COVID-19 Effects on Curriculum Delivery in Secondary Schools in Kakamega County, Kenya

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Abstract:

COVID-19 was declared a pandemic by the World Health organization (WHO) on 11th March 2020. Therefore, being declared a global emergency, had undergone various mutations, therefore its effect on education was far reaching. The purpose of the study was to establish the COVID-19 effects on curriculum delivery in secondary schools in Kakamega county. This study was guided by the theory of planned behaviour postulated by Ajzen. The study employed a descriptive survey research design whereby mixed research method was utilized to collect both qualitative and quantitative data. The study targeted public secondary schools in Kakamega County, Kenya, whereby one hundred and ninety-five (195) school principals and one thousand five hundred and ninety (1590) teachers were the targeted population. The study applied stratified sampling in obtaining the 59 secondary schools thus, 59 principals and 159 teachers. The study employed stratified random sampling to put schools in strata that is 15 boy public secondary schools, 15 girls public secondary schools and 29 mixed public secondary schools totaling up to 59 public secondary schools. Purposive sampling technique was used to select school principals since they belonged to public secondary schools in the strata, which provided the required information for the objectives of the study. Data was collected using questionnaire for teachers. Interview schedules was also used to collect data from the school principals. Research instruments were availed to supervisors who ascertained the relevance of the items hence validity of the instruments. Data was analyzed using both descriptive and inferential statistics. Qualitative data was coded and analyzed thematically. Quantitative analysis involved use of frequencies, percentages, means, standard deviation, Spearman correlation analysis and regression analysis. The collected data was presented using pie-charts, frequency tables and mean tables. The study concluded that COVID-19 had adverse effects on curriculum delivery.

Keywords: *Covid-19 Effects, Curriculum, Delivery, Schools.*

Introduction

Curriculum delivery refers to how the curriculum helps students achieve their learning objectives. Curriculum delivery is accomplished through the use of instructional materials, teaching methods, and collaborative learning. Teachers have a significant impact on curriculum delivery. The mode of instruction

and resources used determine the success of curriculum delivery and the achievement of learners (Stabback, 2016). The quality of instructional materials determines the effectiveness of curriculum delivery (Ko and Sammons, 2014). The mode of instruction used is heavily influenced by the instructional materials chosen. Furthermore, school leadership influences the effectiveness of curriculum delivery and the quality of instructional materials used in classrooms (Ko and Sammons, 2014).

According to Cahapay (2020), Educational systems are likewise preparing for the COVID – 19era characterized by "new normal." This expression first emerged in the field of business. It was used to caution the beliefs of economists that industrial economies would revert to normal after the recession (El – Erian, 2010). The term has since been used in different contexts to mean that something which was previously not typical has become typical. It substitutes the accepted habitual, usual state after a certain event happened. (Platinos and Shinis, 2020). In educational dimension, there has been expansive researches discussing the adoption of online modality in instructional implementation in the new normal COVID -19 era (Mulenga and Marbian, 2020, Sintma, 2020, Naciri et al, 2020). Researchers and international organizations have studied the effects of school closures on students' learning and found a measurable loss in the acquisition of basic skills, particularly for the most disadvantaged children (Quinn et al. 2016; Cattaneo et al. 2017). It is on this line that the current study will establish COVID-19 pandemic and its dramatic long-term effects on education system in secondary schools.

Before the COVID-19 pandemic, in-school learning had already been proven to be more effective than distance learning. Furthermore, student outcomes resulting from online learning have been shown to be poorer, on average, than outcomes resulting from face-to-face instruction (Heppen et al. 2017). Conditions for effective remote learning such as, good internet connection, and clear explanations, scaffolding and feedback from teachers are not easy to accomplish. The combination of a digital gap

with teacher inexperience in providing high-quality distance learning makes it difficult to improve students' learning opportunities. Moreover, there is now a significant risk that vulnerable students have less access to quality teaching than their peers, widening the attainment gap due to the school lockdown (Coe et al., 2020).

These emerging discussions as regards education in the new normal COVID -19era could be reconsidered through the lanes of curriculum delivery. Mboi and Nyambedha (2013) discovered that 97.2 % of the students like therapeutic showing since it finishes syllabus and modify for examinations. Further, Yung and Bray (2016) in Hong Kong noted that educators were sure about remedial instruction for it helped them to distinguish requirements of individual students during the extra time. Considering the approaching new normal COVID -19 periods, a rethinking of education within the curriculum delivery perspectives is important. The curriculum delivery should be considered in term of elements such as goal, content, approach and evaluation; as these will enable educators to be clearly informed of the key challenges, decisions and solutions that must be contently considered as the new era is being approached.

As COVID -19 brings forth various restrictions, a new normal curriculum may also adopt the integration of content. Terrence, Kerry, Neville and Ron (2012) noted that a rich lesson is best delivered through a wide range of teaching and learning activities, with utilization of all the key learning areas. This approach geared towards reducing the number of hours spent in all the subjects, but still addressing all the curriculum expectations. This strategy enabled the assimilation of curriculum content expectations from various subjects in designing an instruction (Romano et al., 2012). It was upon this argument, that the current study intended to establish COVID-19 protocols on curriculum delivery in the most squeezed school calendar in the education system in Kakamega County, Kenya.

Besides integrating the content, some educational systems also were contemplating to reduce the curriculum content. Furthermore, many educational systems were contemplating responsive approaches to implement the curriculum (Cahapay, 2020). Most of them were focusing on the role of technology. During an era of social distancing practice demonstrating a major new normal behavior, many schools were geared towards online modality or blended learning modality in instruction. The complete online modality of the curriculum delivery during the COVID -19 era could be feasible. For instance, in China which was the first epicenter of the virus, more than 180 million children were ordered to remain at home. However, as schools were closed for quarantine, education had to continue but with an altered modality. It was implemented online through a variety of online courses and electronic textbooks (Platinos and Shinis, 2020).

Moreover, blended learning could be commonly described as an instructional approach that integrated traditional classroom methods and online digital methods (Graham, 2013). It facilitated the physical presence of both teacher and learner with traits of learner control over time. It is in line with this observation that the current study looked at whether more teachers were employed by Teachers Service Commission (TSC) to promote blended learning approach alongside social distancing. Therefore, given these characteristics of blended learning, it provided auspicious prospects for use in education come new normal times. According to Cohapay (2020), while complete online and blended learning sounded like the "holy grail" in this new era in education, it required massive change. The COVID-19 global plague was evidently redefining the approaches to curriculum delivery. However, the study determined how students caught up with school programmes amid COVID-19 and alongside with tight school calendar of mostly nine weeks instead of fourteen weeks.

The closure of many educational systems coincided with the student evaluation period in schools. Therefore, different instructional evaluation practices were adopted as a response to the COVID-19 outbreaks. These practices were likely to be part of the new normal in education. Many schools issued implementing guidelines changing many aspects of the evaluation component of the curriculum (Evans and Ove, 2020). Therefore that time was indeed a new period in the curriculum. Moreover, the COVID-19 pandemic had led governments making drastic decisions on the operation of various economic and social activities. One of the sectors that had been the most affected since the onset of the health emergency had been pre-primary, primary and secondary education. The ultimate reach of remote learning opportunities in some States in US was unclear. However, more than four-fifths of surveyed parents reported that their children were engaged in an online learning programme at the beginning of April. In addition, a survey of teachers found that less than 40 percent of them were interacting with students on a daily basis. Thus, there was less provision of instruction, tracking student engagement, or monitor academic progress for all students. Recent evidence from the United States had shown that, following school closures between March and May, students in low-income households lost 36 percent in their math learning, while those in high-income households improved learning by 45.5 percent (Lee, 2020).

Sero prevalence surveys conducted by the Swedish Public Health Agency found that the antibody prevalence in teenagers was 47% compared with 6.7% in adults age 20-64 and 2.7% in adults age 65-70. The relatively high rate in children suggests that there may have been significant spread in schools (Vogel, 2020). Therefore, it was in line with this that the current study established COVID-19 protocols on curriculum delivery in secondary schools in Kakamega County, Kenya.

