

**AFTERMATH EFFECT OF COVID-19 PANDEMIC ON
CHEMISTRY STUDENTS ACADEMIC PERFORMANCE
IN PRIVATE AND PUBLIC ILORIN WEST SECODARY
SCHOOLS WASSCE**

BY

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CERTIFICATION

This project is been read and approved as meeting the requirements in partial fulfillment for the award of Bachelor in Education (Degree).

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DEDICATION

This work is dedicated to the Almighty Allah, for sparing my life throughout the period of my programme and to my beloved and amiable parents and my families in general for their moral and financial support towards the success of my completion of this programme.

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ABSTRACT

This study was designed to examine the aftermath effect of covid-19 pandemic on chemistry student's academic performance in private and public Ilorin west secondary schools WASSCE. Some students choose the courses for which they are intellectually suited or are familiar with. Many factors have been highlighted by different scholars as possible courses of the choice of student's field of study but the literature is still very few. In light of the choice, there is need to study the factors that actually influences the choice of the course of study by science students. The study use questionnaire to obtain the required data. The target population was stratified by department in order to determine the sample units for his study. This stratification from the different parts of the population by taking them as strata. Factors which influence undergraduate choice of field of study were identified from the pilot survey and used to structure a questionnaire. The data were collected and analyzed using proportions and chi-square. The results shoed that the use of modern pedagogical technology influence of career choice chemistry education among secondary school students bright future in chosen career, well secure jobs guarantee. Prospect for well-paid job and career, job availability (man power need of the country), personal interest in the field of study, performances in secondary school career development teacher and adviser, reputation of the field of study and peer influence

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CHAPTER ONE

INTRODUCTION

Background to the study

According to the World Health Organization (WHO), coronaviruses are a family of viruses that cause illnesses ranging from the common cold to more severe diseases such as severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS). These viruses were originally transmitted from animals to people. SARS, for instance, was transmitted from civet cats to humans while MERS moved to humans from a type of camel. Several known coronaviruses are circulating in animals that have not yet infected humans. The name coronavirus comes from the Latin word corona, meaning crown or halo. Under an electron microscope, the looks like it is surrounded by a solar corona. The novel coronavirus, identified by Chinese authorities on January 7 and since named SARS-CoV-2, is a new strain that had not been previously identified in humans. Little is known about it, although human-to-human transmission has been confirmed.

Chinese health authorities are still trying to determine the origin of the virus, which they say likely came from a seafood market in Wuhan, China

where wildlife was also traded illegally. On February 7, Chinese researchers said the virus could have spread from an infected animal species to humans through illegally-trafficked pangolins, which are prized in Asia for food and medicine. Scientists have pointed to either bats or snakes as possible sources of the virus.

According to the WHO, signs of infection include fever, cough, shortness of breath and breathing difficulties. In more severe cases, it can lead to pneumonia, multiple organ failure and even death. Current estimates of the incubation period - the time between infection and the onset of symptoms - range from one to 14 days. Most infected people show symptoms within five to six days. However, infected patients can also be asymptomatic, meaning they do not display any symptoms despite having the virus in their systems. (Wikipedia, 2020)

The number of fatalities from the new coronavirus has overwhelmingly surpassed the toll of the 2002-2003 SARS outbreak, which also originated in China. SARS killed about 9 percent of those it infected - nearly 800 people worldwide and more than 300 in China alone. MERS, which did not spread as widely, was more deadly, killing one-third of those infected. As of April 4, more than 60,000 people worldwide have died of COVID-19, the

highly infectious respiratory disease caused by the coronavirus. The number of people who have tested positive for COVID-19 has exceeded 1 million, according to data compiled by Johns Hopkins University. While the new coronavirus is more widespread than SARS in terms of case numbers, the mortality rate remains considerably lower at approximately 3.4 percent, according to the WHO. Scientists around the globe are racing to develop a vaccine but have warned it is not likely one will be available for mass distribution before 2021. There have been five global health emergencies since 2005 when the declaration was formalized: swine flu in 2009, polio in 2014, Ebola in 2014, Zika in 2016 and Ebola again in 2019.

As of April 13, more than 70,000 people worldwide have died of COVID-19, the highly infectious respiratory disease caused by the coronavirus. The number of people who have tested positive for COVID-19 has exceeded 1 million, according to data compiled by Johns Hopkins University. Countries around the world are scrambling to halt the spread of the coronavirus pandemic. This outbreak of covid-19 is a global health emergency, the WHO said on January 30, raising the alarm further on March 11 when it declared the crisis a pandemic. (Wikipedia, 2020)

Presently, COVID-19 has spread to about 200 Countries in the World

including Nigeria. Nigeria is a country located in West Africa. The official name of the country is the Federal Republic of Nigeria. The country has a population of 188,462,640 people, making it the 7th most populous country in the world. In terms of area, it is the 32nd largest country at 356,669 square miles. The country is a federal presidential republic with a president and vice president. The capital city is Abuja. On 28 January 2020, the Federal government of Nigeria assured citizens of the country of its readiness to strengthen surveillance at five international airports in the country to prevent the spread of coronavirus. The government announced the airports as Enugu, Lagos, Rivers, Kano and the FCT. The Nigeria Centre for Disease Control also announced same day that they had already set up coronavirus group and was ready to activate its incident system if any case emerged in Nigeria. On 31 January 2020, following the developments of COVID-19 pandemic in mainland China and other countries worldwide, the federal government of Nigeria set up a Coronavirus Preparedness Group to mitigate the impact of the virus if it eventually spreads to the country. On the same day, the World Health Organization listed Nigeria among other 13 African countries identified as high-risk for the spread of the virus. (Wikipedia, 2020) On 27 February,

Nigeria confirmed its first case in Lagos State, an Italian citizen who works in Nigeria had returned on 25 February from Milan, Italy through the Murtala Muhammed International Airport, fell ill on 26 February and was transferred to Lagos State Biosecurity Facilities for isolation and testing. Presently, Nigeria is having 199 covid-19 cases, two death and twenty recovered. In order to contain the spread of the virus in Nigeria, the Federal Ministry of Education has directed all educational institutions in Nigeria to shut down and allow students to go home as cases of reported COVID-19 increased to 13. The Permanent Secretary in the Ministry of Education, Sonny Echono, told reporters on 19 March that the directive was part of the country's overall strategy to contain the spread of the virus. Nigeria joins the growing list of countries in Africa which have closed schools and universities. Before the official announcement by the permanent secretary, most universities had already sent their students home. (Wikipedia, 2020). Education is administered by the federal, state and local governments. The Federal Ministry of Education is responsible for overall policy formation and ensuring quality control, but is primarily involved with tertiary education. School education is largely the responsibility of state (secondary) and local (elementary) governments. The country is

multilingual, and home to more than 250 different ethnic groups. The languages of the three largest groups, the Yoruba, the Ibo, and the Hausa, are the language of instruction in the earliest years of basic instruction; they are replaced by English in Grade Nigeria's education system encompasses three different sectors: basic education (nine years), post-basic/senior secondary education (three years), and tertiary education (four to six years, depending on the program of study). According to Nigeria's latest National Policy on Education (2004), basic education covers nine years of formal (compulsory schooling consisting of six years of elementary and three years of junior secondary education. Post-basic education includes three years of senior secondary education. The direction that all educational institutions in Nigeria should be shut down and allow students to go home as a measure to contain the spread of the virus. This paper is aim to find out the perception of parents on the impact of covid 19 on secondary education in Nigeria

The pandemic in Nigeria's secondary schools, on the other hand, is wreaking havoc on the economies of several low- and middle-income countries. Each session is broken down into three terms, with each term

lasting up to 13-14 weeks of active teaching and learning. Because of the COVID-19 crisis, Nigerian secondary schools were under lock and key at the time. Another study by Badmus and Omosewo (2018) found that pupils have been performing poorly in national tests in recent years, particularly in science courses (Biology, Chemistry and Physics). Because many colleges and institutions have suspended classroom education, a transition to online instruction for undergraduate and graduate students has become effective [reviewed in (Sahu, 2020; Yamin, 2020)]. This type of instruction allows you to reduce or eliminate student-to-student or studentto-lecturer interaction (Pragholapati, 2020). However, due to the economic and digital divide, many students are unable to attend online education due to a lack of resources or technology (UNESCO 2020).

