particularly impacted and less able to provide distance learning and training to teachers is the education system in low-income countries (Lorente *et al.*, 2020).

While schools are closed, a collaborative effort is under way between researchers, curriculum designers, education officers, and educational institutions to revamp the educational system. Curriculum development, post-COVID-19 learning strategy and technique preparation, and system-wide educational reform are all responsibilities of the educational community. It is important to use this time to improve the educational system by working on things like curriculum development, collaboration, skill building, and the establishment of new educational institutions. Children will return to school when it reopens after the COVID-19 pandemic because of the school's planning for students, parents, and teachers to make up for time missed, as well as the school's efforts to increase the availability of distance learning (Dawadi *et al.*, 2020). Teachers and school administrators should work together to inform parents and students of the importance of keeping children safe at home during school closures while also encouraging them to continue learning and reading as much as possible (Tiruneh, 2020).

Disparities exist between students who grew up in cities and those who did not, between those whose parents had a high level of education and those who did not. Therefore, when schools

reopen, the education system should develop and implement some actions supported by evidence that aim to facilitate the recovery of the lost percentage. Due to the lack of necessary support during the school closures, it may take children of low-income and illiterate parents a very long time to make up for the time they lost. Students from low-income families may have to choose between staying home and helping out at home by working as day laborers during school breaks. Parents in rural areas may be hesitant to send their kids back to school if they feel their kids would be better off helping out on the family farm or herd cattle (Mahmud, 2021).

Schools should keep tabs on absent students and devise plans to reassure worried parents into sending their kids back to class, even if the countries have recovered from the COVID-19 pandemic (Tiruneh, 2020). Strategies for preparing educators and students to respond efficiently and effectively during and after COVID-19 are needed in the educational system. Face-to-face classes aren't necessarily the best setting for either teaching or learning. When the COVID-19 pandemic is over, it will be essential that students have been taught to think critically and act swiftly in a crisis, using a variety of learning strategies. As such, it may be necessary for the international community to lend a hand to developing-world educational systems in their quest to future-proof their institutions, staff, students, and families (Pokhrel & Chhetri, 2021).

Statement of the Problem

The COVID-19 pandemic has had a big effect on education systems all over the world, but it has been especially bad in developing countries. Most of the time, these countries don't have the money, infrastructure, or technology to support remote and hybrid learning. This means that millions of students don't have access to a good education (Onyema *et al.*, 2020). The pandemic has made problems like poverty, inequality, and lack of access to health care and education even worse than they were before. This could have long-term effects on the economic and social growth of these countries. By giving a full picture of how COVID-19 affected education in developing countries, this study will help shape policy and practice and lead to the creation of sustainable and fair education systems in the time after the pandemic. Given the urgent need to address the impact of COVID-19 on education in developing countries, this study aims to investigate the impact of COVID-19 on the education systems in developing countries.

LITERATURE REVIEW

Theoretical Review

Disruption Theory

Clayton M. Christensen first proposed the concept of disruption in his 1997 book. That's one explanation for how the COVID-19 pandemic might affect classroom instruction. Schools, this argument posits, have been forced to rapidly adopt online and hybrid learning due to the pandemic's disruption of the traditional model (Floris *et al.*, 2020).

Schools were forced to implement a rapid transition to online education after the cancellation of in-person sessions. Due to this unexpected development, there is now a greater demand for creativity and adaptability in the classroom. To keep up with students' needs, schools and teachers

had to quickly adopt new approaches to teaching and learning. This change has hastened the spread of tech-based classrooms and may have far-reaching consequences for the future of education (Crawford, 2020).

The pandemic has also brought attention to educational disparities. The achievement gap may worsen if some students cannot participate in remote learning because they lack access to the technology and resources needed to do so. According to the ideas put out by the Disruption Theory, this epidemic has prompted schools and teachers to get creative in their approaches to addressing these problems and meeting the requirements of their students. According to proponents of the Disruption Theory, the urgency of the need for novel and adaptable pedagogical strategies has been amplified by the pandemic. There have been certain difficulties associated with the transition to online and hybrid learning, but there have also been possibilities for educators and institutions to reevaluate and build upon tried and true practices (Dhawan, 2020).