Several countries in the region implemented emergency measures to maintain some continuity in teaching and learning processes while schools remained closed. These range from using radio and television channels to deliver curricula to the use of mobile phones or virtual platforms. At the same time, countries were faced with uncertainty around how the

pandemic might develop, which determined the timings and conditions for reopening schools.

Countries in the region were already facing a learning crisis and large educational gaps before the pandemic. Furthermore, the measures put in place so far to maintain distance learning were not necessarily suitable for all age groups, as they did not adequately address the respective needs of specific groups. For example, younger children required close supervision, which they did not necessarily receive at home. Moreover, these strategies did not serve all students equally, as they depended on access to unevenly distributed resources for studying at home, such as Internet connectivity, electronic devices, space and parental support. In light of this, and with the prolonged closure of schools, it was feared that the gaps in educational continuity and achievement widened even further, and this is what the current study established in secondary schools in Kakamega County, Kenya. In the face of school closures, most countries in the region implemented distance learning strategies. The implementation of these strategies depended heavily on students' access to specific resources that allowed them to learn at home: availability of books and educational materials at home, availability of a place to study, access to electronic devices and connectivity, and parental support and involvement in the learning process (Pokhrel and Chhetri, 2021). In Sweden, Kay et al., (2020) discovered that, schools were reopened for all students on 14th June, 2020, with no major adjustments to class size, or recess rules being instituted.

In Denmark, students were assigned their own desks which were spaced 6 feet apart from each other. During recess, students were allowed to play only in small groups. Hand washing and sanitization were an additional measure to school re-opening. Students were advised to wash their hands hourly. Students and teachers were not asked to wear face masks. In the context of community transmission, school re-opening in Denmark has not resulted in a significant increase in the growth rate of COVID-19 cases (Stage, et al., 2020).

In Norway, schools were closed on 11th March, 2020 in response to the COVID-19 pandemic. However, re-opening of schools started on 20th April, 2020 for Kindergarten students followed on 27th April, 2020 by students in grade 1 to grade 4. The government recommended that classes be limited to no more than 15 students, with precautions like children washing their desks daily. School for students in grade 5 and above and universities remained closed (World Economic Forum, 2020).

In France, re-opening of nursery and primary schools began on 11th May, 2020. On 18th May, 2020, schools were re-opened for students' age 11 to 15 years old only in green zones; where community transmission was limited. The president of France announced that schools for students 15 to 18 years old would re-open on 22th June, 2020, whereby class sizes have been reduced and face masks were a must in secondary schools (Van Lancker and Parolin, 2020). It is upon this suggestion that the current study established whether physical distancing was practical when schools reopened during COVID-19 era when secondary schools in Kakamega County, Kenya.

In Israel, fewer than 300 deaths had been experienced in early May. This prompted the government to re-open schools, in smaller groups. By 17th May, 2020 limitations on class size were lifted. However, two weeks after school re-opening, COVID-19 outbreaks were observed in classrooms, whereby 130 cases in one school were confirmed. By 3rd June, 2020 there were 200 confirmed COVID-19 cases and over 244 positive COVID-19 tests among students and staff across diversified schools. The government in response, ordered the closure of any school with cases of COVID-19 infections. However, due to the crowded nature of the school system, physical distancing of students within schools has not been widely adhered to and control measures have focused on closing schools with reported cases, extensive testing and quarantine of infected students and staff. By 24th June, 2020, isolation and quarantine had affected about 1% of Israeli students (Coughlan, 2020). It is in line with this observation that the current study established the COVID-19

protocols on curriculum delivery in secondary schools in Kakamega County, Kenya.

Rwanda was the first country to be approved for COVID-19 funding in order to address the immediate education challenges brought by the COVID-19 pandemic. In Rwanda, there was equitable expansion of remote learning opportunities by broadcasting curriculum-aligned radio lesson; alongside with promoting the use of alternative audio-visual materials on TV and on social media. To make sure there was safe re-opening of schools, the existing model of school grants was revised to include COVID-19 response measures that included:

- Increasing the provision of hand washing facilities and water tanks.

- Establishing catch-up programs for students at risk of repetition or drop-out.

- Supplemental grants to provide lunch and learning materials to the most vulnerable pre-primary and primary students for the first term after re-opening.

- Training teachers in school safety guidelines through radio, television and online channels.

- A back-to-school campaign to educate students and the community at large on disease prevention and ensure all children, including girls and children with disabilities, return to school.

The PISA data made it possible to examine the gaps in educational resources reported by students themselves in some of the countries in the region. According to data from 2018, on average 76.1 percent of 15-year-old students had a space to study at home and 67 percent had a desk. An environment that facilitates learning at home involved support from caregivers, particularly for younger children (Castro, et al., 2015)

While in the current crisis students had access to some form of distance learning, access to and the quality of that education depended on the availability of learning resources at home.

In Kenya, specifically, Kakamega County, COVID-19 led to closure of schools which had resulted to loss of teaching and assessment time, therefore, impacting on curriculum delivery. It was not possible to define the lifespan of COVID-19 crisis and thus a need to put in place measures to circumvent loss of teaching time (Sintema, 2020). In addition, schools provided more than just academics to children and adolescents. Apart from reading, writing and mathematics, students learn social and emotional skills, get exercise and have access to mental health and other support services. Therefore, schools were safer stimulating and engaging places for students in Kakamega County.

One of the chief impact of COVID-19 to learners is absence of physical contact with teachers for content delivery. This has been occasioned by Ministry of Health's (MoH) regulations of social distancing to avoid fast spread of the virus. This has been momentarily substituted with digital learning. However, inaccessibility of technology or quick, dependable internet access has barred learners in rural regions and those from underprivileged families. Paucity of access to technology or sound internet connectivity is a hurdle to continuous learning, particularly for learners from underprivileged families. In reaction to institutional closures instigated by COVID-19, UNESCO recommended the utilization of distance learning platforms and open education applications and any other platforms that institutions and instructors can utilize to get in touch with students distantly and minimize the interruption of learning (UNESCO, 2020a)

To support efforts by MoH in reducing the spread of COVID-19, many of the libraries were momentarily closed. In the United States, frequent main states publicized public library cessations, such as San Francisco, Los Angeles, New York and Seattle, affecting two hundred and twenty-one libraries. In Kenya library services were put on halt as from March 15th, 2020 when President Uhuru Kenyatta ordered for the closure of all schools and other public converging places in the country after Kenya reported its first COVID-19 case. For learners

minus library and other educational learning resource centers and internet at home, this escalates the struggle of coping up with distance learning (Hauck, 2020).

Schools play a significant part in the protection of leaners, especially girls in poor, vulnerable and marginalized communities. With over 32, 000 schools closed over 18 million pre-primaries; primary and secondary school learners and over 150,000 refugees are now confined at what they may call 'home'. The risks which the schools they reside in protect them from, are now staring at them bluntly. These learners require home based learning in the so called 'homes' which is hardly available. Similarly, their teachers are at home and require support to help them to remotely learn and ensure continuity of learning process which is impossible (MoE, 2020). The interruption of learning processes further increased anxiety and uncertainty regarding the National Examinations, increased psychological trauma among learners, teachers and parents; inequity in the ongoing online programs as majority of learners do not have access to digital platforms due to lack of devices and internet connectivity at home; different levels of parental knowledge and attitude given that parents are supposed to support children in learning. Confirming parents' and stakeholders' anxiety over exams Education Cabinet Secretary for Education Prof. Maghoha while addressing media briefs organized by Ministry of Health on 26th April,2020, he indicated that Kenyan schools will remain closed for the next one month, following a directive by the government in measures purposed to prevent the spread of coronavirus. The cabinet secretary (CS), however, reported that the national examinations for primary and secondary schools remain on schedule. He pronounced this while not categorical on the opening of schools which he said depended on interventions of the government on the control of the virus. Several Kenyan students pursuing internal curricular in various institutions were left in limbo after cancellation of exams scheduled for May and June 2020 due to COVID19 (Kariuki, 2020). It is in concurrence with this observation that, the current study wanted to find out the effects of COVID-19 protocol on curriculum delivery, especially with shortened / squeezed term dates of nine (9) weeks instead of fourteen (14) weeks.