Statement of the Problem

In Nigeria, the Federal government announced the indefinite postponement of the 2020 West African Examination Council and the National Examinations Council (NECO) due to the COVID-19 pandemic.

The situation is depressing. The statistics are scary and the consequences are severe. The numbers are unprecedented and the implications are enormous. Never before have so many children and youths been out of

school at the same time. The consequences are better imagined.

Even before the current closure of schools, the world was already experiencing a global learning crisis, as many students, who, even while the school system was in full swing, were not learning the fundamental skills needed for life,(World Bank 2020).The closure of schools has now further compounded the situation with remarkable impacts on students, teachers, families and far-reaching economic and social consequences. In many countries like Nigeria, poor children rely on the school feeding system for their only meal for the day. But with schools now forced to close, millions of children are missing out on these meals.

Many social vices are associated with youths not actively engaged in schooling. Children and youths who are not in school are more susceptible to social vices such as alcoholism, substance abuse and other forms of criminal activities. Early marriage and child labour are also some of the consequences of school closures.

In an attempt to positively engage the children and also ensure that they are not left behind in their learning journey, many countries including Nigeria have adopted online teaching and learning, using radio, television and internet solutions to support access to education. In order to provide

another window for learning, UNESCO through its COVID-19 Education response, floated a platform tagged Learning Never Stops, to facilitate inclusive learning opportunities for children and youths during this period of sudden disruption in the school system. Recently, the Ministry of Education in Nigeria uploaded on its website electronic learning resources and education chat rooms for the thirty-six states in the country and the Federal Capital Territory, for continuing education and individualized learning for children at home. Laudable as these initiatives appear, they cannot be compared to classroom based instructions and the benefit to the very poor children who rely on schools not only for education, but also for food, healthcare and safety. Moreover, these efforts may not achieve the set objectives, given the limited access of poor children to television, electricity, internet and other equipment needed to take advantage of the e-learning platforms.

Purpose of the Study

The general purpose is to identify effect of covid 19 pandemic on Chemistry students' academic performance in Secondary school . This purpose is forth simply into the following objective for the study;

To explain the effect of covid 19 pandemic on Chemistry students'

academic performance in Secondary school .

Effect of school closure on teaching and learning activities in Secondary school .

To determine the technological therapy deployed to enhance students academic performance in Secondary school .

Research Questions

The following research questions were raised to guide the study:

What are the effects of covid 19 pandemic on Chemistry students' academic performance in some selected private and public Secondary school in Ilorin West Local Government Area of Kwara State?

Does corona virus pandemic outbreak have any negative effect on Chemistry students' performance in some selected private and public Secondary school in Ilorin West Local Government Area of Kwara State?

What are the technological therapies deployed to enhance Chemistry students academic performance in some selected private and public Secondary school in Ilorin West Local Government Area of Kwara State?

Research Hypotheses

The following hypothesis was formulated in this study

HO₁: There is no significant relationship between the effect of corona virus

and Chemistry student's academic performance in Secondary school .

HO₂: There is no significant relationship between corona virus pandemic outbreak and Chemistry students' academic performance in Secondary school .

HO₃: There is no significant relationship between technological therapy employed and Chemistry students' academic performance in Secondary school

Significance of the Study

The research work will be significant and useful in improving Chemistry students' academic performance in Secondary school and Nigeria at large; because its effect of corona virus pandemic on academic of students would have been discovered through this study. The findings will help to sensitize the parents, teachers, students and other education stakeholders to put in place appropriate measure that can minimize or eradicate the effect of covid 19 or any other virus in future. The curriculum developers will find it useful possibly when reviewing the tertiary institutions subjects' curriculum thereby stressing the need for its

development in order to leapfrog into the information age. Furthermore, the study will be useful for other researchers by forming a basis for further studies on covid 19 and its effect on academic performance of students. Funding agencies of like interests, as well as professional bodies can support or formulate policies from recommendations made from the study.

Scope of the Study

The outcome of the study may not be (100%) valid for generalization because some inhibiting factors that served as limitation for the study. However, the study has to be designed to cover large proportion of students in Kwara State College of Education. To make a manageable sample, the study would be limited to the SS 2 and SS3 students in Secondary school .

Operational Definition of Terms and Variable

Effect: the word impact means a significant or strong influence or effect. Also it means to compact or pack together its synonymous or strike.

Pandemic: means widespread or general. According to Oxford dictionary it means epidemic over a wide geographical area and affecting a large proportion (Disease).

Academic: This is the formal ways of impacting learners through the ladder

of schooling for an educational purpose.

Performances: means that which is performed or accomplished; a thing done or carried through; an achievement or public character.

Covid 19: Is a large family of viruses transmitting between animals and people that cause illness ranging from the common cold to more severe diseases such as Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome which affect students performance

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter deals with review of previous literatures and contribution of past scholars on. The review organized under the following sub-headings

Overview of Coronavirus

Global Responses to Coronavirus Pandemic

Impact of Coronavirus Pandemic on Academic Performance of Students

Effects of Coronavirus on Teaching and Learning Situations

Technological Therapy for Coronavirus School Closures

Challenges of Covid 19 on Chemistry Students Academic Performance

Summary of Literature Reviewed

Overview of Coronavirus

Disease Coronavirus Disease is a contagious disease that first emerged in Wuhan, China in 2019. It was later coded “COVID-19” by the W.H.O which stands for Coronavirus Disease 2019. The Coronavirus outbreak remains one of the worst global pandemics for decades. The mortality rate soared and the easy of spread was upsetting. Research shows that older people and those with underlying medical problems like

cardiovascular diseases, diabetes, chronic respiratory disease, and cancer were more likely to develop serious illnesses from coronavirus (W.H.O, 2020). Some of the symptoms of Coronavirus include; Sore throat, runny nose, constant coughing/sneezing, breathing difficulty and fatigue.

As at the time of this study, there were no reliable treatments for Coronavirus, but a series of researches were in the pipeline across the world towards finding a clinical vaccine for the contagion. However, recent events shows that behavioural change can help contain the spread of coronavirus. Some of the suggested measures to halt the coronavirus pandemic include;, improved individual habits such as personal hygiene, including constant washing of hands with alcohol-based sanitizers, good respiratory attitude (close coughing and sneezing), and other personal protection practices like wearing of face mask, social distancing, avoiding touching of the face, and reducing contacts with people through self-isolation at home or avoiding nonessential travels or gatherings. Coronavirus is a global problem that requires more action coordination and global cooperation to successfully contain the outbreak and to deal with its aftermath effects. Consequently, the United Nations appealed for 2 billion dollars to support global response efforts towards tackling the coronavirus

pandemic. The consequences of COVID-19 could be more severe; if people do not comply or adhere strictly to public health regulations and advice.

