

**Digital Teachers' Competence, Virtual Classroom Management and Secondary
Schools Students' Attitude Towards Learning in COVID-19 Era, Lagos State**

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**Being a PhD Thesis Submitted to the Department of Arts and Social Science Education,
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**In Partial Fulfillment of the Requirements for the Award of Doctor of Philosophy
Degree (PhD) in Educational Management**

2023

Certification

I certify that Julianah Oladunni FALORE with matriculation number LCU/PG/001950 carried out this research work titled ‘‘Digital Teachers Competence, Virtual Classroom Management and Secondary School Students Attitude Towards Learning in COVID-19 Era, Lagos State’’ in the Department of Educational Management, Faculty of Arts and Education, Lead City University, Ibadan, Nigeria for the award of Doctor of Philosophy Degree (Ph. D) in Educational Management.

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Dedication

This research work is dedicated to God Almighty

Do Not Copy, Lead City University, Nigeria

Acknowledgement

Much appreciation goes to Lead City University, Ibadan for letting me follow my academic dream of adding to the body of knowledge.

The researcher appreciates her supervisor Prof. Afolakemi Oredein the Provost, Postgraduate College Lead City University, Ibadan for her guidance and never - ending relationship. Her straight forward but blatant constructive criticism of my work demonstrates her modest research philosophy. Also, I am grateful to the Dean of the Faculty of Arts and Education, Lead City University, Prof. Doland Odeleye for the encouraging remarks and fatherly love displayed during the program. To Prof. Senimetu lleuma, (Head of Department) Educational Management, Faculty of Education Lead City University, Ibadan for her words of encouragements and other lecturers in the faculty of Arts & Education, Lead City University, Ibadan for their supportive roles. I am grateful to Prof Phillias Yara, Drs: Toyin Oyedeji, Monilola Oyetade, Ukamaka Akuche, Oluyomi Pitan, Sam-Christianah Kayode, Sabina Obi, Olabisi Killian, Mojirade Ayantunji, Adeyemi Ebo, Omobola Gambo, Seyi David, Deborah Ayeni, Miss Dolapo Awoniyi, Mr Moyosore Beckley, and Mr Oluwaferanmi Adejuwon. My thanks go to Dr Olujinmi Odeniyi and Dr Bankole Adeyemi for their immense guidance, encouragements and words of wisdom.

I cannot begin to tell my loved ones of how much I appreciate them for assisting me: my former colleagues at the National Examinations Council in Lagos and Ogun States respectively. Without the confidence and stimulation of my cherished family members, and friends, I would not have progressed to this point. Words cannot adequately describe my thanks to them

“Although the institution and persons listed in the research process provided support, I alone, am responsible for any errors that may have been made.”

Abstract

The COVID-19 pandemic has significantly impacted Nigeria's secondary education, prompting a shift to virtual learning. This study examines the influence of digital teacher competence and virtual classroom management on secondary school students' attitudes during the pandemic Era. The study was anchored by Connectivism and Technological Pedagogical Content Knowledge (TPACK) theories. Using a descriptive survey design, the study employed multi-stage sampling procedure using simple random sampling technique to select a representative sample size of 1435 teachers and 1595 students respectively 935(65.9%) and 1495(91.7%) were retrieved. Data collection involved structured questionnaires and interviews, yielding quantitative and qualitative data for analysis. Descriptive statistics of simple percentages, mean and frequency was used to answer research questions while inferential statistics of multiple regression analysis (ANOVA) was used to test formulated hypotheses. Students displayed commendable adaptability, determination, and dedication to learning throughout and after the pandemic (mean = 3.44). Digital teacher competence remained high during and after the COVID-19 Era (mean = 3.38 and mean = 2.79, respectively). WhatsApp was the predominant virtual classroom platform during the pandemic, later supplanted by Zoom. Challenges included poor internet access for students and irregular power supply for teachers. However, both students and teachers demonstrated high compliance with virtual teaching rules during and after the pandemic. Furthermore, the study unveiled a significant combined influence of digital teacher competence, virtual classroom management on student attitudes ($R^2 = 0.707$, $p < 0.05$). Virtual classroom management made a substantial contribution ($t = 29.777$, $p < 0.05$), with directing having the highest influence ($t = 19.071$; $p < 0.05$). In conclusion, Lagos State secondary students exhibited remarkable resilience, commitment, and a growth-oriented mindset amid various challenges during and after the COVID-19 Era. To leverage these findings, it was recommended among others that educational institutions integrate online learning tools effectively into their curricula and undertake additional measures to enhance the learning experience.

Keywords: Digital teachers' competence, Virtual classroom management practices, Students' attitudes toward learning during the COVID-19 Era.

Wordcount: 292

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List of Acronyms

Abbreviation

Meaning

COVID	Coronavirus Disease
WHO	World Health Organization
FME	Federal Ministry of Education
UNESCO	United Nation Educational, Scientific and Cultural Organization
SSCE	Senior School Certificate Examinations
NECO	National Examinations Council
WAEC	West African Examination Council
NABTEB	National Business and Technical Examination Board
JSS	Junior Secondary School
SSS	Senior Secondary School
NPE	National Policy on Education
LGEA	Local Government Education Authority

Chapter One

Introduction

1.1 Background to the Study

Education is an enlightenment process that involves sharing of knowledge and learning from others. The procedure improves a person's skills, which aids in both individual growth and societal advancement. Thus, education is an activity, a methodology, a recipe, a way that improves the situation and equips one with skills necessary for self-improvement. It is a reformation process that increases students understanding of their rights, foster growth, and promotes development. Education is therefore a necessity that is desired by most human beings because of its importance and utility to the beneficiaries and society.

Education is a lifelong process involving teaching and learning methods in schools, passed down from generation to generation. Thus, education allows students to make more conscious progress towards being able to operate in society, suggest ideas, and become skilled employers of labour. Education is often regarded as the global cornerstone for the individual and national ground. Every child has the right to education as stated in the National Policy on Education, regardless of their location or their social, economic, physical circumstances¹. Individual variance depending on background, environment, social standing and exposure will have diverse attitudes towards learning while taking into account the right to education for every child. The conduct a child exhibits in response to events could be referred to as their attitude.

There is a long relationship between education and attitude. Education is the key factor through which a nation can progress, positivity toward learning is the first step towards being an effective learner. A positive outlook helps unwind, remember, concentrate, absorb information, welcome new experiences and see a variety of learning opportunities. Those who want to acquire formal education must have positive attitude to learning. Every human being has a certain attitude towards their actions in one way or the other. A learner's mindset has a big impact on their ability to learn. Students with positive attitude convert challenges into opportunities, pay attention to the teachers and be delighted for others' successes while students with negative attitudes makes teaching rigorous and difficult for teachers. Attitude is any strong belief, feelings, acceptance, or rejection of persons or situations, it also refers to how one feels about something.

Diverse people have different perspectives on the same thing or concept. While some perceive the usage of the internet by students as beneficial because they believe it aids academic success, others see it negatively because they believe it exposes students to immoral things. While a student who disobeys the teachers' instructions demonstrates a poor attitude towards learning, a student who obeys the teachers' orders has shown to have a good attitude about learning. Good result comes from having a positive attitude, thus, making things simpler and more pleasurable, gives one the confidence to face challenges head-on with wisdom, and inspires one with the idea that victory will be earned. Attitude could also be the tendency of a person to respond positively or negatively towards an object or situation, which can be formed through positive association between students and teachers, being rewarded or punished, observing others, cultural norms and exposure to information. Hence, it can be deduced that attitude is learned and not inherited. When our self-concept, self-worth, self-esteem and sense of significance are integrated, it naturally results in our attitude which is our way of thinking. Attitude is the outward expression

of individual true nature². The way individual reacts to the present and the quality of one's future are both influenced by individual attitude. Attitude determines who you are and how you act.

Psychologists define attitude as the natural tendency to evaluate things in a particular way which can be good or bad, positive or negative, people do love, hate, like, dislike, favour, agree, or disagree on a daily basis². Attitude significantly impacts students' being highly motivated and engaged thus, seeking challenges, asking questions to extend thinking approaches, learning with active interest, seek own solution to problems, organizing time effectively, sets as an example, takes responsibility, connects ideas, shows a desire to improve, show kindness and listen carefully. Students more enthused about their studies are more likely to succeed and have critical thinking abilities³. Individual attitudes can influence one's thoughts, feelings, and actions in reaction to a circumstance; as a result, students are expected to act consistently towards a person, objects, and events.

However, while some attitudes are formed due to knowledge, understanding, talents, others are cultivated. Attitude is part of life, but how students react to it is their choice. Teachers must figure out how to work with students who exhibit positive or negative attitudes. Students are to be encouraged to make decisions that will have a positive outlook. Many in the past missed out on wonderful chances, maintaining an optimistic outlook on life's challenges to have a positive attitude to life. Many factors have been identified in the literature that affect students' attitude towards learning; instructional methods, teaching aids, classroom environment, gender, teachers' behaviours, curriculum relevance, environmental factors (parents, peers, friends, social-economic class and social-cultural context)⁴. Similarly, the teachers' teaching methods, personalities and his relationship can influence students' attitude. Students' behaviour can be changed if teachers exhibit honesty, commitment, sincerity, reliability and accessibility. For a

student to have a positive attitude towards learning, he is to exhibit traits such as readiness, patience and self-confidence. A scholar viewed parents' educational background in providing tools for the virtual classroom teaching, beliefs, feelings, unstable sound and visual quality as some of the factors that affect student attitude towards learning². Attitude is thus, described as an individual's mental state, which makes him react in a predetermined way. Students who have a positive outlook on life are better equipped to comprehend their surroundings and maintain consistency in their ideas and thought processes. Additionally, it aids students in social engagement, self-expression, and minimizing advantages and disadvantages while dealing with another peer group.

Furthermore, psychologists identified three components of attitude; cognitive, affective and behavioural. Cognitive consists of an individual's thoughts, beliefs, values, and ideas about something. It is part of the attitude that is related to the general knowledge of a person and the preserved usefulness of what is learnt, emotions are feelings of enjoyment in learning a particular thing. It may be seen as boring or dull. Belief is confidence in learning, while vision represents one's perception of learning. Affective is the positive or negative feelings towards issues, events or objects. Behaviour deals with individuals acting in a certain way. It is connected to motivation, reflecting students' actions, commitment and performance in class⁵. Each of these components differs from others; they can be a build-up to form students' attitude which may adversely affect how we relate to the world.