Co-curricular activities scheduled for first term in the Kenyan school's calendar like drama, athletics and ball games were interrupted midway and stopped as schools were closed abruptly and indefinitely. Play is crucial in as far as learning is concerned. Gergen (2012) submits that it is only by means of play that the intellect of humanity is uncovered. By means of play learners are able to explore, create experiment, adapt, learn, communicate, socialize, and learn problem solving techniques. Further play permits learners to build and have extension of their skills and knowledge in the process of interaction with others, environment, and on their own.

Devices and Technology Respondents to the survey have sophisticated tastes in technology where 68% of them said they use smartphones, smart feature phones, tablets, PCs or laptops at least weekly and only 6% use radio. This clearly presents a sharp contrast to the experience of most ordinary Africans, particularly in rural areas, and may have clouded individual judgments, on occasion, about possible or appropriate technological solutions. In an ideal world, a personal smartphone for every student, particularly in secondary school, might be considered the ideal solution. 43% of our respondents think that online learning is likely to be the most useful solution for secondary school students and it is certainly the case that, for it to work, access to smartphones and other devices would have to be the rule, rather than the exception. It is upon this argument that the current study wanted to find out how classroom content was delivered through internet and radio in consideration with issues of internet connectivity, electricity supply and availability of devices. Affordability may continue to be a significant impediment for the foreseeable future, though. However, the price of smartphones is falling, technology is becoming cheaper and penetration rates are growing. For several of our respondents, smartphones are by far the most attractive option.

The combination of a curriculum that was unsuited to distance learning and geographical or technological factors that hindered access to learning materials often constituted a significant obstacle. Many respondents noted that the most disadvantaged learners as a result of Covid-19 would be poor and geographically dispersed students - essentially, many rural learners. Without electricity, access to TV and radio, and certainly to online learning materials, education was all but impossible. Add to that geographic distance from the school, and access to even paper-based learning materials will be very difficult. Initiatives providing broadly self-directed learning on solar-powered tablets might provide a technical solution to this issue.

Nationwide school closures began on March 16, affecting approximately 9,253,063 learners between pre-primary and secondary education levels (UNESCO and UNICEF, 2020). School closures were partially lifted in the second half of June – through a phased approach and while maintaining social distancing regulations – for final year senior high school and junior high school students with a focus on exam preparation and completion. Second year junior high school and senior high school students returned to school in August to complete the remainder of the 2019-2020 curriculum with the understanding that, as exam students in the 2021 school year, they need to have covered all curriculum content missed during school closures. For other students, closure of schools is still in force and distance learning programmes are continuing to be rolled out by the Ministry of Education (Ministry of Education, Republic of Ghana, 2020a May 5).

The researchers, curriculum designers, education officers, and educational institutions work together to transform the education system during the closures. Educational institutions should design curriculums, prepare learning strategies and techniques for post-COVID-19, and transform the education system itself. During closures curriculum design, collaborations, skill development, and educational institutions should focus on advancing the education system. After COVID-19, the school's design strategies and methods to recover lost learning, ensure children return to school when schools reopen, preparing students, parents, and teachers, and to scale distance learning accessibility (Tiruneh, 2020). School teachers in collaboration with education officers need to give awareness for parents and students to make sure that children are safe at home during school closures and trying to learn and read books as much as possible (Crawford et al., 2020).

There is inequality among urban and rural students; students from low-income or high-income and literate or illiterate parents. So that the education system should design and implement some evidence-based actions that aim to facilitate the recovery of the lost portion when schools are reopened. Because of the lack of required support during the school closures, it could take a very long time for children from illiterate and low-income parents to recover their missed portion when they return to school. Some students from low-income parents may decide to work as daily laborers to support their families financially and may never return to school when schools reopen. Parents from rural areas may be unwilling to send their children back to school because they may prefer their children to continue to support them in cattle herding and farming. The schools should trace those students who do not return to school and also even if the countries recover from COVID-19, parents may fear to send their children back to school so that design strategies to encourage parents to send their children back to school (Tiruneh, 2020).

The education system needs strategies on how to prepare teachers and students to respond effectively and efficiently during and after COVID-19. Teachers may not teach all the time in a face-to-face classroom; students may not learn in the face-to-face class all the time. When the COVID-19 pandemic is over, the education system needs to prepare everyone to be flexible and adapt quickly to various learning platforms during a time of crisis. The global community may need to support the educational systems in developing countries in their efforts to prepare schools, teachers, students, and parents for the future (Zhu and Liu, 2020).

School closures in response to the COVID-19 pandemic have shed light on several issues affecting access to education. COVID-19 is soaring due to which the huge number of children, adults, and youths cannot attend schools and colleges (UNESCO, 2020). Lah and Botelho (2012) contended that the effect of school closing on students' performance is hazy. Similarly, school closing may also affect students because of disruption of teacher and students' networks, leading to poor performance. Bridge (2020) reported that schools and colleges are moving towards educational technologies for student learning to avoid a strain during the pandemic season. Hence, the present study's objective is to develop and test a conceptual model of student's satisfaction pertaining to online teaching during COVID-19, where both students and teachers have no other option than to use the online platform uninterrupted learning and teaching. UNESCO recommends distance learning programs and open educational applications during school closure caused by COVID-19 so that schools and teachers use to teach their pupils and bound the interruption of education. As a versatile platform for learning and teaching processes, the E-learning framework has been increasingly used (Salloum & Shaalan, 2018). E-learning is defined as a new paradigm of online learning based on information technology (Moore et al., 2011). In contrast to traditional learning academics, educators, and other practitioners are eager to know how e-learning can produce better outcomes and academic achievements. Only by analyzing student satisfaction and their performance can the answer be sought. Many comparative studies have been carried out to prove the point to explore whether face-to-face or traditional teaching methods are more productive or whether online or hybrid learning is better (Lockman & Schirmer, 2020; Pei & Wu, 2019; González-Gómez et al., 2016; González-Gómez et al., 2016). Results of the studies show that the students perform much better in online learning than in traditional learning. Henriksen et al. (2020) highlighted the problems faced by educators while shifting from offline to online mode of teaching. In the past, several research studies had been carried out on online learning

to explore student satisfaction, acceptance of e-learning, distance learning success factors, and learning efficiency (Sher, 2009; Lee, 2014; Yen et al., 2018). However, scant amount of literature is available on the factors that affect the students' satisfaction and performance in online classes during the pandemic of Covid-19 (Rajabalee & Santally, 2020). In the present study, the authors proposed that course design, quality of the instructor, prompt feedback, and students' expectations are the four prominent determinants of learning outcome and satisfaction of the students during online classes (Lee, 2014). If well planned, course design increasing the satisfaction of pupils with the system (Almaiah & Alyoussef, 2019). Mtebe and Raisamo (2014) proposed that effective course design will help in improving the performance through learners' knowledge and skills (Khan & Yildiz, 2020; Mohammed et al., 2020). However, if the course is not designed effectively then it might lead to low usage of e-learning platforms by the teachers and students (Almaiah & Almulhem, 2018). On the other hand, if the course is designed effectively then it will lead to higher acceptance of e-learning system by the students and their performance also increases (Mtebe & Raisamo, 2014). The second-factor, Instructor Quality, plays an essential role in affecting the students' satisfaction in online classes. Instructor quality refers to a professional who understands the students' educational needs, has unique teaching skills, and understands how to meet the students' learning needs (Luekens et al., 2004). In education, "prompt feedback can be described as knowing what you know and what you do not related to learning" (Simsek et al., 2017). Christensen (2014) studied linking feedback to performance and introduced the positivity ratio concept, which is a mechanism that plays an important role in finding out the performance through feedback. It has been found that prompt feedback helps in developing a strong linkage between faculty and students which ultimately leads to better learning outcomes (Simsek et al., 2017; Chang, 2011).