Global Responses to Coronavirus Pandemic

A proactive response is critical to the containment of any disease outbreak, but the coronavirus took the world by surprise and most countries were not prepared initially for the pandemic, including the world powers. Shortly after the outbreak of COVID-19, the World Health Organization (W.H.O) issued guidelines and updates on how to mitigate the spread of the pandemic, and thereafter, many countries adopted different measures in addition to the W.H.O guidelines to contain the spread of the disease. There were lockdowns in most parts of the world, and people were asked to work from home. Some countries even deployed their military to enforce coronavirus restrictions, and to reduce the number of covidiot. There were increased demands for health equipment including, protective gowns, sanitizers, face masks and hand gloves. Countries like the United States and the U.K also opened their visitation doors for medical professionals such as doctors and nurses who were

working or willing to treat the effects of COVID-19. Also, large gatherings and sporting activities were suspended at both local and international levels. Big sporting events like the prestigious European Champions League games were played behind closed doors before they were suspended. Global responses to Coronavirus pandemic were varied from country to country, but most countries endorsed the closure of school strategy as a means to contain the spread of COVID-19. Some selected COVID-19 responses across the world particularly as it relates to the closure of schools due to Coronavirus are highlighted below:

In the United States, many schools were closed down, and scheduled tests and examinations were also cancelled. The report shows that some of the schools closed down for Coronavirus in the U.S might not resume back for the rest of the academic year (Madeline, 2020). New York and the California States were among the worst-hit states in the U.S and the number of cases increased steadily despite strong measures put in place by both the federal and state governments to contain the pandemic. At a point, the country surpassed China in the number of cases of Coronavirus, but the country is determined to defeat the pandemic. School closures in the U.S affected over 60 million students in the country. In

Spain, about 11 million students were affected by school closures for mitigation of the spread of Coronavirus. Regional governments in the country closed down schools in response to the increased cases of Coronavirus in the country. The closure of schools in Spain particularly in Madrid led to the suspension of job contracts for people who work at school cafeterias and in special education (El Pais, 2020). The closure of schools in Spain was very necessary considering that the country lost 849 people in a day due to Coronavirus.

In Saudi Arabia, Middle East Monitor (2020), reported that schools and universities across the kingdom were ordered to close down for Coronavirus by the Ministry of Education. The government however, directed that “Virtual schools and distance education be activated to ensure that the educational process continues in an effective and quality manner”. In Australia, Michael (2020) reported that dozens of independent schools were shutdown at New South Wales while some moved to online classes. Students learn from home, while some schools were opened but implemented strong measures to ensure social distancing strategy. The opening of schools amidst the coronavirus pandemic was backed by the Australian government. The Prime Minister openly announced that schools

remained open because the government believes that “children are at very low risk from coronavirus, and the closing of schools could have crippling effects on their health sector and the economy”. The government cited solid health case for keeping schools open, but teachers and parents were worried (ABC News, 2020). The country also banned outdoor gathering of more than 2 people, while 18 billion dollars was also approved to mitigate the spread and effects of the Coronavirus.

In Italy, schools were shutdown indefinitely, and the military were deployed to help enforce restrictions. However, despite the measures put in place by the government towards curbing the spread of Coronavirus, the country became an epicenter for the outbreak and recorded 969 coronavirus deaths in a single day.

In India, all schools and educational institutions were closed down and the government imposed “Janata” Curfew which restricted all citizens to stay at home to contain the spread of Coronavirus. The police also went round some cities to create public awareness about the pandemic.

In France, the government ordered the closure of all schools in a televised broadcast by President Macron. The measure was in response to the increased health crisis in the country due to coronavirus. The country

was badly affected just like their counterparts in many parts of the world. The Coronavirus were reported to have originated from Wuhan, China and it was the epicenter at the beginning of the outbreak. Schools and other public institutions were shutdown to mitigate the spread of the virus. The closure of schools and other measures put in place by the government proved effective and the pandemic was contained to a large extent. The country also closed its borders with some neighbouring countries.

In Iran, the government closed all schools as part of the preventive measures to halt the spread of coronavirus. Although, the country was among the epicenter of the coronavirus outbreak, and the death tolls in the country were high. The coronavirus increased Iran's economic problems, having been faced with economic sanctions from the West earlier. In Senegal, schools were shutdown to limit the spread of COVID-19. The country was the first sub-Saharan African country to close down schools due to coronavirus. In South Africa, the government directed all schools to close down in response to the coronavirus pandemic. This is in addition to the prohibition of social gatherings of more than 100 people. New cases were reported in the country and campaigns for behavioral changes were carried out to reduce the spread of the disease.

In Germany, schools were shutdown in response to the spread of coronavirus. The death rate due to coronavirus was reported to be low compared to their neighbours. The country also earmarked more than 800 billion dollars to fight the pandemic. In Russia, Schools were shutdown, and several other measures were taken to halt the pandemic. The death toll for coronavirus in Russia was reported to be low, but measures were put in place to contain the pandemic.

In Nigeria, the federal government ordered a total close down of all schools. The decision was largely applauded, and the National University Commission (NUC), a regulatory body for all universities in Nigeria also gave a follow-up directive to all universities in the country to shutdown. The government also suspended social gatherings, and workers were asked to work from home. An Italian who was reported to be the first case of coronavirus in Nigeria was successfully treated and discharged according to the government, but new cases emerged thereafter. Thus, the country needs to do more in terms of disaster preparedness and response. In Ghana, schools were shutdown to contain the spread of coronavirus disease. The government also released 100 million US dollars to enhance the fight against the pandemic. The country reacted proactively to contain

the spread of the Virus. In Madagascar, the country has recorded zero COVID-19 death so far, and the country has claimed a breakthrough in Herbal medicine for COVID-19 treatment. However, the WHO issued warned that such claim has not been scientifically approved and cannot be recommended by the organization as cure for COVID-19.

Impact of Coronavirus Pandemic on Academic Performance of Students

The outbreak of Coronavirus negatively affected students' academic performance worldwide. The coronavirus pandemic affected educational systems worldwide, leading to the widespread closures of schools (Wikipedia, 2020). 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 (UNESCO) monitoring, over 100 countries implemented nationwide closures, impacting over half of the world's student population (UNESCO, 2020). 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” (ABC News, 2020).

Some of the countries that closed down schools due to COVID-19 include, Nigeria, Ghana, Senegal, South Africa, China, Kazakhstan, Ethiopia, Honduras, India, Japan, Iran, USA, France, Spain, Italy, North and South Korea, Lebanon, Vietnam, Thailand, Germany, and South Korea just to mention but a few. School closures carry high social, educational and economic costs, and the disruptions they cause touch people across communities, but their impact is particularly severe for disadvantaged persons and their families (UNESCO, 2020b). The disruption caused by COVID-19 in the educational sector may last longer than expected if a more reliable solution for coronavirus is not found on time, and the spread of the disease continues. UNESCO Director-General, Audrey Azoulay cited by VOA News (2020), warned that “the global scale and speed of the educational disruption due to corona virus is unparalleled and, if prolonged, could threaten the right to education”.

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. Quentin (2014), states that 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.

Effects of Coronavirus on Teaching and Learning Situations

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. Gewertz (2009) cited in Ben, Mathew, and

Kristen (2018) reported that “Obama’s administration endorsed closure as part of an array of strategies to turn around 5,000 failing schools in the United States during his regime. Even though, school closures sometimes may be for good reasons, but the recent school closures for Coronavirus is detrimental to many educational systems across the world. As of 23 March, 2020, over 1.3 billion learners were out of school due to school closures in response to COVID-19 (Wikipedia, 2020).