Social Learning Theory

Social Learning Theory is another theory by Albert Bandura that attempts to explain the impact of COVID-19 on education. This theory says that COVID-19 has made it harder for people to talk to each other and work together in classrooms, which has hurt learning and student engagement (Gopinathan *et al.*, 2022). In traditional classrooms, students learn not only from the teacher but also from each other. Students talk to each other, share ideas, ask questions, and work together on projects in groups. But with the rise of remote and hybrid learning, many of these chances to meet new people have gone away. Because of this, students may feel alone and not interested in learning.

Social learning theory says that interacting with other people is important for learning. Students and teachers may be less motivated, engaged, and successful in school if they don't see each other in person. Students may also miss out on the emotional and social support that comes from being a part of a classroom community. Also, the move to online learning may affect the quality of teaching as well. Without being able to talk to their students in person, teachers may find it harder to create a dynamic and interesting learning environment. They may also find it hard to help each student individually, which can make students even less interested (Aguilera-Hermida, 2020)

In a nutshell, Social Learning Theory says that the pandemic has changed the social parts of learning and made things harder for both students and teachers. To solve these problems, we will need to come up with new ideas that encourage social interaction and teamwork in online and hybrid learning environments.

Cognitive Load Theory

Cognitive Load Theory coined in 1988 by John Sweller, attempts to explain the impact of COVID-19 on education. This theory says that the pandemic may cause more stress and anxiety, which could make it harder for students to learn and remember things. The COVID-19 pandemic has caused a lot of chaos and uncertainty, which has made many students feel more stressed and anxious. This extra mental work may make it harder for students to concentrate on their studies, which could hurt their grades (Zhao & Hu, 2021).

In addition to the emotional effects of the pandemic, the move to remote and hybrid learning may also add to the amount of mental work that students have to do. For example, students may have to learn how to use new technology, keep track of their own time and schedule, and figure out how to learn in a more independent setting. These extra demands on cognitive resources may make learning even less effective (Singh & Singh, 2021). Cognitive Load Theory says that teachers need to be aware of how much more their students have to think about during the pandemic in order to help them learn the most they can. Teachers can help students manage their mental load by giving clear and concise instructions, breaking down complex tasks into smaller parts, and limiting distractions.

Cognitive Load Theory says that the pandemic has made students' minds work harder, making it harder for them to learn and remember things. To deal with these problems, teachers will need to be aware of the extra mental demands placed on students and give them the help they need to handle their mental load well.

Empirical Review

Abumalloh (2021) conducted a study on the impact of coronavirus pandemic (COVID- 19) on education: the role of virtual and remote laboratories in education. This study looks at the expected benefits of e-learning during the COVID-19 pandemic. A survey of students at Imam Abdulrahman Bin Faisal University was used to create a new way to look into this issue. On 179 responses that could be used, Partial Least Squares Structural Equation Modeling (PLS-SEM) was used. This study used Push-Pull-Mooring theory to look at how push, pull, and mooring variables affect learners' decisions to switch to virtual and remote educational laboratories. The results showed that the push factor (a threat from the environment) is strongly linked to perceived benefits. The pull factors (motivation for e-learning, perception that information is shared, and social distance) have a big effect on the benefits for learners.

Macharia (2021) sought to investigate the factors influencing education during the COVID 19 pandemic: a case of primary schools in Kajiado County. Kenya reported the first case of COVID-19 on March 13, 2020. As a way to stop the spread of this virus, the government of Kenya closed public places for a short time. To make sure that education didn't stop, the Ministry of Education encouraged people to use remote learning. But there were many problems with putting remote learning into place. This study looked at important factors that affected education in Kenya during the COVID-19 pandemic. The research was done using a descriptive survey research design. The main audience was first graders in Kajiado County. Both teachers and students took part in the study. Data was gathered with the help of questionnaires, and descriptive analysis was used. Based on the analysis, ICT infrastructure, digital skills, and money problems had a big effect on education in Kenyan primary schools and hurt the students who didn't have them.