Attitude has many types and each type influences the behaviour of the people. A researcher identified four types of attitudes as being exhibited by students. A positive attitude keeps the work moving and progressing, looks for the good in others, is confident, happy, cheerful and

determined, flexible in their approach, reliable, tolerant, motivate, ready to welcome new experiences, recognize many different kinds of learning activities and goal-getter. A positive attitude can be developed in students by showing empathy, looking at the positive side of life, and being respectful and responsible. Students with a positive attitude will always find ways to learn despite the closure of schools. They took the advantage of the resources and chances made available by both private citizens and the state to study via; radio, television, WhatsApp, Google meet or zoom. Teachers' efforts are needed to build a positive attitude, this can be done if teachers make their lessons enjoyable, give attention to students and give in their best in the teaching-learning process⁶. To become a great learner, students are to have a positive mindset, the ability to decompress, recall information rapidly, and the ability to learn from past mistakes.

However, people with negative attitude overlook nice individuals and concentrate on the negative; they complain about changes rather than a finding solution, they are pessimistic, resentful of others accomplishments, depressed about and enraged all the time. Thus, negative attitude holds students back of their true potentials. Neutral attitude waits for others' intervention regarding challenges, self-satisfied and complacent. With neutral attitudes, students remain unbalanced in their approach to life. They sit on the fence and do not use the opportunities available. The silken attitude students are destructive always look for opportunities to destroy learning tools available instead of utilizing them for learning when provided⁶. Attitude can either define or destroy an individual. One's attitude should serve as an example for others to follow, students who frequently interact with those who have a positive attitude can benefit from this in their academic pursuits. On the other hand, a bad attitude prevents learning outcomes, and has a detrimental impact on academic success.

The above has shown that learning can be affected in no small measure by attitude. Learning is the process of a person's constant transformation which is viewed as a collection of knowledge that has been applied. It can also be described as the ability to develop new information from a new situation by applying the existing knowledge through desire, openness and expectations³. A wide variety of teaching and learning techniques that involves students as active participants in their learning include individualized feedback, collaborative learning, formative assessment and academic engagement each student is involved individually, this is referred to as student-centred learning in virtual classroom teaching. It is assumed that a student eagerness to learn has a positive attitude towards learning, which will help increase their understanding of the nature of learning. Low learning expectations will limit students' motivation, thus having a negative attitude toward learning.

To measure the student's attitude towards learning, the indicators to be used in this study are; readiness, self –discipline and patience. Readiness is the ability of an individual to participate in the learning process and takes responsibility for what they have learnt or propensity to learn new things and take part in the behaviour change It connotes students' preparedness for the virtual classroom; which include the digital devices available for use by the students, environmental factors, ability to follow instructions and active class participation. Readiness of students entails technical proficiency, self-assurance and participation in self-directed learning. Therefore, readiness can be viewed as the level of effectiveness or an acceptance of online learning. However, teachers' needs to consider when students are ready in relation to the learning objectives and plan the lesson experiences beyond the skill level of each student. The way a

teacher gets students ready to perform a certain task might be characterized as readiness. When parents pay attention to their wards physical, emotional, social, language and cognitive development, it will assist their wards to develop a willing attitude, confidence in the learning process and a healthy state of mind. Readiness can also be described as the capacity of students to take in new knowledge and process it in a way that leads to desired academic goals. In order for students to learn effectively, readiness is not the only essential attribute but also patience must be incorporated.

Similarly, patience is the capacity to wait calmly to complete a task with consistency, endurance and perseverance. It breeds self-assurance and decisiveness, produces a calm, communicative style that motivates others to assist rather than withdraw. It thus enables students to react to a specific effect, when necessary, collaborate with others, and understand life from the perspectives of others. It is also the capacity to remain calm, smile and stay attentive when dealing with a difficult or frustrating situation with other students. Students do not naturally possess patience, instead, they actively practice it. To inculcate patience in students, teachers must be committed, not giving up on students, be mindful of their body language, observe and mentor them as they strive for greatness in their chosen field. Students' who are more likely to make wise decisions, develop tolerance and other virtues, persevere and treat others with respect, developing new talents, concentrating on long-term objectives and aspirations and helping students to feel at ease. However, impatience is usually harmful, constantly waiting to speak, and can cause students to act irrationally, resulting in a negative attitude to learning.

The importance of discipline in the affairs of human beings cannot be over-emphasised. Discipline means doing the right thing at the right time. Self-discipline is the determination of students doing what needs to be done when it needs to be done. It could further be described as a practice, a habit and an ability to comprehend the crucial elements in each person's behaviour. Success requires perseverance in the face of setbacks and losses, as well as the ability to resist temptation and stay focused. Students who are self-disciplined will be able to select and stick with actions, attitudes and behaviours that lead to success and improvement as well as having the power and inner fortitude to overcome addictions and laziness. To be self-disciplined, a student must use time wisely in terms of the assignment and homework given, stay organized, choose a proper study location that is comfortable and quiet, avoid distractions and participate in class discussions to improve communication skills. These, will boost self-esteem, inner strength happiness and satisfaction inadequate self-control could result in academic failure. Teachers must build positive relationship with students in order to foster a stable attachment, understand how to communicate efficiently with them while guiding them, established clear norms, rewarding them for handwork and give students the ability to express their preferences. To achieve one's goals, students need to exercise self-control, get organized, ask questions, stay resilient, and explore new ideas to advance confidently.

The only thing that is permanent in life is change. Year 2020 will be remembered as the year, that the globe was forced to adopt online learning due to Coronavirus Disease (COVID- 19) pandemic. The online tactics became a way to fill the vacuum left by school closures, which forced students to stay at home with their parents and guardians. The concept of e-learning has been broadened to incorporate several online learning modalities such as conferencing, blended learning, and attending virtual classes to keep learning ongoing during the pandemic⁷ Virtual

classroom is a digital learning environment that allows teachers and students to connect online in real time thus allowing for good communication, collaboration, cooperation and skill acquisition between teachers and students; however, the majority of students seem to be less apprehensive than in face-to-face teaching; they display anxiety and exhibited fear due to the digital technology tools used in a virtual classroom.

Severe acute respiratory syndrome Coronavirus 2 (SARS COV -2) also known as Coronavirus is the virus that caused COVID-19. It was declared a global pandemic by World Health Organization (WHO) on the 11th of March 2020 following the discovery of the epidemic which started in Wuhan, Hubei, China in December 2019, spreading worldwide within a few months of discovery.

At the second meeting of the International Health Organization Regulation Emergency Committee regarding the outbreak of the Novel Corona Virus it was stated that:

*"In the past two weeks the number of cases of COVID-19 Outside China has increased 13-fold and the number of affected countries had tripled. There are more than 11,800 Cases in 114 countries, and 4219 people have lost their lives We have therefore assessed that COVID-19 can be characterized as a pandemic"*⁷

The virus would be with us for a very long period, people were warned. Every patient must be found, isolated, tested, tracked down, and every contact must be quarantined. Additionally, individuals must be inventive and open to learning⁸. The public is to take responsive care in terms of hand washing, wearing facemasks ensuring distance from someone coughing or sneezing and avoiding mass assemblies

A number of countries adopted extra precautions to prevent the pandemic's spread after receiving advice and updates on how to do so. In response, Saudi Arabia closed all of its schools and started using television and the internet to provide instructional materials⁹. Early action was also

taken in South Africa, where a state of emergency was declared to enclose the community change. Italy started with the most affected regions in order to stem the spread

The Federal Ministry of Health confirmed a Coronavirus disease (COVID -19) case in Lagos State on the 27th of February 2020. The case was an Italian Citizen who worked in Nigeria and returned from Italy to Lagos. Thus, in line with the World Health Organization (WHO) directives, the Federal Government of Nigeria, through the Federal Ministry of Education (FME), ordered the closure of all schools from primary to Tertiary institutions as a precautionary move aimed at curtailing the spread of the Coronavirus (COVID-19) disease in the country on the 19th of March 2020¹⁰ As of April 2020, United Nations Educational, Scientific and Cultural Organization (UNESCO) monitoring report revealed that about 1.723 billion learners had been affected due to the sudden closure of schools. It also revealed that 191 countries had complied nationwide closure of schools. The closure of schools does not only affect the education sector, and it affects health and socio-economy. Public gatherings were suspended, malls and marketplaces closed down, and religious organizations were streamlined regarding the numbers and ages that could attend religious functions. COVID -19 brought a dramatic change in the entire educational and economic system in the world¹¹. Education was grounded most especially in the developing countries that are not exposed to digitalization, educational institutions in developed countries adapted to the use of entire teaching.

In Nigeria, education was grounded; teachers and administrators were unprepared for the transition from face-to-face teaching and learning to virtual classroom teaching. The Federal Ministry of Education was very slow to adapt immediately due to the digital gadgets needed to operate virtual classes. States Ministry of Education was forced to build an emergency learning

system. Teachers had to deal with much more than merely accepting their assigned responsibilities, as the COVID-19 outbreak demonstrated. The instructional goals had to be changed and teachers had to modify lessons unit plans. Without using lesson plans or textbooks that were unavailable due to enforced lockdowns, they were introduced to the realm of virtual learning. Teachers were compelled to compete with the digital transformation of resources quickly, however, the process of searching for a program online that met their demands took a lot of time and effort. Many students in the public schools and less expensive private schools struggled to access digital tools¹². Through the state ministry of education, the Lagos state government provided Radio and Television programs to teach students in public secondary schools. However, schools in the rural areas were behind due to a lack of electricity supply to such communities.

Several arguments were put up against online teaching. Learning from home could be a challenge due to distraction from family members and the environment since it all depends on parental involvement, depression, stress, anxiety, isolation due to lack of contact with the school, most especially the aspect of relating with the school counsellor, emotional and social support been provided by the school were not available, students missing classes due to home chores, widespread digitalization, increased unsupervised on-line internet use which has allowed issues around sexual exploitation and cyber –bullying¹⁰. However, it must be noted that digital technology is increasingly recognized as an indispensable tool for student's right to education since it provides recreational activities, social support and facilitates social interaction among students. The closure of schools as a result of the COVID-19 pandemic had a significant impact on institutions, educators, administrators, teachers, parents and students due to the unforeseen

pandemic which they were not prepared for¹³. This development brought about the introduction of virtual classroom teaching for students to continue their academic sessions, which has exposed the precarious state of Nigeria's educational system.