According to Erika and Nicholas (2020), school closures can either be reactive or proactive. Erika and Nicholas further stated that reactive closing schools occur upon the discovery of coronavirus case among the students, staff or parents. While proactive school closure occurs before the disease even reaches the doors of the school. Madeline (2020) opined that school closures due to coronavirus has posed new problems like how to make the transition to online and at-home learning, and how to cater for those who rely on school for food and housing security. School closures for coronavirus tends to increase pressures on students, teachers and parents especially those with limited digital skills, education and resources for continued education. It increases the burden on parents to not only struggle to provide for the home, but also to perform the supervision task

of ensuring that their children learn from home. Unparalleled school closures increases the pressure on hospitals because they have to cater for as many health situations as possible that ordinarily could have been attended to by school health centers. Coronavirus school closures could increase student debt, extend the graduation time of students, and shatter the academic dreams of students, as well as programme schedules of educational institutions. Protracted school closures may result to increase rate of dropouts due to loss of interest and lack of resources to continue. If not well managed, school closures can also increase the rate of crimes, because prolonged school closures can lead to idleness which contributes to negative peer influences and youth involvement in crimes. Education jobs were also affected; many workers risk pay cuts or even disengagement from work during unscheduled school closures.

According to UNESCO (2020b), some of the harmful effects of school closures for coronavirus are as follows:

1. Interrupted learning: School provides essential learning and when they are closed, students are deprived of opportunities for growth and development.

2. Nutrition: Many youngsters rely on free or discounted meals provided at schools for food and healthy nutrition. This is compromised as a result of school closures for coronavirus.

3. Unequal Access to digital learning portals: lack of access to technology or good internet connectivity for continued learning during school closures.

4. Increased pressure on schools and school system that remain open; Localized school closures place burdens on schools as parents tend redirect their children to open schools.

Technological Therapy for Coronavirus School Closures

The unplanned closure of schools for COVID-19 came with obvious implications on the education industry globally even though; the decision to close schools appears to be right considering the need to contain the Coronavirus pandemic. The fortuitous closure of schools worldwide revalidated the need for adoption and deployment of cutting edge technologies in education. The outbreak of COVID-19 increased the global demand for online education. Technology has the potential to facilitate education from any location including home. Thus, as the world struggles to contain COVID-19 or any future outbreaks, the use of educational

technology platforms would become the new reality for educational institutions, educators and learners. Technology is integral to student-teacher connection and communication especially in moments of isolations, quarantines, and lockdowns as a result of health crises and other emergencies. Technology is an essential tool to offer educational, psychological, spiritual, and medical advice or supports to parents, educators and students during and after pandemics. Technology aid report of cases, testing and social distancing which are critical to mitigate the spread of COVID-19. In some climes, robots and drones were also used to deliver goods to reduce human interactions. Staying at home all day could be very challenging for students especially the digital mmillennials who are very mobile and inquisitive in nature.

Therefore, with the aid of technology, learners and educators can be productively and educationally engaged to reduce the boredoms during lockdowns for pandemics. Educational institutions that have inculcated the use of emerging technologies in their systems before the outbreak of COVID-19 had a comparative advantage over those who were yet to embrace technology in their operations. Teachers were required to teach remotely and students needed adjustments to the new teaching and

learning techniques. The transition to online education posed a challenge to learners in countries where there were no relevant infrastructures and facilities that facilitate online education. The problem of the digital divide was also a big issue particularly for learners in rural areas. This is because students and teachers in rural areas often lack the needed facilities and expertise to implement remote teaching and learning. While many lacks the required digital skills to implement online education. Technology remains a therapy to bridge the educational gaps that often emanates from unscheduled closure of schools during pandemics.

Technology is a key component of education in the 21st century. The increasing use of technology in education has modified teachers' methods from the traditional approach that often place them as dispensers of knowledge to a more flexible approach where they act more as facilitators, mentors and motivators to inspire students to participate and learn (Onyema & Deborah, 2019). Technology facilitates Remote learning, Distance learning, virtual learning, Blended learning, Mobile learning, Distributed learning, Machine learning, Ubiquitous learning, Deep learning, Cooperative and Collaborative learning. Most aspect of education is going digital, and education stakeholders including students are

confronted with the challenge of transition to online education. The use of appropriate educational technologies increases accessibility to learning resources such as Massive Open Online Courses (MOOCs), and multiple learning approaches to meet the need of diverse learners (Onyema et al., 2019). Online education is a general concept for teaching and learning online with the aid of technology tools and platforms.

The successes of online education depend on factors including, good internet connections, learning software, digital skills, availability and access to technology. Online education platforms are vital tools that support inclusive education and online learning. Online education has its roots in distance education and the emergence of digital technologies that facilitate the efficient and reliable delivery of lectures, virtual classroom sessions and other instructional materials and activities via the internet (Onlineeducation.com, 2020). With the high penetration of the internet and mobile technologies across the globe, online education platforms can be maximized to bridge the gaps in education, thereby reducing the rate of global illiteracy. There are broad ranges of online education tools/platforms that facilitate online education particularly in times of outbreaks like the Coronavirus pandemic. Some of these technology

tools/platforms are listed below:

GoToMeeting.com

Skype.com

Google Classroom/Open Online education (edu.google.com)

Youtube.com

Blackboard.com

udemy.com

coursera.org

memory.com

The use of educational technologies facilitates online education, student teacher interactions, connection and relationships. It enhances teaching and learning experiences, content creation, course sharing, assessments, and feedback. Educators can reach and interact with their students on the go from any location, and lectures can be fixed at any time of convenience. Educators and students can optimize these technologies to supplement classroom teachings, and to improve their digital skills in line with emerging trends in education. More so, knowledge of technology increases educators' and students' interest, competence, confidence, creativity, employability and output, and also prepares them for the future.

Challenges of Covid 19 on Chemistry Students Academic Performance

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 epicenters of learning particularly as regards informal education. Learning from home is becoming a new normal for students. According to Education Task (2020), the majority of university students still prefer to study in the comfort of their own homes because the learners tend to have everything at their disposal without having to leave their chairs. 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.

Summary of Literature Reviewed

Covid 19 Disease is a contagious disease that first emerged in Wuhan, China in 2019. It was later coded "COVID-19" by the W.H.O which stands for Coronavirus Disease 2019. The Coronavirus outbreak remains one of the worst global pandemics for decades. The mortality rate soared and the easy of spread was upsetting. Research shows that older people and those with underlying medical problems like cardiovascular diseases,

diabetes, chronic respiratory disease, and cancer were more likely to develop serious illnesses from coronavirus (W.H.O, 2020). Some of the symptoms of Coronavirus include; Sore throat, runny nose, constant coughing/sneezing, breathing difficulty and fatigue.

In Nigeria, the federal government ordered a total close down of all schools. The government also suspended social gatherings, and workers were asked to work from home. An Italian who was reported to be the first case of coronavirus in Nigeria was successfully treated and discharged according to the government, but new cases emerged thereafter. Thus, the country needs to do more in terms of disaster preparedness and response.