Wambua (2021) also aimed to analyze the human rights dimension of a pandemic: an evaluation of the effect of COVID 19 on the right to education. For this study, the Classical Liberal Theory of Equal Opportunities, which was put forward by John Locke in 1688, was used to figure out what was going on. This study used both qualitative and quantitative methods to collect data, which

is called a "mixed-method design." The quantitative data were analyzed with Statistical Package for Social Sciences Version 21, and the qualitative data were analyzed with content analysis. The study's results showed that the Covid-19 pandemic could make it harder for people to go to school. Most of the problems caused by the COVID-19 pandemic have made it harder for children to go to school, which is their constitutional right in Kenya.

Pietro (2020) looked into the likely impact of COVID 19 on education: reflection based on the existing literature and recent international datasets. Most countries around the world have decided to temporarily close schools in order to stop the spread of COVID-19. This report looks at existing research and recent international data (from Eurostat, PISA, ICILS, PIRLS, and TALIS) to try to figure out how the COVID-19 crisis may affect how students learn. It looks at the direct and indirect ways that the virus and the steps taken to stop it may affect how well children do in school. Estimates that are "conservative" for a few EU countries always show that, on average, students will lose knowledge. Some people also think that COVID-19 won't affect all students the same way, will hurt the development of both cognitive and non-cognitive skills, and could have important long-term effects on top of the short-term ones.

Shibuko (2022) similarly conducted a study on the effects of COVID 19 related school closures on pupils' academic performance in public primary schools in Vihiga County, Kenya. The goal of this study was to find out how well children in public primary schools in Vihiga do in school. The study used a descriptive survey design, and 145 people, including head teachers, class 8 teachers, class 8 students, and officials from the Sub County MoE, were given Likert-scale questionnaires. The people who took part in the study were chosen at random, and the data was analyzed with SPSS 23. According to the research, it was hard for students to learn well at home. It was found that the pandemic put students' educations at risk because many of them didn't have the skills to study on their own. The studies found that the COVID-19 pandemic had a big effect on how well students did in school, especially those who went to public primary schools in rural or low-income areas. At the same time, specific steps were found that could lessen these negative effects. Because of school closures, most students have been out of school for more than half of a typical school year. Given how much school-based instructional time has been lost since schools have reopened, it is important to find out how much learning has been lost and take steps to fix it. If we don't, we could end up with medium- and long-term educational problems.

Fordjour (2020) conducted a study on the impact of COVID-19 on learning: the perspective of the Ghanaian student. The study used a descriptive survey design, and 214 people, mostly students in Ghana's second cycle and tertiary institutions, filled out questionnaires with 11 Likert-scale questions. The people who took part in the study were chosen by a simple random sampling method. The study showed some of the problems that students face when schools are closed because of the pandemic. Covid-19: Students can't study well from home, which makes the online learning system very ineffective. Again, parents can't help their kids figure out how to use an online learning platform, and they can't fully supervise their kids' learning at home without any problems. It turned out that the pandemic has hurt their learning because many of them aren't used to being able to learn well on their own. Most Ghanaian students have limited access to the internet and

don't know how to use most of these technological devices. This makes it hard for them to use the new e-learning platforms.

METHODOLOGY

The study adopted a desktop methodology. Desk research refers to secondary data or that which can be collected without fieldwork. Desk research is basically involved in collecting data from existing resources hence it is often considered a low cost technique as compared to field research, as the main cost is involved in executive's time, telephone charges and directories. Thus, the study relied on already published studies, reports and statistics. This secondary data was easily accessed through the online journals and library.