Virtual classroom is an online learning and teaching environments where teachers and students collaborate, and use learning tools to communicate, discuss presentations. It enables students to access quality teaching anywhere in the globe as long as there is an internet connection. Some of the virtual classroom platforms used include; WhatsApp, goggle meet, zoom, telegram, chats, radio and television. The lockdown period forced schools to cancel regular classes, periodical tests, assignments, projects etc. and switch to online; teachers, students, and parents were confused initially and did not understand the action to take, but after a while, they realized they needed to change to on-line¹⁴. Teachers, most especially in private schools in Lagos, created and use WhatsApp group, zoom classes, goggle meet and telegram which provided a recording feature used by students to review past lessons taught. Radio and Television broadcasting were also introduced by the Lagos state government. Today we are in the era of e-learning; teachers, students and parents keyed into it to reflect students' academic performance positively.

The introduction of a virtual classroom platforms is seen as an option rather than a substitute for traditional classroom learning; it became a necessary component of educational activities during the COVID-19 Era; students' attitudes about learning changed as a result of this paradigm shift and their perception also differs from those discovered in research conducted prior to the pandemic. Virtual classroom platforms offer several advantages to learners, students can learn at their own pace, sharpens their digital skills, collaborating with other students, and helps students

to absorb knowledge. Thus, the process may be modified to learners according to their requirements and learning objectives¹⁵. Despite the inherent limitations posed by this moment of crisis, virtual classroom helps in improving students' effective learning and communication skills.

In a virtual classroom, the activities involve fostering a supportive environment, maintaining discipline, controlling students' involvement, planning, and organizing are all embedded in the virtual classroom learning. However, management of the learning process adjust to changes owing to the demands of the virtual classroom which includes time, monitoring student's space, communication and interaction among teachers and students, smaller group and individual, thus, virtual classroom management is the process that involves learning that is supported by technology¹⁶ to achieve stated objectives which involve the tactics teachers use to ensure independency and collaboration of working with the students.

Virtual classroom management refers to the set of strategies, techniques, and tools employed by educator and institutions to facilitate a smooth and productive learning experience in the virtual setting¹⁷. It encompasses various aspects, such as maintaining learner engagement, fostering collaboration among students, addressing technical challenges and promoting an inclusive and equitable learning environment. It is now the fundamental method of instruction for which the teacher has the majority of responsibility. The teacher should be able to effectively managing teaching and learning by implementing strategies to make sure that lessons go smoothly and to promote student's independence. Thus, virtual classroom management requires controlling student's behaviour, upholding civility, maintaining orders, and retain their attention span. The indices for virtual classroom management include planning, directing, and organizing. Planning

involves things to be done and the methods of doing it, teaching students how to behave in a way that is best for them and their learning is part of planning. It requires precision, delineation, demonstrability, practice, and directing students towards positive behavioural outcomes. A thorough virtual classroom learning strategy aids in encouraging students' engagement and retention, a clear purpose that incorporates Google videos and diagrams, assignments that assesses students based on what they have learned, and other teaching strategies are necessary to keep students' attention throughout the virtual classroom learning, and regularly reminding the students about the rules and expectation.

Directing is a continuous task of making certain decisions, encompassing general orders and instructions in a virtual classroom. The teacher directs and encourages students to participate through effective communication, collaboration, and establishes the rules to abide with, show students step by steps ranging from how to use and access the tools so that they can see the benefits of virtual classroom learning modalities.

Organizing is putting ideas into action and by establishing a system of authority. As a result, expectations are set for students' behaviours in virtual classroom, although they spend longer in a well-organized virtual classroom learning, students are more attentive. More learning occurs as a result, with various outcomes. Students can unwind and concentrate when interruptions are removed. For students to get focused on the lesson 'aims and objectives, it is essential that the students be composed and calm. Well organized virtual classroom teaching improves job satisfaction, more potential for professional progression, reduce weariness and improve students' academic performance. As students interact with peers, experiences are gathered, this will assist

students in having a positive attitude to learning which makes them to be successful and functional in the nearest future.

Advancements in technology changed students learning habits, needs and circumstances, especially during the lockdown of 2020. The new generations are expected to have advanced level of digital competence; to accomplish this, teachers must carry out the teaching-learning process with students and encourage the acquisition of critical competencies. Digital competence is the set of knowledge, skills and attitude in the use of digital technology for the purpose of achieving goals connected to work, learning or pleasure. Thus, digital teacher's competence is a collection of skills and knowledge which teachers needs to manage the teaching and learning process, which entails computerization and information literacy, communication and collaboration, creation of digital content, and security in terms of personal protection and problem-solving. Researchers identified gender, educational background, motivation, attitude towards technology and students with particular education support needs as the challenges teachers encountered in using digital technology.¹⁸

The teacher is a key factor in the process of integrating technologies with learning in the teaching process, since the transformation process must always begin with the teacher in the first place. Digital teachers' competence is a collection of pedagogical, didactic knowledge, abilities and dispositions that the teacher must possess in order to effectively use digital technology in all of its dimension as well as the application of the ability to do so to the accomplishment of educational goals and objectives.

The indices for digital teachers' competence are commitment, communication and collaboration.

Commitment is loyalty displayed by teachers, and the emotional ties teachers have with students during learning. It compels continuous crave for something new which often drives towards excellence. Four qualities characterized committed teachers; their desire to improve as an educator, reliance on sources and factual information, acceptance of their values and commitment to fulfilling their professional obligations. Teachers' commitment is an internal force that motivates teachers to continue their involvement in the virtual classroom learning by devoting more time and efforts to it. The teacher's eagerness to support the students fosters an emotional connection between the teachers and the students, ultimately motivating teachers allows students to fulfil their goals, improves teaching and create a positive attitude to learning.

Communication is the process of transferring ideas, thoughts, knowledge and information in order to best achieve the intended aim. It involves the movement of information from one person to another or from one group to another. Teachers utilize communication as a technique to start and develop relationships with students' it entails speaking properly, maintaining good eye contact, paying attention while talking, asking the right questions, and matching one's voice to what the teacher is saying. In virtual classroom, teacher communicates with the students via Google meet, WhatsApp, telegram, audio and video services, video conferencing. Teacher takes responsibility to make sure students pay attention and talk only when necessary.

Collaboration centres on interaction and idea-sharing among teachers, they work together with the students in a virtual classroom learning, share knowledge, evaluates, encourage and provide feedback to students. Collaboration helps teachers to solve problems, brings teachers and students closer, learn from each other, opens up new channels of communication, boosts morale,

leads to high retention rates, and helps to divide up a heavy workload by creating solutions to tough problems¹⁴. However, some elements may be considered as obstacles to students learning processes when using virtual classroom platforms, such as lack of motivation, delayed feedback, accessibility to teachers who may not be available when students need their assistance, and isolation due to the absence of their classmate's physical presence. Nonetheless, these challenges can be solved with the help of teachers, who should adopt diverse teaching methodologies and understand how to use them. When teaching is entirely online, the difficulties may be magnified, this could be due to a lack of technological knowledge on the teacher's side or the short period of transitioning to virtual classroom teaching.

In a related development, the challenges faced by teachers during the COVID-19 pandemic era are numerous. Research was conducted to learn about the perspectives of teachers, administrators, and academics who had to continue distance education during the COVID-19 pandemic period as well as the obstacles they faced. A total of 65 teachers made up the pleasant study working groups. An open-ended written interview was used to acquire the data, content analysis was used to examine the information gathered, and according to the findings, teachers faced obstacles regarding access to internet, infrastructure, classroom management, and human resources. Another concern raised by the participants was that of the teacher and students' behaviour. It is reasonable to conclude that the participants were unprepared for distance education and that there was lack of application such as technical assistance, appropriate knowledge and expertise in this area¹⁹. The differences in the mastery of learning technologies between students and teachers were investigated when examining online learning from home at the junior, senior vocational, and university levels in Indonesia during the COVID-19 pandemic. A questionnaire

was distributed to students and educators via Google forms, Facebook, e-mail, and a WhatsApp group (WAG). The study's overall sample included 108 teachers and 386 students. Using the independent sample t-test, the following results were obtained. Students with significant differences had higher mastery of Microsoft (MS) office software and online learning technology than students without significant differences. There was no discernible difference in students and lecturers' perceptions of the importance of learning technologies in the classroom on the job. Students, teachers, learning resources, and the technology employed all had a role in the success of online learning. The study will also reveal some disadvantages of online learning, such as students' unruly behaviour, lack of student's access to internet, social content, which are typical challenges for educational institutions.

After lockdown, expensive schools adapted to social distancing, whereas students in public schools were grouped into (Morning and Afternoon session) to maintain social distancing. The implication was that many girls and boys were involved in petty business activities such as hawking, running errands to assist their parents, especially those laid off due to the lockdown. Many of the girls became victim of unwanted pregnancies, early marriage, house helps while boys were involved in cultism and negative use of platforms. Inequality in education became a reality for the government, parents, teachers, and students. There was a digital divide, inability to have access to internet facilities, poor connection, high cost of data lack of digital technologies and unpreparedness on the part of the teachers for the pandemic. Parents were able to realize the need to cooperate with the school management having discovered that education is a social experience; teachers too have a better understanding of the importance of digital technologies when some of them were laid off for the non-digital experience; the lockdown also made

stakeholders to realize that education does not only happen in school but also at home¹⁸. However, the lockdown exposed students to social vices which pave the way for immoral dealings, primarily when parents do not have time to guide their wards. It also increased the risk of poor nutrition, high rate of drop –out and exposes students to domestic violence; it should be noted that the quality of parent's resources and the home environment also created a gap between the advantaged and disadvantaged students⁹. Many unified examinations like SSCE conducted by National Examinations Council (NECO) WASSCE by West African Examination Council (WAEC) and National Business and Technical Examination Board (NABTEB) were postponed.

Considering the factors mentioned earlier, the researcher believes that the transition to an exclusive classroom will significantly impact the educational process and students' attitude towards using digital tools and virtual classroom platforms in the teaching and learning process, which forms the foundation of the study. In other words, the study will look at how digital teachers' competence, virtual classroom management factors will affect students' attitude towards learning in the COVID -19 Era, and how technology influenced their understanding and assimilation of information. Additionally, students will need to identify the challenges faced while using virtual classroom platforms.