The outbreak of coronavirus negatively affected educational activities worldwide. The coronavirus pandemic affected educational systems worldwide, leading to the widespread closures of schools (Wikipedia, 2020). It created serious disruptions in academic activities, as well as in career plans. According to Erika and Nicholas (2020), school closures can either be reactive or proactive. Erika and Nicholas further stated that reactive closing schools occur upon the discovery of coronavirus case among the students, staff or parents. While proactive school closure occurs before the disease even reaches the doors of the

school. Madeline (2020) opined that school closures due to coronavirus has posed new problems like how to make the transition to online and at-home learning, and how to cater for those who rely on school for food and housing security.

The unplanned closure of schools for COVID-19 came with obvious implications on the education industry globally even though; the decision to close schools appears to be right considering the need to contain the Coronavirus pandemic. There are broad ranges of online education tools/platforms that facilitate online education particularly in times of outbreaks like the coronavirus pandemic.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter deals with the description of the procedures used in gathering vital data for the study. It focused on the following sub- headings

Research Design

Population

Sample and Sampling Techniques

Research Instrument

Validity of the Instrument

Reliability of the Instrument

Administration of the Instrument

Data Analysis Technique

Research Design

Descriptive research involves collecting data in order to test hypotheses or to answer questions concerning the current status of the subject of the study. The study adopted the descriptive survey research design which was deemed appropriate for collecting information from principals, teachers and students on the effect of Covid-19 pandemic on chemistry students' performance in secondary school. This design is

deemed suitable as according to Akuezilo and Agu (2003), the research design used for this study was descriptive survey method to find out the opinion of sampled population or description or respondent. The justification for using survey research method was to enable the researchers to describe the situation, behavior, opinion or characteristics of people relevant to the study under investigation. This design helped the researcher in the collection of relevant data used to investigate the effect of Covid-19 pandemic on chemistry students' performance in secondary school.

Population of the study

The target population of this study consists of Selected secondary school students in Ilorin West L.G.A

Sample and Sampling Techniques

Sample is a portion of the entire population in the field of educational research. Sample and sampling techniques represent the full population on which research was carried out. Thus, in this study 10 (Ten) secondary schools would be randomly selected in Ilorin West L.G.A. One hundred (100) students and Twenty (20) teachers were randomly selected from the secondary schools; twenty (20) students and two (2) teachers

would be selected each from the secondary schools In all, a total of one hundred and Twenty Chemistry teacher and student (120) were drawn from the ten (10)selected secondary schools in Ilorin West L.G.A.

Research Instrument

The major instrument of data collection for this study is questionnaire. A structured questionnaire with relevant items will be used to gather data for the study. Therefore the instrument will be developed by the researcher and will be titled effect of Covid-19 pandemic on chemistry students' performance in secondary school. In this regard, the questionnaire will be divided into two sections.

Section A consists of personal data of the respondent such as school, name, sex, education qualification and working experience. The section B tried to seek their opinion on the research problem which is "effect of Covid-19 pandemic on chemistry students' performance in secondary school. The responses were scored using 4 liker scale; strongly Agree (SA), Agree (A) strongly disagree (SD), and Disagree (D) respectively

Validity of the Instrument

The research instrument were given to experts in the field of measurement and evaluation, lecturers and finally the project supervisor for proper observation, screening, suggestion and correction to determine the face and content validity of the instrument

Reliability of the Instrument

To determine the reliability of the instrument, a test-re-test method was adopted by administering 20 copies of the questionnaire to students of one of the Institutions that was not part of the sampled of the study within an interval of two weeks. The questionnaire was found to be reliable at 0.05 level of significant.

Administration of the Instrument

The researcher administered the questionnaire to the selected teachers and students in each of the sampled schools after proper introduction and approval. The researcher will ensure that the entire questionnaires are properly answered and collected back on the spot for analysis.

Data Analysis Technique

Data Collected from the study were analyzed using descriptive statistics of frequency counts and simple percentage.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter deals with the presentations analysis of data obtained from the administration of the instruments (Questionnaire of the study). The data are arranged following the order of the research question that guides the study.

Analysis of Demographic Information of the Students

This section presents the results of data obtained from the respondents in percentages. The variables were gender.

Table 1:Percentage Analysis of the Distribution of Chemistry Teachers Demographic Characteristics

Variables	Frequency	Percentage (%)
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Gender	Male	46	46.00
	Female	54	54.00
	Total	100	100.0
Qualification	OND, HND	30	30.00
	BSc BA		
	NCE, BA,ED	40	40.00
	Bsc(Ed)	10	10. 00
	B.Ed	10	10. 00
	Phd. And other	10	10. 00
	Total	100	100.0
Teaching experiences	11-15 years	20	20.00
	16-19 years	65	65.00
	20 years - Above	15	15.00
	Total	100	100.0

Table 1. shows the respondents' characteristics. It can be seen that male respondents are 46 (46%) and the Female respondents are 54 (54%) which indicates that, there were more female respondents than the male respondents. Table 2 shows the respondents' characteristics. It can be seen that OND, HNDB, Sc BA respondents are 30 (30%), the NCE, BA,ED

respondents are 40 (40%), the Bsc(Ed) respondents are 10 (10%), the B.Ed respondents are 10 (10%) and the Ph.d and other, respondents are 10 (10%), which indicates that, there NCE, BA,ED the respondents shows that the Teaching experiences from 11-15 years where 20% and 16-19 years where 65% and while the remaining respondents were 15% in number which shows that the majority of them are 16-19 years were 65% respondents.

Table 2: Distribution of Chemistry Student Demographic Characteristics

Variables		Frequency	Percentage (%)
Gender	Male	46	46.00
	Female	54	54.00
	Total	100	100.0
Class	SS1		
	SS2		
Age	11-15 years	20	20.00
	16-19 years	66	66.00
	20 years - Above	14	14.00
	Total	100	100.0

Results

ANSWERING RESEARCH QUESTIONS FOR THE TEACHER

Research Question One: What are the effects of corona virus on students'

academic performance in Ilorin West LGA?

Table 3: Effect of corona virus on students academic performance

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)
1	Less interaction due to no contact between students and teachers makes learning boring	10 (50%)	5 (25%)	2 (10%)	3 (15%)
2	Students easily lose concentration	2 (10%)	11 (60%)	3 (15%)	5 (25%)
3	It is hard to teach the practical class because of social distance	8 (40%)	1 (5%)	3 (15%)	8 (40%)
4	Students are not properly assessed for covid 19	6 (30%)	3 (15%)	7 (35%)	4 (20%)
5	Time and financial implication affect students from actively participating in classroom activities	7 (35%)	6 (30%)	4 (20%)	3 (15%)

Source (Field Survey, 2024)

Table 3 above shows that 10(50%) respondents strongly agreed that less interaction due to no contact between students and teachers makes learning boring, 5(25%) respondents agreed, 2(10%) respondents disagree while 3(15%) respondents strongly disagreed. This implies that majority of the respondents strongly agreed that less interaction due to no contact

between students and teachers make learning boring.

Table 3 above shows that 2 (10%) respondents strongly agreed that Students easily lose concentration, 11(60%) respondents agreed, 3(15%) respondents disagreed while 5(25%) respondents strongly disagreed. This implies majority of the respondents agreed that Students easily lose concentration.

Table 3 above shows that 8(40%) respondents strongly agree that It is hard to teach the practical class because of social distance, 1(5%) respondents agreed, 3(15%) respondents disagreed while 8(40%) respondents strongly disagreed. This implies that majority of the respondents agree that It is hard to teach the practical class because of social distance.

Table 3 above shows that 6(30%) respondents strongly agreed that Students are not properly assessed for covid 19, 3(15%) respondents agreed, 7(35%) disagreed while 4(20%) strongly disagreed. This implies that Students are not properly assessed for covid 19.