The Coronavirus outbreak has forced millions of students to study and learn from home. This is

not a new phenomenon because the home has long been epicentres of learning particularly as regards informal education. Learning from home is becoming a new normal for students. However, the realities of receiving formal education from home could be very challenging to many educators, learners and parents especially those in developing countries where the accessibility, availability and use of technology in education are not widespread. Apart from the cost of accessing online education, many other factors such as network issues, poor power supply, distractions, poor digital skills, inaccessibility and availability issues can also hinder smooth study from home. There is also the problem of time to learn new technologies and noise that emanate internally or externally from neighbours and neighbourhood. Unequal access to technology is another serious concern for many countries. Furthermore, prolonged school closures could deprive millions of students' access to education particularly those in third world countries, rural areas, and people with special needs. UNESCO understood these challenges, and efforts were undertaken to help educators and students in the affected countries to teach and learn online from their homes through the provision of free software that facilitate remote education. Students were expected to optimize the Coronavirus mandatory school closures to improve their digital learning skills and home study habits. The challenges imposed by Coronavirus could be transformed into an opportunity by learners to advance their problem solving skills and digital capabilities (UNESCO, 2020)

Many educational institutions are forced to shut down, which has impacted a large fraction of world's student population. Since face-to-face teaching-learning cannot take place in this time of crisis, the situation has led to forced resortation to online-learning or e-learning (Dhawan 2020). It is defined as "all forms of teaching and learning where the student and instructor are separated geographically and temporally" (Finch and Jacobs 2012). There are several initiatives taken by the Ministry of Education (MoE) to help the students cope with

the loss caused by the interruption of classes due to lockdown. Repositories of thousands of online courses are made available to the students free of cost (ETGovernment 2020). A number of online portals or platforms are offered for e-learning like e-pathshala, NPTEL, SWAYAM (study webs of active learning for young aspiring minds), COURSERA, NIOS (National Institute of Open Schooling), NROER (National Repository of Open Educational Resources). Another initiative by MoE are Massive open online courses (MOOCs), virtual labs, FOSSEE (open source software for education), e-yantra (robotics education) and spoken learning programmes.

The regulators like UGC, NCERT, AICTE have passed the directives to the schools and higher educational institutions to continue the pending course curriculum via online mode (Singh and Thurman 2019). Information technology plays a vital role (Todorova and Bjorn Andersen 2011). There are various virtual platforms which are being used by the various institutions like Google classrooms, Google Meet, Zoom, Cisco Webex, Microsoft Teams. There are two ways into which online learning can be categorised, synchronous learning and asynchronous learning. While asynchronous learning is not structured (Littlefield 2020), synchronous learning gives the flexibility of live interaction with the instructor (Gua 2020).

But the challenges associated with the online teaching-learning cannot be overlooked (Kebritchi, Lipschuetz, and Santiague 2017). First challenge is of accessibility. Providing access of online teaching-learning to rural and remote areas is difficult with poor internet connectivity and network reliability. Another challenge is of adaptability. The adaptation to technology is equally important in virtual mode of learning. The learners as well as the instructor should be comfortable with the virtual online platform being used for teachinglearning. Affordability is another challenge. The virtual teaching-learning environment should be designed in such a way that it is user-friendly, affordable, flexible so that life-long learning can take place with the development of new skills by learning from anywhere anytime (Affouneh,

Salha, and Khlaif 2020). 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, 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. 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).

(UNESCO, 2020) stated that the outbreak of Coronavirus negatively affected educational activities worldwide. The coronavirus pandemic affected educational systems worldwide, leading to the widespread closures of schools. It created serious disruptions in academic activities, as well as in career plans. As part of the global efforts to combat COVID-19, many countries across the world closed down schools in an attempt to contain the coronavirus pandemic. According to the United Nations Educational, Scientific and Cultural Organization monitoring, over 100 countries implemented nationwide closures, impacting over half of the world's student population (UNESCO, 2020a). Even Britain, where Prime Minister Boris Johnson - one of those who earlier opposed the move, later admitted that "closing down schools could place further downward pressure on the upward curve of the Coronavirus outbreak."

No doubts, unplanned school closures can cause severe problems for students, educators, parents and the society at large. It could negatively affect the academic interest and performance of students. If the students are not engaged productively, it could lead to idleness which might result in youth involvement in crimes, loss of interest in learning, and poor academic performance. The US Centre for Disease Prevention and Control (CDC) also expressed concerns about the implications of school closures. According to the CDC, "longer closures may result in more students congregating outside of schools. School closing is very controversial, and it can have spillover effects on a large number of students in receiving schools. It can affect the quality of teaching and learning and academic achievement particularly for students with special needs or those with learning difficulties that often requires more physical attention and guidance from the teachers. Though, technology can be used to remedy some of the fallouts from school closures, but it cannot replace the important effect of face-to-face interactions by students and teachers. Besides, many students do not have the necessary access to supportive technologies which makes it harder to maximize the potentials of learning technology during school closures. However, against all odds, mathematical model and empirical analysis of reactive closures of schools in past pandemics indicates that it reduces the total number of cases in the community by 25 percent and postpones the peak of the pandemic by a week or two, while proactive closures of school during pandemics remains one of the most beneficial

interventions that can be employed to mitigate the impact of epidemic disease.

School closure means the closing down of schools as a result of the pandemic, emergencies, labour strikes, disasters or deliberate efforts to reposition a school or curb crimes in a given campus or environment. This means that school closures are not only for emergencies or pandemics, but also a deliberate way of addressing some identified gaps in a given school. For instance, in Nigeria, the government or school authorities often shutdown schools to address security issues such as cultism, terrorism or violent protests on the campus. As of 23 March, 2020, over 1.3 billion learners were out of school due to school closures in response to COVID-19 (UNESCO, 2020b).

Across Africa, the adoption rate of remote learning has been slow. In early 2020, only 19 million of the 450 million children on the continent had access to edtech (Crawford 2020). Though governments throughout Sub-Saharan Africa strived to increase the supply to provide more remote options, only 23 percent of countries offered some combination of remote-learning strategies (radio, TV, Whatsapp, 5 online, and take-home materials), and not a single country provided training for teachers to learn how to teach remotely (Vegas 2020). This lack of structural support inhibits not only teachers but also children and their families from engaging in remote education.

Across Eastern and Southern Africa, the (limited) offer of remote learning options for young children is evenly distributed across different modalities, such as radio, online learning, television, and paper-based materials (UNICEF 2020c). All in all, despite the still limited evidence on the effectiveness of remote education, even if second-best, these alternatives can be decisive in times of crisis. Nevertheless, while there have been important strides in this regard, the discrepancies in ownership of remote devices at home are still significantly large, such that disadvantaged groups are expected to fall even further behind during the pandemic (Mundy and Hares 2020).

There are stipulated contacts hours which learners are entitle to have with their teachers per day. However, the outbreak of corona virus led to a reduction and to a larger extent removal of the physical contact between learners and tutors. This implied that learners could not closely interact socially with their teachers to be taught. This reduced social interaction was further enhanced by the safety precautionary measures taken by the Ministry of Health to prevent corona virus from spreading by embracing the concept of social distancing. The government of Kenya introduced digital learning to ensure that content is delivered to learners. However, this solution does not allow learners to have a close personalized contact and individualized attention with their teachers. Further, the online teacher cannot perceive whether the learners are understanding the content that is being delivered or not. This is because the online teacher cannot read the mood of learners through facial expressions, gestures, among others. The online teacher cannot know whether all the learners are in attendance in his / her lesson or not. The online teacher can also not judge if the learners are concentrating and paying attention during the lesson or not. The online teacher cannot call his real physical learners by name because the teachers do not know the learners who are following his lesson. Further, the online teacher cannot ascertain whether the learners are writing notes and doing all the assignments they are given. This is because the online teacher cannot mark physically the work of the learners. Hence the online teacher cannot detect the area where the learners are making mistakes or the learners have not understood. All these drawbacks that lead to lack of a close physical social interaction between the learners and their teachers have been brought about by the outbreak of corona virus.