Before COVID -19, the typical classroom situation used timetable to teach the students, and it was on one-on-one teaching, although it was a teacher-centred teaching process. The COVID-19 experience affected the economy and social life of developed countries; however, in Nigeria, it affected all spheres of life, especially education, where academically, the country is not adequately prepared. There was a delay in going digital. The use of digital in virtual classroom

management requires teachers to have a level of digital literacy and pedagogical knowledge to enable them to key into virtual classroom learning. Digital technology is an electronic tools, systems, and devices that generate, store and process data. It is the modern technology tools used by teachers in making the teaching-learning process more meaningful and effective¹⁵. These are instruments for conveying information via a discrete method, like letters or numbers. Digital technology has become the new normal as a result of COVID-19, for it to positively affect students' lives or impact their learning, teachers' competence in using digital technology is of great essence. The point to note is that such competency will not only impact students learning alone but will also improve their academic performance. Having the ability to use digital technology tools has become a necessity, most especially for the teaching-learning process. Initially, computer aids and digital gadgets were restricted to a specific field, but now it has become a norm. The use of digital technologies in teaching has brought challenges in everyday life, such as lack of knowledge in digital technology by the teachers, lack of accessibility and the belief in the chalk and board method of teaching²⁰

Competence is the ability to understand, create, and use digital technologies and systems. It entails knowledge and skills to make a teacher successful. Teachers must be vital in influencing information and enticing students 'use of technology in other to benefit from it. Competency can also foster a positive attitude and increase the acquisition of skills that can promote students learning and decrease the rate of dropouts. Digital teachers 'competence is a formalized system and applicability of the tools to assist students in achieving knowledge and understanding in various subject matter that is being taught, good interaction between teachers and students, ability to maintain orderliness, responding to student's questions without delay, communicating

and committed to his profession. It is also the ability to adapt creatively and confidently to the changing knowledge requirements of digital technology as well as the application of the ability to do so to the accomplishment of educational goals and objectives

Digital competence is defined as the use and engagement of digital technologies in a safe, critical and responsible manner for learning and for societal participation, which entails data and information, literacy communication and cooperation, as well as media literacy and digital content creation, are skills necessary to have which also includes programming and security, digital well-being and cyber-security, related issues, intellectual, property issues, problem-solving and critical issues. Thus, it can be described as the ability to use digital technology in a particular setting and possess the knowledge, skills and attitudes necessary to function in digital environment. Furthermore, it connects the educational components by encompassing the capacity to work in digital context.

Teachers' competence in digital technology is essential for attaining students' total development. For a teacher to develop digital competence in the teaching-learning process, there is a need to know how to access, evaluate, store information, interact with others, create and share information, safety, protection of devices, environment and health, and ability to store technical issues. Digital teachers' competence is the capacity to adapt creatively and confidently to the changing knowledge requirements of digital technology as well as the application of the aptness to do so to the accomplishment of educational goals and objectives. It deals with professional knowledge about technology that can be used to teach students through virtual classes. With the population increase of students in schools and the use of digital technologies, teachers could

promote further learning to improve the quality of education²⁰. Researchers have proven that teachers' access to digital technologies, technical support and quality training, communication, commitment and collaboration with students could determine their attitude towards learning.

Teachers communicate with students through receiving and delivering of information to inspire active involvement and develop a good rapport. In any educational system, the quality of teachers plays a major role in the ability to provide high quality instructions, listening entails a process of understanding and sharing information. The teacher assists in solving problems, evaluate self and the students to achieve the stated objectives. For effective communication, teachers should use clear and precise terms, listen carefully to students, be sensitive to their behaviour, encourage equity and utilize humour when appropriate.

Virtual classroom learning is an alternative teaching method dependent on a computer and the internet. It is an interaction that takes place in an in-person physical environment. Virtual classroom management is a new norm in the school system where the skills used to manage a classroom in person are translated to virtual instruction. It entails the preservation of relationships not only between human participants and androids, among other things. It can also be viewed as ensuring that lessons run smoothly, which entails planning, monitoring, financing, coordination, organizing and keeping students engaged. However, to have effective classroom management, teachers are to identify positive attitude standards, which are probably to be defined in the first lesson, maintain good rapport with the students, remain consistent and have clear guidelines and effort to have a better environment for the teaching-learning process. The teacher communicates with students in a language they will understand and uses related digital

tools available; this will encourage students' critical thinking and modifies their attitude toward learning²¹. The teacher coordinates a supportive learning environment through the parents to reduce disruption in the virtual classroom learning. By this, the teacher needs the cooperation of students in implementing virtual classroom rules. This study focuses on digital teacher's competence and virtual classroom management as determinants of secondary school students' attitude towards learning during COVID -19 Era has not been done in public and private secondary schools in Lagos State. The one done focused on perception of the pandemic on management, social media and COVID-19 pandemic and its effects on health care. However, researchers have reviewed series of studies on students' perception of learning during COVID -19 in Poland, India, and Indonesia²², among others, focusing on undergraduate students. The researcher endeavour to bridge the gap by investigating the digital teacher's competence, virtual classroom management and secondary school students' attitude towards learning in the COVID-19 Era, Lagos State

1.2 Statement of the Problem

The advent of the COVID-19 pandemic and the closure of schools have wrought significant disruptions upon the landscape of education in Nigeria. This impact has been particularly pronounced at the secondary level. The closure of physical classrooms gave rise to a pressing need to counteract the potentials educational stagnation among students. In response, the concept of virtual classroom management emerged as a pivotal strategy, taking shape and be implemented throughout a six-month lockdown period in 2020. During this phase, a noteworthy initiative was undertaken in collaboration with Lagos State government, involving expanded partnerships with radio and television stations. This collaboration aimed to develop and

broadcast educational content catering to the needs of the students. Notably, the pandemic induced educational adjustments and tool distinct forms across public and private secondary schools in Lagos State. Public schools predominantly embraced radio and television broadcasts, focusing on essential subjects. The content produced was pre-recorded, offering students easy access. Conversely private schools leveraged digital platforms such as Google Meet, WhatsApp groups, Telegram, and Zoom to facilitate remote learning experiences. This divergence can be attributed to various factors, including discrepancies in technological familiarity among administrators and educators, economic considerations among parents and students' relative unfamiliarity with virtual classroom dynamics, having been accustomed to traditional in-person learning methodologies. While several empirical inquiries have explored the perspectives of undergraduate students regarding the challenges of learning during the pandemic in developed countries, comprehensive investigations into the facets of digital teachers' competence and virtual classroom management remain conspicuously limited especially in a developing country like Nigeria^{23,23,25}. Similarly, existing research delved into aspects such as students and teachers' adaptability during the pandemic and teachers' perceptions of online instructional expectations^{26,27,28}. However, the crucial dimensions encompassing digital teachers competence and the nuanced orchestrations of virtual classroom environments seem to have not been subjected in-depth scrutiny. Therefore, this research endeavour aims to bridge this notable gap by conducting an exhaustive exploration of the interconnected realms of digital teachers' competence, virtual classroom management practices, and students' attitude towards learning during the COVID-19 Era. The focal point of this inquiry rests on the diverse contexts of public and private schools' secondary schools within Lagos State. By meticulously dissecting and analysing the intricate interplay of these variable insights that can contribute to the enhancement

of educational practices in the prevailing and potentially future scenarios shaped by unprecedented challenges like the ongoing pandemic.

1.3 Aim and Objectives of the Study

The aim of this study is to investigate digital teachers' competence, virtual classroom management and students' attitude towards learning in the COVID-19 Era in secondary schools in Lagos State.

The objectives are to:

- i identify the attitudinal level of the secondary school student's attitude towards learning in the COVID-19-Era in Lagos State (during and after lockdown)
- ii identify the level of digital teacher's competence in secondary schools in the COVID -19 Era in Lagos State (during lockdown and after lockdown)
- iii identify the most virtual classroom platforms used for teaching secondary school students in the COVID-19 Era in Lagos State (during lockdown and after lockdown)
- iv examine the most prominent challenge faced by students, in the use of virtual classroom platforms in the COVID-19 Era in Lagos State (during lockdown and after lockdown)
- v identify the most prominent challenge encountered by teachers in using virtual classroom platforms in the COVID -19 Era in Lagos State. (During lockdown and after lockdown)
- vi identify the level of teachers' compliance to the rules guiding virtual classroom teaching in the COVID-19 Era in Lagos state (during lockdown and after lockdown)

- vii identify the level of student's compliance to the rules guiding virtual classroom teaching in the COVID-19 Era in Lagos State (during lockdown and after lockdown)
- viii examine the combined influence of digital teachers' competence and virtual classroom teaching on secondary school students' attitude towards learning in the COVID-19 Era in Lagos State (during and after lockdown)
- ix ascertain the relative influence of digital teachers' competence and virtual classroom platforms in the COVID-19 Era in Lagos State (during and after lockdown)
- x examine the gender difference in digital teacher's competence and virtual classroom management on secondary schools' students' attitude towards learning in the COVID-19 Era in Lagos State (during and after lockdown)
- xi ascertain the school type difference in digital teachers' competence on secondary school students in the COVID-19 Era in Lagos (during and after lockdown) in Lagos State

1.4 Research Questions

1. What is the attitudinal level of the secondary school students towards learning in COVID-19 Era in Lagos State?
2. What is the identified level of digital teacher's competence in secondary schools in the COVID-19 Era in Lagos State?
3. What are the most frequently used virtual classroom platforms for teaching secondary school students in the COVID-19 Era in Lagos State?
4. What is the most prominent challenge faced by students, in the use of virtual classroom platforms in the COVID-19 Era in Lagos State?
5. What is the most prominent challenge encountered by teachers in the use of virtual classroom platforms in the COVID-19 Era in Lagos State?

6. What is the level of teacher's compliance to the rules guiding virtual platforms in the COVID-19 Era in Lagos State?
7. What is the level of students' compliance to the rules guiding virtual classroom platforms in the COVID -19 Era in Lagos State?

1.5 Hypotheses

- HO1: There will be no significant combined influence of digital teacher's competence, virtual classroom management and student's attitude towards learning in the COVID-19 Era in Lagos State
- HO2: There will be no significant relative influence of digital teachers' competence, virtual classroom management on students' attitudes towards learning in the COVID-19 Era in Lagos State.
- HO3: There will be no significant gender difference on school students' attitudes toward learning in the COVID-19 Era in Lagos State.
- HO4: There will be no significant school type difference in digital teacher's competence in secondary school students in the COVID-19 Era Lagos State

1.6 Significance of the Study

The thought of this study is that the result of findings will assist the government, administrators', curriculum developers, teachers, students, stakeholders and future researchers.