Table 3 above shows that 7(35%) respondents strongly agreed that Time and financial implication affect students from actively participating, 6(30%) respondents agreed, 4(20%) respondents disagreed while 3(15%) respondents strongly disagreed. This implies that majority of the

respondents agreed that Time and financial implication affect students from actively participating.

Research Question Two: Does corona virus pandemic outbreak have any negative effect on students' performance in Kwara State College of Education, Ilorin

Table 4: Corona virus pandemic outbreak have negative effect on student performance

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)
1	Students are not allowed to move freely to share ideas in the class	6 (30%)	6 (30%)	3 (15%)	5 (25%)
2	Teachers teaching method are restricted	2 (10%)	7 (35%)	2 (10%)	9 (45%)
3	Lecture periods increases and in turn stress the students	6 (30%)	5 (25%)	2 (10%)	7 (35%)
4	Students do not attend class, because of infection	5 (25%)	5 (25%)	2 (10%)	8 (45%)
5	Corona virus placed on students financial burden for subscribing for data and having android phone for e-learning	3 (15%)	10 (50%)	2 (10%)	5 (25%)

Source (Field Survey, 2024)

Table 4 above shows that 6(30%) respondents strongly agreed that Students are not allowed to move freely to share ideas in the class, 6(30%) respondents agreed, 3(15%) respondents disagree while 5(25%) respondents strongly disagreed. This implies that majority of the respondents strongly agreed that Students are not allowed to move freely to share ideas in the class. Table 4 above shows that 2(10%) respondents strongly agreed that Teachers teaching method are restricted, 7(35%) respondents agreed, 2(10%) respondents disagreed 9(45%) respondents strongly disagreed. This implies majority of the respondents agreed that Teachers teaching method are restricted. Table 4 above shows that 6(30%) respondents strongly agree that Lecture periods increases and in turn stress the students, 5(25%) respondents agreed, 2(10%) respondents disagreed while 7(35%) respondents strongly disagreed. This implies that majority of the respondents agree that Lecture periods increases and in turn stress the students. Table 4 above shows that 5(25%) respondents strongly agreed that Students do not attend class, because of infection, 5(25%) respondents agreed, 2(10%) disagreed while 8(45%) strongly disagreed. This implies that Students do not attend class, because of infection. Table 4 above shows that 3(15%) respondents strongly agreed

that Corona virus placed on students financial burden for subscribing for data and having android phone for e-learning, 10(50%) respondents agreed, 2(10%) respondents disagreed while 5(25%) respondents strongly disagreed. This implies that majority of the respondents agreed that Corona virus placed on students financial burden for subscribing for data and having android phone for e-learning.

Research Question Three: What are technological therapies deployed to enhance students academic performance in Kwara State College of Education, Ilorin?

Table 5: The technological therapies deployed to enhance students academic performance

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)
1	Khanacademy.org	8 (45%)	6 (30%)	4 (20%)	2 (10%)
2	TED-Ed (ed.ted.com)	8 (40%)	6 (30%)	3 (15%)	3 (15%)
3	Codeacademy.com	7 (35%)	8 (40%)	2 (10%)	3 (15%)
4	Stanford Online (Online.stanford.edu)	5 (25%)	6 (30%)	4 (20%)	5 (25%)

5	futurelearn.com	3 (15%)	10 (50%)	3 (15%)	4 (20%)
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Source (Field Survey, 2024)

Table 5 above shows that 8(45%) respondents strongly agreed that Khanacademy.org, 6(30%) respondents agreed, 4(20%) respondents while 2(10%) respondents strongly disagreed. This implies that majority of the respondents strongly agreed that Khanacademy.org. Table 5 above shows that 8(40%) respondents strongly agreed that TED-Ed (ed.ted.com), 6(30%) respondents agreed, 3(15%) respondents disagreed 3(15%) respondents strongly disagreed. This implies majority of the respondents agreed that TED-Ed (ed.ted.com) Table 5 above shows that 7(35%) respondents strongly agree that Codeacademy.com, 8(40%) respondents agreed, 2(10%) respondents disagreed while 3(15%) respondents strongly disagreed. This implies that majority of the respondents agree that Codeacademy.com. Table 5 above shows that 5(25%) respondents strongly agreed that Stanford Online (Online.stanford.edu), 6(30%) respondents agreed, 4(20%) disagreed while 5(25%) strongly disagreed. This implies that Stanford Online (Online.stanford.edu).

Table 5 above shows that 3(15%) respondents strongly agreed that

futurelearn.com, 10(50%) respondents agreed, 3(15%) respondents disagreed 4(20%) respondents strongly disagreed. This implies that majority of the respondents agreed that futurelearn.com.

ANSWERING RESEARCH QUESTIONS FOR THE STUDENT

Research Question One What are the effects of corona virus on students' academic performance in Ilorin West LGA?

Table 6: Effect of corona virus on students academic performance

S/N	ITEMS	SA%	A%	D%	SD%
1	Less interaction due to no contact between students and teachers makes learning boring	53 (53%)	22 (22%)	18 (18%)	7 (7%)
2	Students easily lose concentration	28 (28%)	26 (26%)	30 (30%)	16 (16%)
3	It is hard to teach the practical class because of social distance	47 (47%)	21 (21%)	12 (12%)	20 (20%)
4	Students are not properly assessed for covid 19	38 (38%)	37 (37%)	16 (16%)	9 (9%)
5	Time and financial implication affect students from actively participating in classroom activities	47 (47%)	21 (21%)	10 (10%)	22 (22%)

Source (Field Survey, 2024)

Table 6 above shows that 53(53%) respondents strongly agreed that less interaction due to no contact between students and teachers makes learning boring, 22(2.2%) respondents agreed, 18(18%) respondents

disagree while 7(7%) respondents strongly disagreed. This implies that majority of the respondents strongly agreed that less interaction due to no contact between students and teachers makes learning boring.

Table 6 above shows that 28(28%) respondents strongly agreed that Students easily lose concentration, 26(26%) respondents agreed, 30(30%) respondents disagreed while 16(16%) respondents strongly disagreed. This implies majority of the respondents agreed that Students easily lose concentration.

Table 6 above shows that 47(47%) respondents strongly agree that Students are not properly assessed for covid 19, 21(21%) respondents agreed, 12(12%) respondents disagreed while 20(20%) respondents strongly disagreed. This implies that majority of the respondents agree that Students are not properly assessed for covid 19

Table 6 above shows that 38(38%) respondents strongly agreed that It is hard to teach the practical class because of social distance, 37(37%) respondents agreed, 16(16%) disagreed while 9(9%) strongly disagreed. This implies majority of the respondents agree that it is hard to teach the practical class because of social distance

Table 6 above shows that 47(47%) respondents strongly agreed that

Time and financial implication affect students from actively participating in classroom activities, 21(21%) respondents agreed, 10(10%) respondents disagreed while 22(22%) respondents strongly disagreed. This implies that majority of the respondents agreed that Time and financial implication affect students from actively participating in classroom activities

Research Question Two: Does corona virus pandemic outbreak have any negative effect on students' performance as perceived by students?