FINDINGS

Our study came down to two knowledge gaps, that is the contextual gap and the methodological gaps. A contextual gap presents itself when desired research findings provide a different perspective on the topic of discussion. For instance, Shibuko (2022) similarly conducted a study on the effects of COVID 19 related school closures on pupils' academic performance in public primary schools in Vihiga County, Kenya. The research used a descriptive survey design. The research revealed that it was difficult for the students to learn well at home. It was found that the pandemic had endangered students' education since many of them lacked the necessary skills for self-directed study. The studies established that the emergence of COVID-19 pandemic had a significant detrimental impact on learners' academic performance, particularly those who attend public primary schools in rural and low-income areas. On the other hand, our current study focuses on the impact of COVID-19 pandemic on the education systems in developing countries.

Secondly, this study also presented a methodological gap, that is, for instance, Shibuko (2022) adopted the descriptive research design in his study on the effects of COVID 19 related school closures on pupils' academic performance in public primary schools in Vihiga County, Kenya; whereas our current study adopted desk study literature review methodology.

CONCLUSION AND RECOMMENDATIONS

The COVID-19 virus is a global epidemic that threatens the academic infrastructure of both developing and developed nations. Any nation's future rests on the shoulders of its educated citizens. The majority of the world's schools and institutions have been shut down in an effort to stem the spread of the COVID-19 virus. Students, parents, and educators are all negatively impacted by the school's closing. Hence, online courses provide a means of keeping the educational process moving forward. However, in underdeveloped nations, distant learning is difficult due to a lack of ICT infrastructures, computers, radio, and television, as well as the fact that many parents have never received a formal education. These problems exacerbate inequality since they disproportionately affect the poor and the technologically illiterate, whose families tend to have children with lower educational levels and less positive attitudes toward learning. In many rural places, kids still in school may have to herd cattle and cultivate to make ends meet.

Due to the global spread of the COVID-19 pandemic, all schools have been forced to switch to online instruction. Thus, governments should increase investment in internet and network infrastructure in both urban and rural areas. The countries need to develop a plan to increase access to educational technology, implement internet-free educational content, create digital teaching and learning materials, make use of open educational resources, implement mobile learning and televised instruction, and improve their information and communication technology (ICT) infrastructures. Closed periods are times when researchers, curriculum designers, education officers, and educational institutions collaborate to improve the educational system. In order to adapt to the post-COVID-19 era, educational institutions must redesign curricula, develop new teaching methods, and revamp the educational system. Schools and institutions develop plans after COVID-19 to make up for lost work, get students back into the classroom when they reopen, and expand their virtual education offerings. Last but not least, the COVID-19 pandemic has been affecting the traditional classrooms in underdeveloped nations. Thus, it is important for developing nations to expand their capacities in online education.

REFERENCES

- Abumalloh, R. A., Asadi, S., Nilashi, M., Minaei-Bidgoli, B., Nayer, F. K., Samad, S., ... & Ibrahim, O. (2021). The impact of coronavirus pandemic (COVID-19) on education: The role of virtual and remote laboratories in education. *Technology in Society*, 67, 101728.
- Aguilera-Hermida, A. P. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International journal of educational research open*, 1, 100011.
- Atif, M., & Malik, I. (2020). Why is Pakistan vulnerable to COVID-19 associated morbidity and mortality? A scoping review. *The International journal of health planning and management*, 35(5), 1041-1054.
- Avanesian, G., Mizunoya, S., & Amaro, D. (2021). How many students could continue learning during COVID-19-caused school closures? Introducing a new reachability indicator for measuring equity of remote learning. *International Journal of Educational Development*, 84, 102421.
- Belay, D. G. (2020). COVID-19, Distance Learning and Educational Inequality in Rural Ethiopia. *Pedagogical research*, 5(4).
- Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., ... & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, 3(1), 1-20.
- Dawadi, S., Giri, R. A., & Simkhada, P. (2020). Impact of COVID-19 on the Education Sector in Nepal: Challenges and Coping Strategies. *Online Submission*.
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of educational technology systems*, 49(1), 5-22.
- 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 recent international datasets* (Vol. 30275). Luxembourg: Publications Office of the European Union.
- Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies*, 10(4), 86.
- Floris, F., Genovese, A., Marchisio, M., Roman, F., & Sacchet, M. (2020, January). Teacher support in COVID-19 pandemic to develop blended learning disruptive models in Higher Education. In *17th International Conference on Cognition and Exploratory Learning in Digital Age (CELDA2020)* (pp. 173-180).
- Gopinathan, S., Kaur, A. H., Veeraya, S., & Raman, M. (2022). The role of digital collaboration in student engagement towards enhancing student participation during COVID-19. *Sustainability*, 14(11), 6844.