The government will see the need to eject more funds to education, particularly investing in digital technology, building computer laboratories, and making technological tools available to students in the rural and urban areas thus reducing the inequality gap between urban and rural school students. Schools in rural areas should be given priority in terms of resources like desktops, laptops, and learning materials. Government will also be able to have a rethink in providing solar-powered educational devices to students in disadvantaged and vulnerable communities. In addition, the government will need to introduce digitalization to all secondary schools, monitor the educational budget to ensure that funds are judiciously used for the purpose it is slated for, prepare the government for future occurrences of natural disaster and inculcating blended modes of teaching. The government will understand the need of providing teachers with ongoing training in digital technologies for use in teaching and learning activities so they can stay currents with events happening around the world. Students will have the chance to communicate with their teachers online, just like everyone else in the world does. Workshops, seminars, conferences, and internal training to stay current with innovative methods to improve students' academic performance

Additionally, it will help administrators in motivating teachers to generally adopt the culture of updating their digital abilities so that they will be relevant in promoting virtual classroom learning to catch up with the advanced countries more quickly than predicted. Also, it will assist them in figuring out how to entice teachers and students to use digital tools for virtual classroom learning while also fostering a good attitude in students towards learning. It is hoped that the study will be an eye-opener for teachers to the realities of using digital technology and encourage them to enrol in training programmes that will enable them to constantly affect secondary school students' attitudes towards learning.

More importantly, the result will be a wake-up call for policy makers to prepare adequately and strategize for future situation. Curriculum planners will be able to ensure that learning is to all children and that no child should be left behind.

Coupled with this, concerted efforts will be made by government from stakeholders to increase investment in the provision of modern infrastructures most especially in the rural areas. The consideration is that the result of this study would contribute further to the existing literature on digital teachers' competence, virtual classroom management and secondary school students' attitude toward learning among whom the study will be carried out, and even its likely implications on students' performance

1.7 Scope of the Study

The scope of the study is limited to senior secondary schools in Lagos state comprising of three divisions, Lagos central, Lagos East and Lagos West, divided into 20 Local government. Lagos central comprises of 5 Local Governments, Lagos Island, Lagos Mainland, Surulere, Apapa, and Eti-Osa. Lagos East consists of 6 Local Governments, Somolu, Kosofe, Epe, Ibeju-Lekki, and Ikorodu. Lagos West has 9 Local Governments, Agege, Ifako-Ijaye, Alimosho, Badagry, Ojo, Ajeromi –Ifelodun, Oshodi-Isolo, Ikeja and Mushin. The twenty (20) local governments are further divided into six educational districts Alimosho, Maryland, Falomo, Yaba, Agboju, and Oshodi- Isolo. Lagos State has 323 senior secondary schools, and 1,788 approved private secondary schools, Lagos State is located in the Southwestern part of Nigeria. It is bounded in the North and East by the Ogun State of Nigeria and in the West by the Republic of Benin. It stretches over 180 kilometres along the Guinea Coast of the Bight of Benin on the Atlantic Ocean, created on the 27th of May 1967 from the former Western region. The variables in this study are Digital Teachers Competence and Virtual Classroom Management as independent

variables and secondary students' attitudes towards learning in the COVID-19 Era as the dependent variable. The indices to measure Digital Teachers Competence are Communication, Collaboration and Commitment while the indices for Virtual Classroom Management are Planning, Organizing and Directing, the indicators for students' attitude to learning are Patience, Readiness and Self - discipline.

1.8 Limitation of the Study

The study's main limitation was the 2nd term holiday for schools in Lagos State which falls within the period of distributing copies of the questionnaire to respondents. This resulted in the delay of administering instruments to respondents

Other than this, not all private schools had enough hands-on ground, in terms of teaching staff., while some of those available cooperated with the researcher, by responding to the instrument, few did not return the questionnaires, however all these did not affect the validity and reliability of the study

1.9 Operational Definition of Terms

Attitude: A reaction towards an object or event which may be positive or negative.

The indices for students' attitude are:

Readiness: Student's availability with necessary technological tools and active involvement in the learning process

Patience: Students showing self-control and calmness during virtual classroom experience

Self-discipline: Abiding with the laid down rules of activities during the virtual classroom teaching

Learning: Students' ability to develop new skills through who the teacher is imparting.

Student's Attitude: Reacting positively or negatively on the subject matter taught

Virtual class: Is the online teaching in the absence of a physical location

Virtual Classroom Management: Involves the techniques used by teachers to control, discipline, plan, motivate and communicate with the students for effective teaching and learning to take place during online classes

The indices to be considered are:

Planning: Preparation needed by teachers for effective virtual classroom teaching

Organizing: Teacher's techniques of controlling the students

Directing: Techniques used by teachers to maintain discipline in virtual classroom teaching.

Competence: The ability a teacher has in using digital technology to impart knowledge on students.

Digital Teachers Competence: These are skills, knowledge and attitude teachers possess in using digital tools

The indices to be discussed for the digital teachers' competence are:

Communication: It is the way the teacher relates with students to make them get involved in the learning processes

Commitment: Teacher's dedication to teaching activities to have a positive impact on students' attitude toward learning.

Collaboration: Teachers working together with students to achieve stated objectives through active participation

COVID-19: Virus that ravaged the world which affected educational institutions including students' school activities during the period

COVID-19 Era: All activities regarding learning that happened during and after the pandemic.

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Chapter Two

Literature Review

This chapter shall be reviewed under the following sub-headings

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- 2.1.1 Secondary School
- 2.1.2 Secondary School Student
- 2.1.3 COVID-19 Era
- 2.1.4 Digital Teacher
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2.4 Conceptual Model

2.5 Summary of Literature Reviewed

2.1 Conceptual Review

2.1.1 Secondary School

Secondary school refers to the education students receive after elementary education, in which pupils take an entrance examination to Federal Unity Colleges or State public secondary schools. Secondary school education in Nigeria comprises of two-level levels; Junior Secondary School (JSS) and Senior Secondary School (SSS). The JSS level is a transitional period that represents the end of later childhood and the start of puberty. This era of life usually spans between the ages of 9 and 15 and is characterized by significant physical, cognitive, and social transformations in the child¹.

The goals of junior secondary schools are to develop young patriotic people who are capable of contributing to social development and performing civic responsibilities, instilling values and raising morally upright individuals capable of doing their own thing and appreciating the dignity of labour, inspiring national consciousness and peaceful co-existence despite differences in endowment, religion, ethnicity, and socio-economic background, and providing educational opportunities². In the Senior Secondary School, (SSS) their achievement in higher education is determined by the quality of instructions they receive at this level. Students write the state ministry of education examinations or the one supervised by the federal ministry of education through the National Examinations Council (NECO) at the end of the first three years of junior

secondary school. Students in the senior secondary school are streamlined with the certificate, counselled and distributed into one of the science, humanities, commercial, technical departments and One Trade/Entrepreneurial subject. Students must take a minimum of nine subjects, Students at this stage are in the throes of puberty, which comes with challenges, such as identity conflicts and self-awareness.

The broad aims and objectives of secondary school education in Nigeria:

- I. To prepare children for useful living within the society
- II. Preparing them for higher education. This stage builds the mind of the students to fit and compete with challenges in society.

To achieve these aims, in specific terms the secondary schools should;

- a) Provide a diverse curriculum to accommodate a range of abilities, possibilities, and future job
- b) Provide students with opportunities for quality education irrespective of sex, social, religious, and ethnic background
- c) Provide entrepreneurial, technical, and vocational occupations that require specific skills for self-sufficiency in agriculture, industry, commerce, and economic development
- d) Promote and develop Nigerian languages, arts, and culture in a setting that includes or involves cultural languages
- e) Raise a generation of people who can think for themselves, respect the views and feelings of others, their dignity of labour and appreciate those values specified under the broad national aims, and live as good citizens

- f) Encourage patriotism and national solidarity, focusing on common ties despite our differences, and raise morally upright children who respect the thoughts and feelings of others and value the dignity of labour¹.

If the aforementioned, secondary education objectives are well managed and implemented, secondary education will be a source of human resources supply and development of unique skilled production in higher education; nevertheless, if not properly managed, the future of our great nation would be jeopardized³. Secondary education is thus an important level of education that links primary and tertiary institutions which is the backbone of the country's workforce.

Secondary school is thus a basic level of education that serves as a bridge between primary and higher institutions of learning; the value on the social and economic development nations, Nigeria inclusive³. Parents, the federal government, and state government must support and invest extensively in secondary education at this level. Secondary school is critical for a student's social, emotional, and academic development. It will also equip the recipients with the knowledge, skills they need to succeed in the learning process and also provide beneficiaries with literacy and fundamental skills that they can utilize in the future in industries or government establishments while performing a job to support themselves¹.

.According to literature, secondary school is the midwife for future professional or otherwise half-baked intellectual. The cognitive, emotional, and psychomotor areas of learning have been highlighted. Secondary education is provided to students after they have completed primary school, and it is a type of schooling for students aged 11 to 17 years. It is designed to educate pupils for productive lives in society and prepare them for higher education for those interested and able to pursue it⁵. One of the levels of the National Policy on Education (NPE) is secondary

school. It is vital to transfer our cultural, social, and moral heritage. Secondary school students would gain knowledge, understanding, and abilities that they can apply in every situation¹.