Table 7: Corona virus pandemic outbreak have negative effect on student performance

S/N	ITEMS	SA%	A%	D%	SD%
1	Students are not allowed to move freely to share ideas in the class	51 (51%)	24 (24%)	12 (12%)	13 (13%)
2	Teachers teaching method are restricted	30 (30%)	39 (39%)	13 (13%)	18 (18%)
3	Lecture periods increases and in turn stress the students	41 (41%)	25 (25%)	30 (30%)	4 (4%)
4	Students do not attend class, because of infection	38 (38%)	37 (37%)	16 (16%)	9 (9%)
5	Corona virus place on students financial burden for subscribing for data and having android phone for e-learning	47 (47%)	21 (21%)	10 (10%)	22 (22%)

Source (Field Survey, 2024)

Table 7 above shows that 51(51%) respondents strongly agreed that Students are not allowed to move freely to share ideas in the class, 24(24%) respondents agreed, 12(12%) respondents while 13(13%) respondents strongly disagreed. This implies that majority of the respondents strongly agreed that Students are not allowed to move freely to share ideas in the class

Table 7 above shows that 30(30%) respondents strongly agreed that Teachers teaching method are restricted, 39(29%) respondents agreed, 13(18%) respondents disagreed while 16(16%) respondents strongly disagreed. This implies majority of the respondents agreed that Teachers teaching method are restricted

Table 7 above shows that 47(47%) respondents strongly agreed that Lecture periods increases and in turn stress the students agreed, 30(30%) respondents disagreed while 4(4%) respondents strongly disagreed. This implies that majority of the respondents agreed that Lecture periods increases and in turn stress the students

Table 7 above shows that 38(38%) respondents strongly agreed that Students do not attend class, because of infection 37(37%) respondents agreed, 16(16%) disagreed while 9(9%) strongly disagreed. This implies

majority of the respondents agree Students do not attend class, because of infection.

Table 7 above shows that 41(41%) respondents strongly agree Corona virus place on students financial burden for subscribing for data and having android phone for e-learning, 21(21%) respondents agreed, 12(12%) respondents disagreed while 20(20%) respondents strongly disagreed. This implies that majority of the respondents agree that Corona virus place on students financial burden for subscribing for data and having android phone for e-learning.

Research Question Three: What are technological therapies deployed to enhance students academic performance on academic performance of students.

Table 8: The technological therapies deployed to enhance students academic performance

S/N	ITEMS	SA%	A%	D%	SD%
1	Khanacademy.org	51 (51%)	24 (24%)	12 (12%)	13 (13%)
2	TED-Ed (ed.ted.com)	30 (30%)	39 (39%)	13 (13%)	18 (18%)
3	Codeacademy.com	41 (41%)	25 (25%)	30 (30%)	4 (4%)
4	Stanford (Online.stanford.edu) Online	38	37	16	9

		(38%)	(37%)	(16%)	(9%)
5	futurelearn.com	47	21	10	22
		(47%)	(21%)	(10%)	(22%)

Source (Field Survey, 2024)

Table 8 above shows that 51(51%) respondents strongly agreed that Khanacademy.org , 24(24%) respondents agreed, 12(12%) respondents while 13(13%) respondents strongly disagreed. This implies that majority of the respondents strongly agreed that Khanacademy.org

Table 8 above shows that 30(30%) respondents strongly agreed that TED-Ed (ed.ted.com), 39(29%) respondents agreed, 13(18%) respondents disagreed while 16(16%) respondents strongly disagreed. This implies majority of the respondents agreed that TED-Ed (ed.ted.com)

Table 8 above shows that 47(47%) respondents strongly agreed that Codeacademy.com agreed, 30(30%) respondents disagreed while 4(4%) respondents strongly disagreed. This implies that majority of the respondents agreed that Codeacademy.com

Table 8 above shows that 38(38%) respondents strongly agreed that Stanford Online (Online.stanford.edu)37(37%) respondents agreed, 16(16%) disagreed while 9(9%) strongly disagreed. This implies majority of the respondents agree Stanford Online (Online.stanford.edu).

Table 8 above shows that 41(41%) respondents strongly agree futurelearn.com, 21(21%) respondents agreed, 12(12%) respondents disagreed while 20(20%) respondents strongly disagreed. This implies that majority of the respondents agree that futurelearn.com

Hypotheses Testing

The following hypotheses were tested using chi-square goodness of fit to find out availability, adequacy and usability of instructional material as pedagogical catalyst in chemistry in Ilorin West local government area Kwara State.

Research Hypothesis 1: There is no significant relationship between the effect of corona virus and Chemistry student's academic performance in Ilorin West Local Government Area.

Table 9: Chi-square test of the mean ratings of teachers and Student corona virus and Chemistry student's academic performance in Ilorin West Local Government Area.

Table 9: The teachers and Student corona virus and Chemistry student's academic performance

Response	O	E	DF	X^2_{cal}	X^2_{tab}	Sig.	Remark
SA	463	100	27	129.840	40.11	0.05	Accepted
A	414	100					
D	72	100					
SD	51	100					

Source: field survey, 2024

In the table above, the calculated chi-square value of 129.840 is greater than the critical value of 40.11 at 0.05 level of significance with 27

as the degree of freedom. The null hypothesis is accepted thereby accepting the alternative hypothesis which implies that the mean ratings of teachers and Student corona virus and Chemistry student's academic performance in Ilorin West Local Government Area

Hypothesis Two: There is no significant relationship between corona virus pandemic outbreak and Chemistry students' academic performance in Ilorin West Local Government Area

Table 10: Chi-square test of the mean ratings of teachers and student corona virus pandemic outbreak and Chemistry students' academic performance in Ilorin West Local Government Area.

Table 10: The teachers and student corona virus pandemic outbreak and Chemistry students' academic performance

Response	O	E	DF	χ^2_{cal}	χ^2_{tab}	Sig.	Remark
SA	406	100	27	189.570	40.11	0.05	Accepted
A	473	100					
D	72	100					
SD	49	100					

In the table above, the chi-square calculated value of 189.570 is greater than the critical value of 40.11 with 27 as the degree of freedom, at 0.05 level of significance. The null hypothesis is therefore accepted and the alternative hypothesis accepted implying therefore that, the mean ratings of teachers and student corona virus pandemic outbreak and Chemistry students' academic performance in Ilorin West Local Government Area.

Research Hypothesis Three: There is no significant relationship between

technological therapy employed and Chemistry students' academic performance in Ilorin West Local Government Area

Table 11: Chi-square test of the technological therapy employed and Chemistry students' academic performance in Ilorin West Local Government Area

Response	O	E	DF	χ^2_{cal}	χ^2_{tab}	Sig.	Remark
SA	394	100	27 Accepted	85.323	40.11	0.05	
A	435	100					
D	121	100					
SD	50	100					

Source: field survey, 2024

In the table above, the calculated chi-square value of 85.323 is greater than the critical value of 40.11 at 0.05 level of significance with 27 as the degree of freedom. The null hypothesis is accepted thereby accepting the alternative hypothesis which implies that technological therapy employed and Chemistry students' academic performance in Ilorin West Local Government Area

DISCUSSION

The findings on research question 1 proved that the respondents accepted the statement that students are not allowed to move freely in order to share ideas in the class, methods of teaching to be used by teachers are restricted, lecture periods increases and in turn stress the students, students do not attend class, because of infection, corona virus

placed on students financial burden to be able to be taught by subscribing for data and having android phone that can carry out the command. This finding is in agreement with the views of Wikipedia (2020) that corona virus pandemic affected educational systems worldwide, leading to the widespread closures of schools. The finding also agrees with Quentin (2014) who revealed that 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.