Playing is crucial in the learning process. This is because playing enables learners to explore, create experiment, adapt, communicate, socialize, and learn problem solving techniques. In addition, playing allow learners to build and have extension of their skills and knowledge in the process of interaction with others, environment, and own on their own. Gergen

(2012) opined that it is only by means of play that the intellect of humanity is uncovered.

At the start of the pandemic, the Ethiopian government instituted lessons by radio and satellite TV. The effectiveness of these measures was constrained by only 10% of households in Ethiopia having a TV and 28% a radio, well below the African average (Kim and Rose, 2020).Text messaging had positive effects during school closures in Botswana (Angrist et al., 2020), however, mobile phone penetration is lower in Ethiopia than in other parts of Africa and is still highly stratified by income, as is the capability to exchange files and information through Telegram, the messaging platform widely used in Ethiopia (Kim and Rose, 2020).

Unequal access to the existing infrastructure does not facilitate widespread learning based on information communication technologies. While parents in wealthier households may be able to provide computers, alternative learning activities or private tuition, poorer children have access to fewer educational resources at home (Spaull, 2013). In addition, the more limited education of parents in poorer households may mean they are less able to support their children's home-based learning or take time away from income-generating activities to help their children. In the past, schools in Ethiopia have tried to compensate for time lost from school, for example when children are needed to work on the land during harvest, by providing extra classes (Pankhurst, 2018). Research on shadow education shows that in many parts of the world children access additional teaching time through private classes or individual tutoring to the extent that in, for example, South Korea, payment for private tuition equated to around 2.9% of the nation's GDP (Kim & Lee, 2010). Participation of children in extra classes in low- and middle-income countries is also common (Dang & Rogers, 2008) and viewed as enhancing performance (Glewwe & Kremer, 2006). Evidence from previous research suggests that extra hours of instruction and extensions to the school year can have a positive effect on learning and lead to increased scores in cognitive tests (Aucejo & Romano, 2016; Carlsson et al., 2015; Lavy, 2015). Lavy (2015) finds a lower effect of

additional instructional time in 15 developing countries participating in PISA than in 22 OECD countries. This could be explained by lower school quality, which, as mentioned above, is discussed in Filmer et al. (2020). Lavy (2015) highlights lack of school autonomy and accountability as possible causes.

In Italy, Meroni and Abbiati (2016) find that students who received extra instruction time in mathematics performed better in mathematics (but not language) and developed a more positive attitude towards the subject. Targeted additional instruction time for disadvantaged students can result in an increase in matriculation rates (Lavy, 2015). But there is also variability in findings of the effects of extra classes on pupil performance. For example, in relation to Vietnam, Duc and Baulch (2012), using Young Lives data, find that extra classes do not have a significant effect on pupils' cognitive (mathematics and vocabulary) test scores. In terms of inequality, Rolleston and Krutikova (2014) find that the 'home advantage' (captured by hours of instruction received, extra classes and access to computers and the internet) partly explains learning inequalities in Vietnam.

In sum, the range of effects found in relation to additional tuition underlines the importance of country context and whether lessons are paid for, which we address by distinguishing the effects of classes that families pay for from those provided without additional charge. Drawing on research conducted in the field of shadow education on the effects of extra tuition and the finding that a major factor distinguishing between different types of shadow education is whether it is paid for (Bray & Kobakhidze, 2014), we would expect these two types of additional instruction to differ in their effects.

The preventive measures announced by the Government of Kosovo against the spread of COVID-19 on March 11, 2020, have affected the lives and education of approximately 450, 146 students and 30, 528 teachers/professors in the country (Kosovo Agency of Statistics 2017, 2019; MESTI, 2020c). Days later, the Ministry of Education, Science, Technology and Innovation (MESTI) in cooperation with other actors,

including education directorates at the municipal level and non-governmental organizations, began planning distance learning for children of certain age groups, and for particular subjects (language and mathematics). Weeks later, distance learning for public pre-university education began with video recordings broadcasted on the national television, through which selected teachers, for the subjects of Albanian language and mathematics, presented lessons for students in grades 1-5. Furthermore, in the framework of the plans of the Ministry of Education, Science, Technology and Innovation, for the further planning of distance learning, the tasks and responsibilities for the realization of learning were published, through which the role of each party engaged in educational institutions in the country was specified (Ministry of Education, Science, Technology and Innovation, 2020b).

Studies suggest that alternative social distancing interventions are more effective in preventing deaths than school closures alone and that further research is needed to improve understanding of decision makers on the effectiveness of the school measures being widely implemented (Lancet Child Adolescent Health, 2020).

With the availability of a sea of platforms and online educational tools, the users— both educators and learners—face frequent hiccups while using it or referring to these tools. Some of the challenges identified and highlighted by many researchers are summarized as follows:

Broadly identified challenges with e-learning are accessibility, affordability, flexibility, learning pedagogy, life-long learning and educational policy. Many countries have substantial issues with a reliable Internet connection and access to digital devices. While, in many developing countries, the economically backward children are unable to afford online learning devices, the online education poses a risk of exposure to increased screen time for the learner. Therefore, it has become essential for students to engage in offline activities and self-exploratory learning. Lack of parental guidance, especially for young learners, is another challenge, as both parents are

working. There are practical issues around physical workspaces conducive to different ways of learning. The innately motivated learners are relatively unaffected in their learning as they need minimum supervision and guidance, while the vulnerable group consisting of students who are weak in learning face difficulties. Some academically competent learners from economically disadvantaged background are unable to access and afford online learning (Murgatrotd, 2020).

Student assessments are carried out online, with a lot of trial and error, uncertainty and confusion among the teachers, students and parents. The approach adopted to conduct online examination varies as per the convenience and expertise among the educators and the compatibility of the learners. Appropriate measures to check plagiarism is yet to be put in place in many schools and institutions mainly due to the large number of student population. The lockdown of schools and colleges has not only affected internal assessments and examinations for the main public qualifications like General Certificate of Secondary Educations (GCSE), but A levels have also been cancelled for the entire cohort in the UK. Depending on the duration of the lockdown, postponement or cancellation of the entire examination assessment might be a grim possibility. The education system in schools across the country has been severely impacted due to the ongoing situation. It is also possible that some students' careers might benefit from the interruptions. For example, in Norway, it has been decided that all 10th grade students will be awarded a high-school degree.

School time also raises social skills and awareness besides being fun for the children. There are economic, social and psychological repercussions on the life of students while they are away from the normal schedule of schools. Many of these students have now taken online classes, spending additional time on virtual platforms, which have left children vulnerable to online exploitation. Increased and unstructured time spent on online learning has exposed children to potentially harmful and violent content as well as greater risk of cyber bullying.

School closures and strict containment measures mean more families have been relying on technology and digital solutions to keep children engaged in learning, entertained and connected to the outside world, but not all children have the necessary knowledge, skills and resources to keep themselves safe online.

In the case of online learning in Bhutan, majority of the learners are from rural villages where parents are mostly illiterate farmers. Students are engaged in assisting parents in farm activities such as agriculture, tending to cattle and household chores. Some students even requested to postpone exam time towards the afternoon since they had to work on the fields during morning hours. Some students expressed that they had to attend to their ailing parents/grandparents/family members and take them to hospitals. By evening, when they are back home, it becomes difficult for them to keep abreast with the lessons.

Parents whose children are in lower grades feel that it would be better to let the children repeat the next academic year. Majority of students do not have access to smartphones or TV at home in addition to poor Internet connectivity. There is no or less income for huge population due to closure of business and offices. The data package (costs) is comparatively high against average income earned, and continuous access to Internet is a costly business for the farming community.

Online face-to-face classes (video) is encouraged by most; however, some students (economically disadvantaged) have expressed that the face-to-face online class consumes more data packages. The teachers are in dilemma as to whom to listen to and which tools to adopt. Some think pre-recorded videos could help; however, this would restrict interactions. It is difficult to design a proper system to fit the learning needs and convenience of all students (United Nations, 2020).