However, homogeneity is not a frequent feature in a class, while some students are fast learners, others are slow learners, and some are very bright, it is the teacher's responsibility to guarantee that all students learn and they are catered for⁷. As a result, developing a good attitude towards studying and engaging meaningfully discussions in learning is pertinent for a student to comprehend the material thoroughly. The teacher's job is to ensure student participation in the teaching-learning process, assign students to read ahead of class through assignments, engage them as active learners during the lesson, evaluate, accommodate, praise them positively, and provide feedback on the completed assignments. Unless students' curiosity is gingered and their interest is aroused, they may feel less captivated, less interested, and less dedicated to the classes, causing their attention to wane and negatively affecting their academic performance

2.1.2 Secondary School Student

Secondary education is designed to educate students for successful living in the society, with higher education available to those interested and capable of pursuing it. It acts as a bridge between primary and secondary education. The secondary school is a launching pad for future careers and a foundation for choosing and categorizing specific fields of study¹. It is the final stage of primary education, and it aims to lay the groundwork for lifelong learning and human development by giving additional subject or skill oriented instruction

Nigeria's federal, state, and local governments share responsibilities on education, as stipulated in the 1999 constitution¹. The federal ministry of education (FME) is in charge of policy formation and quality control at the federal level and provides financial and infrastructural

resources for schools to run smoothly. At the state level, the state ministry of education is headed by a commissioner of education who oversees the state's educational operations. The primary school is overseen by the Local Government Education Authority (LGEA). The government's participation in education, on the other hand, has been overbearing and costly. Significant difficulties and hurdles to effective education are exacerbated by the diversity of organizational structures, bureaucratic constraints at various levels of government, and the customary red tape at the local school level. As a result, increasing private sector involvement in education is an excellent idea to reduce the government's monopoly of power. The federal government established 107 federal unity colleges in 36 states and the federal capital territory of Abuja to act as a vehicle for national unity and role models for states and private secondary schools in order to encourage patriotism and prevent ethnic rivalry. The FME is in charge of these schools, which are funded by the federal government and operated by the FME. State-owned institutions are controlled by the states on their modalities of admission to junior secondary schools, but the entrance to federal colleges is based on merit and quotas. The transition to junior secondary school is automatic and mandatory⁶.

Secondary schools are divided into junior secondary school (JSS) and senior secondary school (SSS). Junior secondary school (JSS) is a transitional period that represents the end of childhood and the start of adolescence. This stage of life, which generally spans between the ages of 9 and 14, is characterized by the child's fast physical, cognitive, and social transformations. 1. Junior secondary school 1 (JSS1), Junior secondary school 2 (JSS2), and Junior Secondary School 3 (JSS3) correspond to basics 7, 8, and 9, respectively.

The goals of junior secondary education are to:

- a) Provide the child with a comprehensive set of essential information and abilities that will enable him or her to pursue business and further education.
- b) Develop patriotic young people capable of contributing to social progress and civic responsibilities.
- c) Incorporate values and develop morally upright individuals capable of self-sufficiency and who value the dignity of labour.
- d) Inspire national consciousness and harmony, regardless of differences in endowment, religion, ethnicity, or socioeconomic background.

The Universal Basic Commission (UBEC) replaced the Universal Primary Education (UPE) to improve the success of the first nine years of schooling and add functional technological skills to the literacy skills offered to students⁹. Students who pass the Basic Education Certificate Examination in six disciplines, including English and mathematics, receive Basic Education Certificate at the end of JSS 3. The states administer the BECE examination in June, while the FME administer the examination through the National Examinations Council (NECO) during the first fifteen days of every year in May for all federal unity colleges, allied institutions, and private schools with a minimum of ten (10) subjects and a maximum of thirteen (13) subjects in the following.

- i. English language
- ii. Mathematics
- iii. Nigerian language (Hausa, Yoruba, or Igbo)

iv. Basic science and technology (BST)

- Basic science
- Basic technology
- Physical and Health Education
- Computer studies (IT)

v. Pre-vocational studies (PVS)

- Home Economics
- Agricultural Science

vi. National Value Education (NVE)

- Social studies
- Security Education
- Civic Education

vii. Cultural and Creative Arts (CCA)

- Arts and Crafts
- Music
- Dance and Drama

vii Business Studies

viii. French Language

- ix. Arabic Language
- x. Christian Religious Studies (CRS)
- xi. Islamic Studies (IS)
- xii. History⁸

Students at the senior secondary school (SSS) are in the throes of adolescence, which comes with its challenges, such as anxiety, mood disorders, social phobias, and panic disorders. It is also a time of sexual and relationship exploration and identity construction¹⁰. Senior secondary classes 1, 2, 3; otherwise referred to as SS1, SS2, and SS3, makes up the 10th, 11th, and 12th grades, respectively.

The following are the purposes of secondary education in Nigeria:

- i. Access to higher education regardless of gender, social status, religion, or ethnic background.
- ii. Provide a diverse curriculum to accommodate a range of abilities, possibilities, and future jobs.
- iii. Provide technical and vocational occupations with particular skills for self-sufficiency in agricultural, industrial, commercial, and economic development.
- iv. Promote and develop Nigerian languages, art, and culture in the framework of or through cultural languages.
- v. Inspire students to strive for excellence by encouraging them to develop themselves.

- vi. Encourage patriotism and national solidarity, focusing on the common good despite our difference, and develop morally upright and well-adjusted individuals who can think independently and nationally, respect others' ideas and feelings, and value the dignity of labor¹

After nearly two decades without a commission to monitor senior secondary schools (SSS), the federal government established the National Secondary Education Commission (NSEC) by resuscitating the law establishing it under act No.47 of May 26 1999, laws of the federation of Nigeria by establishing the National Secondary School Education Commission (NSSEC) in 2021 with the mandate to determine standards, educational needs, and global competencies, as well as manage the secondary education fund.

Students in senior secondary school (SS3) write the West African Examination Council (WAEC) and National Examinations Council (NECO) senior secondary certificate examination (SSCE) Students in SS3 are eligible to take the examination. A student must take a minimum of eight (8) and a maximum of nine (9) subjects to graduate.

Cross-cutting subjects are required.

- i. English Language
- ii. Science and Mathematics
- iii. Technology
- iv. Humanities
- v. Business Studies and
- vi. Trade/Entrepreneurship (one of the 34 subjects listed below)

1. Refrigerator and air conditioning
2. Animal Husbandry
3. Spray painting and auto body repair
4. Auto-Electrical Work
5. Auto-Mechanical Works
6. Auto Parts Merchandising
7. Block Lay, Brick Laying and Concrete Work,
8. Welding and Fabrication, Engineering Crafts practice.
9. Leather Goods, Manufacturing and Repairs
10. Carpentry and Joinery
11. Cosmetology
12. Bookkeeping
13. Dying and Bleaching
14. Furniture Making
15. GSM Maintaining
16. Marketing
17. Salesmanship
18. Stenography
19. Store Keeping
20. Textile Trade
21. Catering Craft Practice
22. Tourism
23. Fishery

24. Data Processing
25. Garment Making
26. Machines Woodworking
27. Mining
28. Painting and Drawing
29. Photography
30. Plumbing and pipe fitting
31. Upholstery
32. Radio-television and Electrical work
33. Printing craft and practice
34. Electrical Installation Maintenance Works

The following fields of speciality are collections of disciplines that will lead to future areas of study at the tertiary level. SS3 students must select only three (3) or four (4) subjects from each of the following groups:

Science and Mathematics

- i. Agriculture
- ii. Biology
- iii. Chemistry
- iv. Further Mathematics
- v. Health Education
- vi. Physical Education
- vii. Physics

Business Studies

- i. Accounting
- ii. Commerce
- iii. Insurance
- iv. Office Practice
- v. Store Management

Humanities

- i. Arabic
- ii. Christian Religious Studies
- iii. Economics
- iv. French
- v. Geography
- vi. Government
- vii. History
- viii. Islamic studies
- ix. Literature in English
- x. Music

Nigerian Language (Igbo, Edo, Efik, Hausa, Ibibio, Yoruba)

- i. Visual Art
- ii. Technology
- i. Auto – Mechanics
- ii. Basic Electricity
- iii. Building Construction

- iv. Clothing and Textiles
- v. Electronics
- vi. General Metalwork
- vii. Home Management
- viii. Technical Drawing
- ix. Wood Work⁹

Secondary school, according to studies, is the key to students' social, emotional, and intellectual success. It will also equip the recipients with the knowledge and skills they need to succeed in the learning process. According to a review of the researcher, secondary education provides beneficiaries with literacy and primary abilities that they can utilize in the future, whether in industry or a government setting, while completing work for a living. Secondary school students should acquire knowledge, skills, and understanding that they can apply wherever they go¹⁰.

Regularly participation in class discussions; the teacher should create an excellent example for students, make evaluation more precise, get students involved in-class activities and be interested in expanding their scope of knowledge. The teacher should assign students to read ahead of the class by giving assignments, analyzing, and giving positive feedback. Supposed students' curiosity or interest is not considered. In that case, they may become less interested and not dedicated to the subject taught, causing their attention to wane and their academic performance to suffer. Secondary schooling is a crucial time in a person's life, and it prepares students for professional development by enhancing their skills in basic subjects. The degree of teachers' involvement in the educational process will boost students' confidence and communication abilities, as well as the formation of a critical outlook on life¹¹.

2.1.3 COVID-19 Era

COVID-19 is a pandemic that began in China and spread worldwide, bringing the world to a halt and affecting all aspects of life, including education, social, economic, and health. Schools, markets, churches, mosques, and establishments, were forced to close. In December 2019, the first known infection from (SARS-COV-2) was detected in Wuhan, Hubei Province, China. The World Health Organization (WHO) labelled it a pandemic and contagious disease. Fever, cough, shortness of breath, vomiting, and loss of taste or smell are all symptoms of the infection. The world was confronted with incidents of the COVID-19 pandemic. As a result, many countries imposed travel restrictions and other measures such as frequent cleaning hands with alcohol-based sanitizer, soap and water, covering one's mouth when sneezing, using an elbow and tissue that must be discarded immediately after use, avoiding crowded places, maintaining at least one meter distance from one another, and wearing a face mask¹²

Individuals' lives have been affected due to the measures taken to curb the spread of the pandemic, which have a detrimental influence on the global economy and source of livelihood. Approximately 1.2 billion students were out of school, and school closures have impacted 73.8 per cent of the world's school population. As a result, the dropout rate has grown, and students have been exposed to social vices through the internet¹³. Nigeria's federal ministry of education (FME), like those in other countries worldwide, ordered all learning institutions to be closed on 11th of March, 2020. The sudden and unexpected closure of schools caused significant disruptions in Nigeria's educational system. Several disadvantaged students and their families were distressed due to interrupted learning, poor nutrition, unpreparedness for the transition from traditional method of teaching to digital learning, and the student's inability to communicate with

classmates. Positive cooperation and collaborations, resourcefulness, passion, and creativity from many teachers, families, and students, on the other hand, have been observed in the development of resistive learning experiences¹⁴

Before COVID-19, a typical teaching situation in school was characterized by students and teachers who covered their subjects in the content through formal instructions and depended on the school scheduled timetable. Apart from being enjoyable for students, school timetable aids in the development of social skills and awareness, students communicate, cooperate, and work in groups, making it easy for teachers to discover students' inadequacies. On the other hand, school closure is likely to psychologically impact students' lives while they are away from their regular school schedule. Studies have shown that 24.3 per cent of medical students in the United States of America suffered depression during COVID-19, slow thinking, difficulty in concentrating, and anxiety are all symptoms of depression in students, and they can have a significant impact on their academic performance¹⁵

COVID-19 Era had impact on people's lives all across the world. Students were depressed and anxious due to non-physical workouts and the fear of falling behind in their studies. Such psychological issues may make it difficult for students to adapt to online learning. More importantly, not all students have access to digital technologies; the shift from learning and teaching from traditional settings with physical interactions has had an impact on students living in poverty around the world who relied on the physical setting of their schools to provide educational materials, guidance, and occasionally a meal for the day¹⁶. Even though these inequalities existed previously, COVID-19 pandemic has brought this digital device to light.