The findings on research question 2 also proved that the respondents agreed with the statement that students are not allowed to move freely in order to share ideas in the class, methods of teaching to be used by teachers are restricted, lecture periods increases and in turn stress the students, students do not attend class, because of infection, corona virus placed on students financial burden to be able to be taught by subscribing for data and having android phone that can carry out the command. This finding is in agreement with the view Abullahi. (2020) who

revealed that students were not able to be evaluated effectively by teachers on what has been taught for those that are privilege to have access to internet facilities, students complain of time factors, disruption of internet facility network and consciousness of the financial implication while those that are not privilege to have access to internet facilities lagged behind, because they could not afford what it takes to learn via internet this in turn hampered their academic achievement

The findings on research question 3 further shows that the respondents agreed Khanacademy.org, TED-Ed (ed.ted.com), Codeacademy.com, Stanford Online (Online.stanford.edu) and futurelearn.com are technological therapies deployed to enhance students' academic performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The study was conducted to identify effect of covid 19 pandemic on Chemistry students' academic performance in Ilorin West Local Government; information was collected by means of questionnaire from effect of covid 19 pandemic on Chemistry students' academic performance in Ilorin West Local Government students. The purpose of the study were to explain the effect of covid 19 pandemic on Chemistry students' academic performance in Ilorin metropolis Ascertain the effect of school closure on teaching and learning activities in Ilorin metropolis. And to determine the technological therapy deployed to enhance students academic performance in Ilorin West Local Government.

Literature reviewed highlighted the overview of coronavirus, global responses to coronavirus pandemic, impact of coronavirus pandemic on academic achievement of students, effects of coronavirus on teaching and learning situations, technological therapy for coronavirus school closures, challenges of Covid 19 on students academic achievement, social distancing barrier to it implementation in the class, virtual class adapted

during Covid 19 break and appraisal of literature reviewed

Descriptive survey design was used in carrying out the study. The sample size for the study was one hundred and eighty respondents randomly selected from the effect of covid 19 pandemic on Chemistry students' academic performance in Ilorin metropolis. The data collected were analyzed using frequency and mean

Conclusion

It is clear that Ilorin West, students were frustrated and their academic achievements have been badly affected. In fact, all levels are plagued with Covi-19. Schools were closed, students could not be taught, students could not be assessed and also students are idle due to the limitation of on line education.

Finally, students that have learning difficulties could not be helped, lack of face to face interaction frustrate teaching and learning situations and also unequal access to digital learning partially frustrate the academic achievement of students

Recommendations

In line with the findings, practical implications and conclusions of this study the following recommendations were made by the researcher:

Government should put more effort to train and re-train teachers in e-learning communication.

Ministry of tertiary Education should organize workshops, seminars and conferences for teachers and students to retain their knowledge on the advent of online learning for teachers and students.

The school administrators should devise means of motivating teachers and students towards proper using different uses of e-learning attractive to Chemistry students in tertiary institutions.

Government at all levels should endeavour that the e-learning, educational palliative should serve the learners both in rural and urban area.

Government should give periodic in-service training to teachers in tertiary institution on the different ICT strategies that will serve learners in urban and rural areas in the online teaching and learning process.

Stakeholders should demonstrate cooperate social responsibility by providing e-learning facility to compliment government effort.

The Implication for Further Studies

This study has been able to establish the possible effect of COVID-19 on SS3 students who are going to write West Africa Senior Secondary Certificate Examination (WASSCE) this year. It is believed that the result of

this study will assist other researchers to investigate other possible issues or areas of interest where COVID-19 might have a damaging effect on the students' ability to learn. Also, this study explained the teachers' opinions and concerns regarding the forthcoming examination which has been postponed until further notice. If COVID-19 pandemic prolongs more than necessary, it could have a deleterious ripple effect on the educational system in Nigeria. Thus, all essential measures should be in place to flatten the curve quickly. As we look up to reopening of our schools very soon, we, therefore, call on the relevant government authority to kindly fund the educational system in Nigeria and also provide necessary types of equipment and tools. Teachers and Students should also be trained to familiarize and equip them with what it takes to teach and learn using innovative strategies in this new era.. With this in place, it is believed that we can achieve optimum students' achievement in both internal and external examinations. As part of COVID-19 relief package, recommendations are made to the Federal government of Nigeria and policymakers to distribute IPads and electronic tablets preloaded with e-textbooks in these subject areas to SS3 students' and their teachers' in order to facilitate online learning as this will enhance their achievement in

Science subjects in this year's national examination.

Limitation of the Study

During the cost of this research, these many problems among them are:

Time factor: the time was not enough for me because of the cumbersome of load of work and my personal challenge. Inadequate finance; There is no enough ware withal to embark on the research. Both in transportation to the various places and typing and photocopying the research questions.

Lack of material to facilitate a better research; COVID-19 is the latest and correct predicament that solution have not yet been given to it or no proper articles to justify the program and many researchers have not write a relevant data on it.

Suggestion for further Study:

The extensive research recommended for further reading was carried out on Effect of Covid 19 Pandemic On Chemistry Students' Academic Performance In Ilorin Metropolis. This researches is limited to secondary school in Ilorin Metropolis faculties dues to time allotted to the project and the cost implication in few selected faculties in Ilorin Metropolis. Since the project is limited to secondary school there is need for further research to

broaden the scope and coverage of this study to make it representative enough generalization.

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APPENDIX
KWARA STATE COLLEGE OF EDUCATION
P.M.B 1527 ILORIN
DEPARTMENT OF CHEMISTRY
SCIENCE, SCHOOL OF SCIENCE
QUESTIONNAIRE EFFECT OF COVID 19 PANDEMIC ON CHEMISTRY
STUDENTS' ACADEMIC PERFORMANCE IN ILORIN METROPOLIS

Dear Respondent,

The purpose of this questionnaire is to collect data for my research work titled "Effect of covid 19 pandemic on academic performance of students in Ilorin Metropolis".

Your sincere response to the questions will be highly appreciated and every information will be given a confidential treatment.

Yours sincerely,

SECTION A: Fill the gaps with your information

Name of school: _____

Sex: Male () Female ()

Educational Qualification: OND, HND, Bsc, BA () NCE, BA. ED () Bsc (Ed) () B.Ed () Ph.D and other ()

Years Teaching Experience: 1-10 yrs () 11-19 yrs () 20 years and above ()

SECTION B:

Tick () any of the 4-points rating scale to indicate your level of agreement:
 4-points scale- (SA) – strongly Agree (A)- Agree (D) – Disagree (SD) – Strongly disagree

A	What are the effects of corona virus on students' academic performance on academic performance of students in Ilorin Metropolis?	SA	A	D	SD
1	Less interaction due to no contact between students and teachers makes learning boring				

2	Students easily lose concentration				
3	It is hard to teach the practical class because of social distance				
4	Students are not properly assessed for covid 19				
5	Time and financial implication affect students from actively participating in classroom activities				
B	Does corona virus pandemic outbreak have any negative effect on students' performance on academic performance of students in Ilorin Metropolis	SA	A	D	SD
6	Students are not allowed to move freely to share ideas in the class				
7	Teachers teaching method are restricted				
8	Lecture periods increases and in turn stress the students				
9	Students do not attend class, because of infection				
10	Corona virus placed on students financial burden for subscribing for data and having android phone for e-learning				
C	What are technological therapies deployed to enhance students academic performance on academic performance of students in Ilorin Metropolis? The following are the technological therapies deployed to enhance	SA	A	D	SD

	students academic performance				
11	Khanacademy.org				
12	TED-Ed (ed.ted.com)				
13	Codeacademy.com				
14	Stanford Online (Online.stanford.edu)				
15	futurelearn.com				