A course's instructional delivery method describes how the instructors will deliver a lesson (JHU, 2021). The interaction between the teacher and the student is referred to as instructional delivery in this context. Its key points are the content and skills required by students. In a learning environment, they contribute to learning and collaboration with others. The teacher should be familiar with the curriculum and resources being used. Curriculum delivery is being transformed in order to improve learners' encounters and interactions with concepts and learning experiences. The selection and production of high-quality curricula and instructional materials should result in transformative curriculum delivery. Curriculum delivery is thus intended to improve learning and teaching experiences in schools. Curriculum delivery in this context includes how students acquire skills.

Teachers use a variety of teaching methods. The teaching styles include generalized friendliness or sternness. According to Mackatiani (2017), sternness leads to learners being overburdened with homework on a daily basis. The preferred instructional strategies of the teachers are also included in the teaching styles. Teaching style, according to Atasoy et al. (2018), is more than just personality. It is related to teaching philosophy. It is also influenced by their classroom confidence or self-efficacy (Imbova M. et al., 2018; Mackatiani C. et al., 2017; Mackatiani C. et al., 2020; Zhang et al., 2019). Despite the fact that there are numerous descriptions and inventories of teaching styles, Grasha (1994) proposed five teaching styles. Expert, formal authority, personal model, facilitator, and delegator are some of the teaching styles. Each teaching style has advantages and disadvantages.

The expert approach assumes that the instructors are knowledgeable about a subject. The teacher's role is to help students gain competence by imparting knowledge. Furthermore, the formal authority approach is similar to the experts' approach. Because of their education, background, and position, the instructors' role in formal authority has status. Formal powers are more concerned with enculturating students into a field or discipline by ensuring the "right culture." In the personal model, however, instructors lead by example and model behavior. The personal model demonstrates the teacher's skills and processes.

Students are guided through hands-on activities by the teacher. The facilitator is a coach who is concerned with fostering learners' independence. Finally, the delegator approach is student-centered. The delegator ensures that students are self-sufficient. Delegators may assign projects or problems to students to complete on their own. Grasha's (1994) model of five teaching styles can be used in six different modes of curriculum delivery. The delivery of instruction in Face-to-Face is organized around in-person classroom meeting times. Converged learning combines physical and virtual classrooms to deliver instruction regardless of location. Furthermore, synchronous online ensures that instruction is delivered at the specified time and day, regardless of location. Furthermore, instruction is delivered online. Face-to-face sessions are not available to students. There is also hybrid teaching delivery, in which some traditional face-to-face contact hours are replaced by required synchronous or asynchronous online instruction. In synchronous online delivery, instruction takes place at the specified time and day, regardless of location. The learning management system is used to complete all learning activities online. There will be no face-to-face sessions, but remote participation is expected. Asynchronous online learners engage in activities at various times and locations, utilizing multimedia learning technologies.

In Kenya, the Sessional Paper No. 1 of 2005 on A Policy Framework for Education, Training, and Research reinforces the government's commitment to improving educational quality at all levels in order to produce people with the necessary knowledge and skills to face the challenges of the twenty-first century. The issue of curriculum delivery was addressed in the policy paper. The traditional method of curriculum delivery is face-to-face. The delivery of instruction in this mode is organized around in-person classroom meeting times. Teachers' instructional methods are a major source of concern.

Although the government has created a curriculum, the resources available are insufficient. Due to limited resources, teacher-centered pedagogical approaches are used (Mackatiani et al., 2018). Furthermore, Mackatiani et al. (2017) discovered that understaffing of teachers contributes to school inefficiency by impeding the effective teaching-learning process. Without appropriate instructional methods, such measures cannot improve learning achievement. There is empirical evidence that teachers' instructional strategies influence student learning achievement. Teaching methods help teachers deliver content in order to meet stated objectives and learning outcomes.

Kenya's educational system is based on examinations (Mackatiani, 2017). Despite this, instructional approaches are centered on exams. As a result, teacher-centered techniques are employed. As a result, the exam-driven model leads to inefficiency in education. According to a 2016 KNBS economic survey, the pupil completion rate (PCR) in primary schools is low. This is consistent with the findings of KNBS (2016), who found that the PCR increased from 78.5 percent in 2014 to 82.7 percent in 2015. Learners are forced to repeat grades, particularly in class seven and form three. Headteachers encourage the practice in order to ensure that students enrolled in national examinations excel.

The emergence of COVID-19 resulted in the unexpected closure of educational institutions worldwide. To keep the epidemic from spreading, countries had to look for alternatives to traditional learning methods in schools. E-learning has largely replaced traditional face-to-face academic methods. This was done to prevent the virus from spreading through social gatherings in educational institutions. As a result, the education sector was forced to embrace e-learning. E-learning refers to a formal learning system that uses electronic resources. Teaching in e-learning can be done entirely online using computer technology.

According to several studies (Aboagye et al., 2020; Mackatiani &Likoko, 2022; Mackatiani, Likoko &Mackatiani,2021), the internet is the primary component of e-learning. E-learning eliminates the effort and travel costs associated with traditional learning. It also reduces the

amount of administrative action, preparation and lecture recording, attendance, and leaving classes significantly. Teachers and students recognize that online learning methods encourage students to pursue lessons from anywhere and under difficult circumstances that prevent them from attending school. As a result, the student becomes self-directed. As a result, e-learning is the best option for preventing the spread of epidemics. ICTs (information and communication technologies) provide opportunities to enhance teaching and learning. Furthermore, Abdullah et al. (2020) state that ICT promotes the development of an educational policy that promotes creative, innovative thinking.

However, there are some difficulties with e-learning. The most important one is theoretical knowledge acquisition. The other uses everything that students have learned without putting it into practice. Furthermore, the face-to-face learning experience is missing, which may be appealing to many learners and educators. Other difficulties stem from the online assessments, which have a limited number of objective questions. According to Somayeh et al. (2016), the main disadvantage of e-learning is the lack of critical personal interactions between students and teachers. Lizcano et al. (2020) conclude that students are less likely to benefit from it. Despite the challenges it faces, e-learning ensures spatial distancing. Because of time, location, and health concerns, e-learning is adaptable. It encourages the acquisition of knowledge and skills by providing access to massive amounts of data, improving collaboration, and fortifying learning-sustaining relationships.

Kenya is a Sub-Saharan African country with a population of 26 million children. According to UNESCO (2020), school closures impacted approximately 14.3 million students. Kenya needed to implement virtual learning. Digital learning must be implemented in schools. As a result, teachers and students were forced to participate in e-classes in order to slow the spread of the COVID-19 pandemic. National media outlets were to provide children with educational opportunities. Educational programming was to be broadcast on television and radio stations. Learners were to attend classes from the comfort of their own homes. According to the MoE (2020), the measure is fraught with difficulties. Many Kenyan students lack access to digital learning tools. This is due to a variety of underlying factors, including income disparities, limited or no access to electricity for certain segments of the population, and other social and cultural factors.

The first national goal of education in Kenya is *to foster nationalism, patriotism, and promote national unity* (MoE *Sessional Paper,* 2018). All the people of Kenya belong to different communities, races and religions. They should be able to live and interact as one people. The education sector has therefore been charged with the responsibility of enabling learners to acquire a sense of nationhood and patriotism. It should also promote peace and harmonious co-existence. Institutions of learning achieve this goal by giving all the learners a chance to work together as a team irrespective of their social status, religion, race and tribe. This is attained through peer teaching, team teaching, collaboration, group discussions, creating family units within the institutions, games and sports, competitions, clubs and societies, debates, building team spirits, among others. All these activities require learners to interact with each other closely by working together, shaking hands and touching each other. Nevertheless, this corona virus crisis has impeded the attainment of this goal of education in

Kenya. This is because the learners who are already at home cannot be able to come together and work together to achieve a given objective. For instance, all the co-curricular activities like games, sports, music, drama athletics, and others which were scheduled for first term in Kenyan were interrupted when institutions closed abruptly (Areba, 2020).