Since more successful households were able to use libraries during the pandemic¹⁷. Several studies found that having access to libraries and other instruments for successful learning aided students' academic achievement, regardless of their family's financial situation

Uneven access to distant learning possibilities will lead to inequalities in educational result among students, with students from affluent families having an advantage over those from poorer families with less-educated parents. Despite the different forms of learning, most students in rural locations and those from low socio-economic background cannot access them¹⁸. In wealthy nations, the shift in educational paradigm from conventional face-to-face teaching techniques to digital learning happened immediately. This has a significant negative impact on students who live in less disadvantaged circumstances and those who cannot attend well-funded schools because they lack access to technology and internet resources. Education was brought to a total halt due to lockdown, and physical school was halted and grounded. Thus, education has always been a fundamental component of human existence, particularly in its informal form, in which parents have taught and trained their children about values, culture, ethics, and beliefs outside of the four walls of a classroom¹⁹

According to research findings, students at higher education institutions were also not spared. There was a need to experiment with and adopt new teaching methodologies, which led to the development of digital learning. Students could not have one-on-one contact with their teachers, and transitioning from traditional to digital learning was one of the hurdles they had to overcome. Many of these students spend more time on virtual platforms, exposing them to a wide range of offensive and violent content and an increased risk of cyber-bullying¹⁶. Scholars also discovered

that, due to the pandemic, smaller groups allowed for more active involvement and conversation and the achievement of specified learning objectives, which led to a better grasp of subjects. However, many clinical experiences cannot occur because hospitals ceased to admit patients, and recruitment of eligible applicants and a training system were also impossible²⁰.

According to research, learning inequalities has increased and decreased in Belgium, the Netherlands, Switzerland, and Ukraine. The losses are concentrated in students whose parents have a lower level of education, implying that students from more affluent homes received parental assistance from their families during the lockdown. Learning losses may translate into long-term issues connected with continuous assessment instruments, which may impair academic performance in the future, access to higher education, limited market involvement, and future learning. Distance learning encourages active engagement and a sense of belonging, which aids in the development of self-esteem and empathy by allowing students to interact with teachers and peers¹⁵.

Countries worldwide were proactive and imaginative in their approaches to influencing and assisting the delivery of knowledge to students. India (Gujarat) established state-of-the-art digital support centre for schools, allowing them to respond quickly with the distribution of digital materials and personalizing remote education to the students' learning levels. Similarly, Rwanda began broadcasting educational programs on television and radio and launching a YouTube channel. Zambian students had to rely on reading books, which was difficult without the help of teachers. Kenya sent parents revision papers via WhatsApp twice or once a month²¹.

Before COVID-19, ensuring students stayed in school and had access to education in Nigeria was a struggle. According to a United Nations Children's Fund (UNICEF) report, 10.5 million children aged 5 to 14 are not in school. Due to marginalization, states in the Northeast and Northwest did not enrol girls, depriving them of primary education. Students are not only missing out on education, which is a fundamental human right but are also at greater risk of educational setbacks, such as examination failure, cultism and depression. Schools have increased social skills and awareness, in addition to being entertaining for the young stars. Students endured economic, social, and psychological costs while away from their usual academic routine. As a result of school closure, many of these students took online classes and spent more time on virtual platforms, exposing them to online exploitation. Increased and unstructured online learning time has exposed potentially hazardous and violent information and the possibility of cyber-bullying. Most families rely on technology and digital solutions to engage their wards in learning²¹.

Internal evaluation is affected by the lockdown of schools, colleges, and public examinations such as the General Certificate of Secondary Education (GCSE) have been cancelled⁷. Due to the COVID-19 outbreak, various state board examinations, recruiting, university-level examinations, and admission have been postponed or rescheduled in India. Due to the pandemic in Nigeria, high-stakes tests were either postponed or rescheduled, affecting students' ability to maintain continuity in learning, it also affected examinations bodies such as the West African Examination Council (WAEC) and the National Examinations Council ((NECO).

However, moving beyond the current state of emergency and advocating for long-term reforms will be critical, despite this, many parents and communities criticized teachers' efforts, primarily

accountable for students' learning outcomes. Many parents balanced working or managing their household and actively providing for or overseeing their ward's home schooling. Students whose parent's socio-economic status cannot afford their wards to participate in remote learning may be forced to wait until school reopens before continuing their education. As a result, it is impossible to predict how many students will return to school once the pandemic is over²².

Although schools were shut, home-learning programs were established so that students could continue to learn; yet, students' in less fortunate circumstances and underfunded schools were the victims of government directives to close schools. This is because such students do not have the requisite gadget or internet access to participate in online classes, and the institutions do not have the resources to teach online. This is not the case of some states where schools and commercial companies distribute smartphones to students. Improved parental engagement, technology integration into education, and better disaster preparedness in schools are promising areas of improvement for future preparation against such catastrophes. This will open up possibilities for more personalized teaching and learning²³.

According to the literature, COVID-19 pandemic taught us that life is unpredictable and that we must be prepared to face challenges. All potentially critical and troublesome occurrences must be prioritized, and strategies must be made accordingly. To secure and offer the presence of these talents in their student's educational institutions; the pandemic revealed that students must acquire particular skills, solve problems, think critically, and adapt to the use of digital technology, learning tools, and digital learning resources like e-books and open online courses available. Countries must also improve their ability to provide mixed education options in the future. Students should be more prepared to switch back and forth between face-to-face and online learning as needed. This will protect students' education in the event of a future pandemic

and other shocks that could force the closure of schools, such as natural disasters or bad weather. It will also make more individualized teaching and learning approaches possible²³. In the light of this, a flexible curriculum that may be taught in person or online will be required in case of a school shuts down. Teachers must also be provided with up-to-date digital devices. The transition from traditional learning to digital learning is influenced by the resources and educational plans of Nigeria's several states. While states in the Southwest adopted radio, television, Edmodo, zoom, telegram, Google meet and WhatsApp, Bauchi state created e-learning systems for Koranic primary, and secondary school students²³.

COVID-19 Era experiences brought educators, parents, and teachers together to rethink the type of education required in the nearest future. Teachers gained a lot in the course of preparing, planning, and digital experience through remote learning. The pandemic spawned new rules and regulations, such as new words and phrases used in our daily lives, new platforms and solutions for future events, while government and individuals will be better prepared than they are now. In many developing nations, the pandemic caught the educational system off guard, and there are no guidelines for delivering online education in primary and secondary schools, especially in Nigeria. Online and blended learning were relatively new concepts in Nigeria before the pandemic. Few institutions fully embrace blended learning due to a lack of technological, inadequate human resources expertise, and motivation. However, for students to complete their education, COVID-19 forced educational institutions to adopt virtual classrooms as an alternative to face-to-face learning. It also contributed to a learning-friendly atmosphere by bringing stakeholders, including the government, parents, teachers, and students, to invest in the required technology tools to support online learning²⁴.

2.1.4 Digital Teacher

The transitional period, from the traditional teaching to digital education due to COVID-19, social practices changed due to the global health crises. The virus forced educational institutions to make drastic changes. In developed countries, digital technologies were used during social isolation and lockdown. Teachers have been educating students for centuries, employing textbooks, audio-visual aids, and the conventional method of chalk and board to make learning more engaging, motivating, and strengthening students' skills. In a traditional classroom, teachers offer information to students in person. It is the most frequent method of obtaining education, particularly in under-developed countries. It is a student-centre education in which students are encouraged to ask questions, participate actively in classroom activities, and take tests to assess their understanding²⁵. Before COVID -19, the typical teaching situation at school was characterized by students converging in a classroom-based on the class timetable taught by a teacher. Students pay attention to the teacher as a group and individually.

The competence and expertise a teacher have in using digital tools to impart learning to students through the teaching process is called digital teacher. A study, define a digital teacher as a teacher who has the skills, and knowledge to use electronic tools, systems, devices, and resources to process, store, communicate, and share screen creatively through social media, computers, desktops, and mobile phone²⁶ Some characteristics of a digital teacher have been identified, including, but not limited to:

- i. Professional commitment: Believing in discipline in terms of managing virtual classroom teaching from the curriculum to the use of different platforms and being

composed when having to take critical decisions and knowing when to draw the line when it comes to students- teachers' relation.

- ii. Digital resources: A teacher's ability to alter, produce, and share digital technology tools to meet stated objectives and teaching methods. He manages digital content and privacy carefully.
- iii. Designing: The teacher involves students in his teaching methodology, think quickly, and adjust lesson plans by designing, planning, and using technology at all stages of the teaching process.
- iv. Encourager: Teamwork is vital since it helps students to collaborate with others effectively. The purpose of the digital is to discover and support individual uniqueness, which will help students establish a favourable attitude toward them.
- v. Proactive feedback: improving on earlier evaluation to develop new and better evaluation methodologies and responding to questions from students.
- vi. Innovative: Using and trying new things by finding digital tools and explore them. This will aid in the proper retention of information²⁷.

The roles of a digital teacher in the use of digital technologies have been described as facilitators of learning, developing students' skills, effective communication and collaboration, developing new strategies, guiding and facilitating learning using a variety of methods and pedagogical approaches aided by technology. Furthermore, it provides teachers with a wealth of online resources applications and methods. This notion is supported by the fact that for a teacher to be digitally competent, he must be familiar with digital abilities, improve himself through professional training, be intentional and conscientious about his or her development²⁸. This will enrich students' learning and aid the teaching process.