- Jordan, K., David, R., Phillips, T., & Pellini, A. (2021). Education during the COVID-19: crisis Opportunities and constraints of using EdTech in low-income countries. *Revista de Educación a Distancia (RED)*, 21(65).
- Lorente, L. M. L., Arrabal, A. A., & Pulido-Montes, C. (2020). The right to education and ict during covid-19: An international perspective. *Sustainability*, 12(21), 9091.
- Macharia, I. W. (2021). *Factors Influencing Education During the Covid-19 Pandemic, a Case of Primary Schools in Kajiado County* (Doctoral dissertation, University of Nairobi).
- Mahmud, R. (2021). Family socioeconomic determinants and students' demand for private supplementary tutoring in English in urban and rural Bangladesh. *Education and Urban Society*, 53(7), 831-851.
- Okubo, T. (2020). Spread of COVID-19 and telework: Evidence from Japan. *Covid Economics*, 32, 1-25.
- Onyeaka, H., Anumudu, C. K., Al-Sharif, Z. T., Egele-Godswill, E., & Mbaegbu, P. (2021). COVID-19 pandemic: A review of the global lockdown and its far-reaching effects. *Science progress*, 104(2), 00368504211019854.
- Onyema, E. M., Eucheria, N. C., Obafemi, F. A., Sen, S., Atonye, F. G., Sharma, A., & Alsayed, A. O. (2020). Impact of Coronavirus pandemic on education. *Journal of Education and Practice*, 11(13), 108-121.
- Owusu-Fordjour, C., Koomson, C. K., & Hanson, D. (2020). The impact of Covid-19 on learning- the perspective of the Ghanaian student. *European Journal of Education Studies*.
- Pokhrel, S., & Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. *Higher education for the future*, 8(1), 133-141.
- Selvaraj, A., Radhin, V., Nithin, K. A., Benson, N., & Mathew, A. J. (2021). Effect of pandemic based online education on teaching and learning system. *International Journal of Educational Development*, 85, 102444.
- Shibuko, K. C. (2022). *Effects of Covid-19-related School Closures on Pupils' Academic Performance in Public Primary Schools in Vihiga Subcounty, Vihiga County, Kenya* (Doctoral dissertation, University of Nairobi).
- Singh, J., Steele, K., & Singh, L. (2021). Combining the best of online and face-to-face learning: Hybrid and blended learning approach for COVID-19, post vaccine, & post-pandemic world. *Journal of Educational Technology Systems*, 50(2), 140-171.
- Tadesse, S., & Muluye, W. (2020). The impact of COVID-19 pandemic on education system in developing countries: a review. *Open Journal of Social Sciences*, 8(10), 159-170.
- Tiruneh, D. T. (2020). COVID-19 school closures may further widen the inequality gaps between the advantaged and the disadvantaged in Ethiopia. *Education in Emergencies, April*.

- Wambua, D. (2021). *Human Rights Dimension of a Pandemic: Evaluation of the Effect of Covid 19 on the Right to Education in Kenya* (Doctoral dissertation, University of Nairobi).
- Wodon, Q. (2020). COVID-19 crisis, impacts on catholic schools, and potential responses| part II: developing countries with focus on sub-Saharan Africa. *Journal of Catholic Education*, 23(1), 51-86.
- Zhao, C., & Hu, Y. (2021). Reflections on study strategy modifications using cognitive load theory and dual processing theory in the first year of medical school. *Medical Science Educator*, 31, 813-818.