Materials and Methods

Research Design

Sileyew (2019) establishes that research design is intended to provide an appropriate framework

for a study. It determines how relevant information for a study will be obtained. Furthermore, research design refers to the overall strategy that you chose to integrate the different components of the study in a coherent and logical way, thus ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement and analysis of data. This study was conducted through a descriptive survey research design. Descriptive survey gather data about varying subjects and the data aims to know the extent to which different conditions can be obtained among these subjects. This research design was suitable for this study because it appropriately answered the research questions. It provided the required data more quickly and it enabled the gathering and analysis of the relevant information. It also facilitated in collecting information about people's attitudes and opinions (McLeod, 2018). The study employed descriptive survey design where the participants answered questions after which the researcher described the responses given.

Sampling Procedure and Sample Size

According to Kerlinger (2004), thirty percent (30%) of the target population represents the sample size of the study. Therefore, thirty percent (30%) of the targeted 195 public secondary schools were 59 public secondary schools. The study applied stratified sampling in obtaining the 59 secondary schools thus, 59 principals and 159 teachers. The study employed stratified random sampling to put schools in strata that is 15 boy public secondary schools, 15 girl public secondary schools and 29 mixed public secondary schools totaling up to 59 public secondary schools. Purposive sampling technique was used to select school principals since they belonged to public secondary schools in the strata, which provided the required information for the objectives of the study. The study used simple random sampling to select teachers.

Table 1. Sample Size Category

Respondents	Population size	Sample size	%
Principals	195	59	30
Teachers	1590	159	10
Total	1785	218	12

Source: Researcher (2023)

Results

Effects of COVID 19 on Curriculum Delivery in Secondary Schools in Kakamega County

The objective of the study was to establish the effects of COVID-19 on curriculum delivery in secondary schools in Kakamega County. This objective was addressed by; first, investigating the level of curriculum delivery during the covid 19 period, secondly, an inferential statistic was used to establish whether COVID-19 has statistically significant influence on level of curriculum delivery in secondary school. Data was collected through questionnaires from the teachers on various aspects, themes and indicators. In this section, the score of 1 was assigned to strongly agree, 2 to agree, 3 not sure, 4 to disagree and 5 to strongly disagree.

The average mean score is 2.5. The findings are presented in Table 2.

Table 2 reveals that although many secondary schools in Kakamega County had challenges shifting from physical to online methods of curriculum delivery due to network connectivity during the COVID-19 period (mean = 3.26 , SD = 1.152). 64 (48%) teachers agreed that secondary schools in Kakamega had challenges shifting from physical to online methods of curriculum delivery due to network connectivity during the COVID 19 period while 16 (12%) teachers strongly disagreed. 12 (9%) teachers strongly agreed, 4 (3%) teachers were not sure while 38 (28%) teachers disagreed. This suggests that lack of network connectivity posed a

challenge to teachers in secondary schools in Kakamega County, limiting shifting from physical to online methods of curriculum

delivery in secondary schools in Kakamega County.

Table 2. Descriptive Statistics on the Effects of COVID 19 on Curriculum Delivery

Attributes of effects of COVID 19 on curriculum delivery (n=134)	SA		A		NS		D		SD		Mean	Std.
	n	%	n	%	n	%	n	%	n	%		
In my school we had challenges shifting from physical to online method of curriculum delivery during COVID 19 period	12	9%	64	48%	4	3%	38	28%	16	12%	2.26	1.152
There was delay in syllabus coverage	21	16%	68	51%	11	8%	15	11%	19	14%	2.56	0.410
There was incoherent use of online methods of curriculum delivery due to network connectivity	31	23%	62	46%	13	10%	7	5%	21	16%	2.45	1.182
There was a challenge in instructional delivery as some of the students lacked the necessary gadget for online learning	28	21%	64	48%	17	13%	16	12%	8	6%	2.34	0.754

Key: SA- Strongly Agreed, A- Agreed, NS- Not sure, D- Disagreed, SD- Strongly Disagreed.

Source: Field Data, 2022.

More than three quarters of the secondary schools in Kakamega County had delay in syllabus coverage during the COVID 19 period (mean = 2.56, SD = 0.410). 68 (51%) teachers agreed that secondary schools in Kakamega County had delay in syllabus coverage during the COVID 19 period 21 (16%) teachers strongly agreed, 11 (8%) teachers were not sure, 15 (11%) teachers disagreed and 19(14%) teachers strongly agreed. This indicates that the squeezed term dates/term calendar could have led to delay in syllabus coverage, thus affected curriculum delivery.

The study established that majority of the secondary schools in Kakamega County had incoherent use of online delivery of curriculum during the COVID 19 period (mean = 2.45, SD = 1.182). 62 (46%) teachers agreed that secondary schools in Kakamega County had incoherent use of online delivery of curriculum during the COVID 19 period. 31 (23%) teachers strongly agreed, 13 (10%) teachers were not sure, 7 (5%) teachers disagreed and 21(16%) teachers strongly agreed. This implies that most secondary schools in Kakamega County likely faced challenges of network connectivity, lacked electricity and necessary gadget for online learning. This led to incoherent use of online

delivery of curriculum, thus generally affecting mode of curriculum delivery.

More than half of the public secondary schools in Kakamega County had challenges in instructional delivery as some of the students lacked the necessary gadget for online learning (mean = 2.34, SD = 0.754). This was reflected by the response of the teachers which revealed that 64 (48%) teachers agreed that secondary schools in Kakamega County had challenges in instructional delivery as some of the students lacked the necessary gadget for online learning. 28 (21%) teachers strongly agreed, 17 (13%) teachers were not sure, 12 (8%) teachers disagreed and 8 (6%) teachers strongly agreed. This suggests that most students in public secondary schools in Kakamega County lacked the necessary gadget for online learning during COVID-19 period thus affecting curriculum delivery.

Effects of COVID 19 on Curriculum Delivery in Secondary Schools in Kakamega County Based on School Category

To study the effects of COVID 19 on curriculum delivery in secondary schools in Kakamega County based on school category, one way MANOVA (Multivariate analysis of

variance) was used to analyze differences in the respondents' views. The results are presented in table 3 below.

Table 3. Descriptive Statistics on the Effects of COVID 19 on Curriculum Delivery in Secondary Schools in Kakamega Based on School Category

Sentiments on of effects of COVID 19 on curriculum delivery (n=134)	Schools Means			Weighted mean	One way MANOVA	Sig.
	National and extra county	County	Sub county			
In my school we had challenges shifting from physical to online method of curriculum delivery during COVID 19 period	2.6	1.9	2.8	2.26	198.236	.000
There was delay in syllabus coverage	2.4	2.6	2.9	2.56	42.321	.012
There was incoherent use of online methods of curriculum delivery due to network connectivity	2.5	2.1	2.9	2.45	98.252	.000
There was a challenge in instructional delivery as some of the students lacked the necessary gadget for online learning	2.4	2.2	2.8	2.34	2.536	.862

Result in table 3 a majority of teachers indicates that their schools had challenges shifting from physical to online method of curriculum delivery during COVID-19. However on further analysis using one way MANOVA, there was a significant difference in the responces of the teachers based on the category of schools ($F_{(4,132)} =198.236$), p<0.0001) at α= 0.05). The national and subcounty schools had the most challenges when it comes to shifting from physical to online method of curriculum delivery during COVID 19 period. National schools had a mean of 2.6 while the subcounty schools had a mean of 2.8. County schools had the least challenges (mean =1.9). This indicates that the subcounty schools probably had challenges with electricity and network connectivity which hindered them from shifting from physical to online method of curriculum delivery during COVID-19.

On the issue of "delay in syllabus coverage" teachers revealed that most schools had challenges in covering the syllabus during the COVID 19 period (mean =2.56). On further analysis using one way MANOVA, there was a significant difference in the responses of the teachers based on the category of schools on syllabus delay ($F_{(4,132)} =42.321$), p=0.012) at

α= 0.05). National schools and county schools had lower challenges on syllabus delay. National schools had a mean of 2.4 while county schools had a Mean of 2.6. subcounty schools had the most challenge when it came to syllabus coverage (mean =2.9). This implies that Subcounty schools were mostly affected by COVID-19 which resulted in delay of syllabus coverage.

The teachers further revealed that there was incoherent use of online methods of curriculum delivery due to network connectivity (mean =2.45). On further analysis using one way MANOVA, there was a significant difference in the responses of the teachers based on the category of schools on incoherent use of online methods of curriculum delivery due to network connectivity ($F_{(4,132)} =98.252$), p<0.0001) at α= 0.05). National schools and county schools had lower challenges use of online methods of curriculum delivery due to network connectivity. National schools had a mean of 2.5 while county schools had a mean of 2.1. Sub county schools had the most challenge when it came to incoherent use of online methods of curriculum delivery due to network connectivity. This shows that subcounty schools were the most affected by COVID-19 pandemic. (Mean =2.9).

However when it came to challenges in instructional delivery as some of the students lacked the necessary gadget for online learning, the teachers responses based on category of schools were not statistically significant (($F_{(4,132)} = 2.536$), p= .862) at α= 0.05)

Spearman Correlation on the Effects of COVID 19 and Curriculum Delivery

In order to establish the relationship between effects of COVID 19 and curriculum delivery in secondary schools in Kakamega County, spearman correlation analysis was used to find out if there existed a relationship. A correlation is a number between -1 and +1 that measures the degree of relationship between two variables. The correlation coefficient value (r) that ranges from 0.10 to 0.29 would be considered weak, from 0.30 to 0.49 would be considered medium and from 0.50 to 1.0 would be considered strong. Therefore, a positive value for the correlation would imply a positive relationship and a negative value for the correlation would imply an inverse or negative association. The study findings are shown on Table 4.

Table 4. Spearman Correlation of COVID 19 and Curriculum Delivery

	Spearman Correlation	1	2	3	4	5
1. Effects of COVID 19	Correlation	1				
	Sig.					
2. In my school we had challenges shifting from physical to online method of curriculum delivery during COVID 19 period	Correlation	.563**	1			
	Sig.	.032				
3. There was delay in syllabus coverage	Correlation	.751**	.487*	1		
	Sig.	.000	.023			
4. There was incoherent use of online methods of curriculum delivery due to network connectivity	Correlation	.459**	.665**	.627**	1	
	Sig.	.036	.004	.012		
5. There was a challenge in instructional delivery as some of the students lacked the necessary gadget for online learning	Correlation	.012	.125	.354**	.253	1
	Sig.	.854	.543	.042	.651	
**. Correlation is significant at the 0.05 level (2-tailed)						

Source: Authors, 2023

Based on this correlation matrix in table 4, there exists a correlation between effects of COVID 19 and curriculum delivery in secondary schools in Kakamega County. Indeed, COVID 19 correlated with curriculum delivery in secondary schools. The correlations were between 0.012 to 0.751. Therefore, curriculum delivery in secondary schools was likely affected by COVID 19 pandemic.

The Spearman correlation index obtained on the first variable "In my school we had challenges shifting from physical to online method of curriculum delivery during COVID 19 period "is r= 0.563, it is positive with ρ= 0.032 which is less than alpha = 0.05 which means that shifting from physical to online method of curriculum delivery during correlates with COVID 19.

The second variable "delay in syllabus coverage" strongly correlated COVID 19. (r =0.751, ρ<0.0001) at α= 0.05).

The third variable. "There was incoherent use of online methods of curriculum delivery due to network connectivity" weakly correlated with COVID 19. ((r =0.459, ρ=0.012) at α= 0.05). The correlation between the last variable "There was a challenge in instructional delivery as some of the students lacked the necessary gadget for online learning" and COVID 19 was not statistically significant (r =0.012, ρ=0.854) at α= 0.05).

Hypothesis Testing

The objective of the study was to find out the effects of COVID-19 on curriculum delivery in secondary schools in Kakamega County. To

achieve this objective, the following hypothesis was formulated and tested. The first null hypothesis of the study stated that:

Ho: There is no statistically significant relationship between the effects of COVID-19 and curriculum delivery in Kakamega County secondary schools.

The hypothesis was stated to establish the extent to which the effects of COVID 19 influence curriculum delivery in Kakamega County secondary schools. Simple linear regression analysis was used to test the hypothesis at 0.05 alpha levels. Tables 5, 6, and 7 showed the information from the analysis.

Table 5. The Regression Model Summary for COVID 19 Effects on Curriculum Delivery

Model Summary				
Model	R	R- Square	Adjusted R- Square	p-value
1	.436	.385	.325	.000
a. Predictors: (Constant), COVID-19				
b. Dependent Variable: Curriculum delivery				

Table 5, shows the value in R, (r = .436), indicating there was a medium positive relationship between the two variables- curriculum delivery and effects of COVID-19. The coefficient of determination indicated adjusted R-Square, (R^2 = .325), reveals the amount variability in curriculum delivery that can be explained by effects of COVID-19. In this case, the value of R square reveals that

32.5 % variability in curriculum delivery can be explained by effects of COVID-19. The analysis indicates that 67.5 % unexplained variation can be attributed to other factors not included in this model. Table 5 discloses whether or not the model is a significant predictor of curriculum delivery.

Table 6 presents the ANOVA results.

Table 6. ANOVA Test for effects of COVID-19 and Curriculum Delivery

Model		Sum of Squares	Df	Mean Square	F	Sig.			
1	Regression	965.26	1	352.26	143.32	**.000**			
	Residual	235.25	133	102.36					
	Total	1200.51	134						
a. Predictors: (Constant), COVID-19									
b. Dependent Variable: Curriculum delivery									

The analysis in Table 6 shows ANOVA results of F=143.32 with 1 and 133 degrees of freedom and F being significant at p<.05. Given this result, it can be presumed that the regression model significantly predicts the extent to which effects of COVID-19 affect curriculum delivery. The regression equation

establish from this output may be stated as F (1,133) =143.32 p=.000< .05). Furthermore, Regression Coefficient (Table 7) reveals how

(effects of COVID-19) the predictor variable contribute to the model.

Table 7 shows the results of the regression coefficient. It is the equation that provides information about the change in the value of the dependent variable (curriculum delivery) corresponding to one unit change in the independent variable (effects of COVID-19). The data on Table 7 indicates model

Table 7. Regression Coefficient for effects of COVID-19 and curriculum delivery

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	6.23	18.965		76.27	.000
	effect of COVID-19	.14	.625	.452	5.325	.000
a. **Predictors**: (Constant), effect of COVID-19						
b. **Dependent Variable**: curriculum delivery						

Y (curriculum delivery) = 6.23 + 0.14 X_1 + ε
(X_1= effects of COVID-19)

Where Y is the estimated value of the dependent variable, and X is the value of the independent variable. From the foregoing, results of the regression coefficient reveal that a unit (1) increase in effects of COVID-19 leads to increase curriculum delivery by a 0.16 units.

The findings of the regression indicated effects of COVID-19 explained significant proportion of variation in curriculum delivery, R^2= .413, $F_{(1,373)}$ =143.32, $p<.0001$). Based on this evidence, the study rejected the null hypothesis **Ho$_1$** that 'there is no statistically significant relationship between effects of COVID-19 and curriculum delivery in Kakamega County secondary schools. The findings on table 7 concurs with burgess and Sievetsen (2020) that school closures due to COVID-19 interrupted the teaching for students in Kenya. However, this result reflects the position that Corona outbreak presented the opportunity to implement online learning as academic systems require to be in touch with the swift emergence of fresh technologies, therefore making online, blended and remote learning a need across the world.

Conclusion

From the findings, the study concluded that COVID-19 had adverse effects on curriculum delivery in secondary schools in Kakamega County.

Conflict of interests

Authors declared no conflict of interest.

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