Digital competence is the ability to confidently and critically employ the use of technology in all aspects of one's life. Computer applications, the internet, electronic communication, understanding the validity and reliability of available information, identification of ethical norms and principles to be considered when using digital technology, gathering, analyzing, and expanding electronic data, information, and concepts, access to and search of internet²⁹

2.1.5 Teacher Competency

Teachers' competency simply refers to the efficacy or efficiency with which a teacher performs the tasks in the learning process. It also refers to a teacher's behaviour in the classroom while interacting with students in the teaching and learning process³⁰. In its literal sense, teaching competency refers to best practices that can aid in identifying a teacher's skills, knowledge, and abilities for successful work performance. This demonstrates that teachers are nation's builders due to their substantial influence in developing and shaping the nation's human resources base. Nigeria's federal republic has varied demands and expectations for teachers' education capable of running a successful and thriving educational system¹.

Teachers' competency is a set of information, talents, and beliefs a teacher brings to the classroom learning process. This procedure establishes the appropriateness of work and the knowledge, skills, and abilities required to ensure that students are appropriately tutored. This gives the ability to exhibit expertise. As a result, teachers' abilities are divided into managerial and instructional activities. Instructional activities deal with what is anticipated from a teacher using instructional strategies, whereas management activities deal with rules and procedures in the teaching process, developing an acceptable behaviour that is good and helpful. This suggests

that teachers with a positive attitude toward teaching are better job performance, whereas those with a negative attitude are not. The inference is that teachers who are intrinsically motivated to educate will have a beneficial impact on their success rate and students' performance.³⁰

Teachers' competency is also defined as the degree to which their knowledge, abilities, and attitude are integrated. Competency is a set of abilities, knowledge, traits and behaviour that enable an individual to complete a task or activity within a given time frame. Teacher competence is valued as a verified ability in a specific subject area obtained via learning in a profession that may be assessed in terms of positive or negative value addition to a set of activities³¹. This suggests that (excellent) competent teachers can depend on their own experiences to bridge gaps between instructional theories, professional expertise, and practice. The ability to determine the efficacy of learning outcomes in the educational system is the essence of a teacher's competency³². Several other studies have suggested that teacher's competency requires a combination of knowledge of various teaching philosophies, their applications in various contexts, and recognition of their ethical significance³³

The four categories of competence have been identified: Technical or functional competencies are the required knowledge, attitude, and abilities to do a task. Managerial competence refers to knowledge, skills and experience. Human skills are required to acquire knowledge, ability to motivate, and promote human capital, as well as conceptual competence thinking which allows teachers to find solutions to different challenges through deliberate thought and abstract reasoning that may be used to plan the future⁴⁰. In other words, teacher competence is influenced by the teacher's experience, as experience helps the growth of the competency and abilities in using various teaching aids and learning environments. This means that teacher experiences may vary, as teaching experience might be difficult to fully comprehend³⁴.

The year 2020 will be remembered regarding teacher competency, particularly virtual classroom management because it was the year the entire globe underwent a global transformation due to the COVID-19 pandemic. The connection here is to the growing number of social difficulties that students and youth face, which has become a significant worry for educators and policymakers, leading to the choice to employ virtual means to promote teaching and learning through digital technology. The emphasis is that virtual classroom teaching has become the new regular and that teachers' competence in using digital technology tools is critical if it is to impact students' lives or their learning positively. Competence can also create good attitudes, boost the acquisition of abilities that help students study, and reduce the adverse problems that come with not getting an education³⁵

Teacher competency in the use and management of virtual classrooms refers to a formal system of using these platforms to reach out to students to achieve teaching and learning objectives, similar to the formal system of using the face-to-face method of teaching and learning to achieve knowledge and understanding³⁶. Knowledge gained through digital technology improves effective teaching and learning in schools, particularly in assisting teachers to improve their lesson presentation styles and contributing significantly to the educational development and social transformation of Nigerian society according to related literature. A teacher's ability to use platforms effectively can enhance their efficacy in the classroom. The inference is that a teacher's level of competency is proportional to their efficacy as a teacher because knowledge tends to make teaching more accessible, and students learn better and more effectively. This is to state that in this day and age, teacher competency in the classroom is not enough; what makes teachers more competent is their primary function of performance³⁷.

2.1.4 Digital Teachers' Competency

Digital technology has become the global language in all parts of life, and individuals across the globe, whether from a developed or undeveloped nation, are required to be versed in this digital world order. Everyone must acquire to compete effectively and efficiently on a global scale in all aspects of life. The importance of digital in a school system cannot be overstated, as it is at the heart of planning with a high rate of completing tasks effectively and efficiently in digital order. Teachers' capacity to mobilize and transfer their knowledge, strategies, abilities and attitudes about digital technology to real-world situations in their professional practice in order to facilitate students learning and acquisition of other digital competence, carry out processes for improving and innovating teaching following the needs of the digital era and contribute to their professional development is referred to as digital teachers' competence. Using digital platforms trafficked through the internet is one of the primary means of teaching and learning in the twenty-first century. This is why many transactions are processed more efficiently using this simple and quick method. Its application to internet transactions is crucial to any country's progress and development³⁸

To successfully face the difficulties of establishing a knowledge society and a global economy, eight fundamental skills for lifelong learning have been established. Among them are foreign language communication, mathematical competence, basic natural science and technology skills, learning capacity, social and civic competence, a sense of initiative and entrepreneurship, and cultural awareness and expression. In general, digital competencies are a set of knowledge, skills, attitudes, abilities, and strategies required for the quality use of technologies and digital media to

improve teaching and learning and other activities related to the teaching profession in an online and offline environment in a thoughtful, flexible, and safe manner. Digital competence can also be thought of as a set of communication skills and abilities which require the ability to comprehend and utilize the information offered in various ways on electronic devices, particularly computers, which can only be accomplished if specific digital skills are possessed. During the global COVID-19 pandemic, for example, the requirement to maintain social distance necessitated the performance of tasks such as teaching and learning via the internet. The sole constraint, particularly in teaching and learning, was that a teacher must demonstrate competency to be relevant in a digital context³⁹. The emphasis is that having a high level of digital competence makes teachers relevant in accessing the internet to source information or providing guidelines to their students, i.e., through various websites, social networks, and digital platforms that facilitate teaching and learning or personally interested in zeal align with twenty-first-century digitalization. The conclusion is that a teacher's capacity to demonstrate dexterity and skill in using digital platforms, which is now the new manner of processing and projecting professional activities, could stifle prospects for professional progress⁴⁰.

Although digital technology is not new in industrialized countries, the global pandemic that have pushed individuals to maintain social distance to avoid getting the fatal COVID-19 virus has prompted it to become the new normal. This resulted in a complete transition in the learning process from physical classrooms and laboratories to a virtual environment in the education sector. As a result, this shift is ready for those teachers, students, and institutions ready and willing to accept the new change by improving their digital skills. Although most Nigerian teachers were not initially prepared or aiming for the virtual learning environment, circumstances

finally forced the adoption of the virtual learning environment (VLE) to manage the teaching and learning process. This is where the particular teacher's ability to improve digital skills comes into play. Teachers can use a VLE to organize teaching and learning activities better, resulting in more productive results⁴¹.

Individual attributes are highlighted in the acquisition of digital competence, with demographic aspects, attitudes, personality traits, and technological proficiencies influencing how people engage with information system technology. The specifics to include in digital literacy (technology literacy) for teachers are knowledge deepening, didactic instruction (presentation skills), and professional abilities teachers require when using digital platforms⁴². Educational institutions are faced with the mammoth job of finding novel ways to conclude their educational activities, particularly in light of global societal changes. This is to keep up with new technological advancements and competencies, rendering many people incompetent due to their failure to keep up with the current trend. As a result, the development of digital skills is directly linked to personal achievement, employability, creativity, and wealth. The addition of technology from the society in which they function, which is currently digital is required for modern educational institutions⁴³.

Some variables are considered essential for good digital teacher competencies. Among them are the following:

1. Teacher training includes basic training and knowledge of digital technologies, which is the key to achieving competency.
2. Resources: It is critical to emphasize that digital devices and technologies' infrastructure quality and availability are critical. The more teachers incorporate digital technology into

their teaching and learning processes, the more effective their job performance becomes. This will positively impact students' attitudes toward learning.

3. Time commitment: Teachers' commitment to using digital technology in the virtual classroom is one of the strategies to improve their digital competency. Teachers' proficiency improves when they spend time preparing for a class using technology.
4. Attitude towards technology: Another essential issue is the teacher's attitude and opinions about using virtual classroom platforms for teaching. The teacher's mindset is reflected in how he or she uses digital technology, such as social media and other instructional tools⁴⁴.

It is just as vital to figure out how technology can be included in teaching as it is to identify teacher training needs so that their skills may be updated regularly.

Digital technologies have universalized verbal and audio-visual languages, created a new multimedia language based on user interaction that facilitates non-linear reading processes, and have multiple communication channels to make it permanent regardless of time and space. They have made it possible to become a universal communicator because of the shift in how people express themselves and access information. The educational system thus, must offer students a solid foundation in the new technology, using digital technologies in the virtual classroom, engages students in higher-order thinking, it improves communication, participates in problem-solving activities and debates, reflects on content and develops digital competency by incorporating the usage of many technological apps.

2.1.5 Virtual Classroom

The COVID-19 outbreak caught the globe off guard. Everything grounded globally, one of the most drastic method governments used worldwide to combat the virus's fear was a lockdown, in which people were forced to stay at home, businesses, schools, and leisure activities were shut down. Schools in Nigeria were closed down at all levels (primary, secondary, and tertiary), and students were forced to stay at home, putting learning on hold for some time. Education has always been an essential element of human life, particularly in the informal form, where parents have taught their children morals and ethics beyond the four walls of the school from time immemorial. It has now become unavoidable, either by necessity or otherwise.

A virtual classroom is a teaching and learning environment accessible via a computer-mediated communication system or through low-tech solutions (radio and television). Both teachers and students must be motivated; teachers, in their role as educators, have many pedagogical tools to choose to create lessons that fit the needs of all students. The efficiency of virtual classroom training is only limited by the technology available, everyone's ability to use it, and, most importantly, everyone's willingness to participate in the collaboration process⁴⁵. The two primary forms of virtual classrooms are synchronous and asynchronous. Students can choose between the two learning modalities in a virtual classroom. Synchronous happens in real-time, and it involves the use of audio, video, text chat and interactive whiteboard. If synchronous is selected, an online teaching session conducted by a teacher is organized, during which students can participate at the same time, receive answers to their questions at the same time, even if they are in different places. Synchronous activities facilitate students' interaction and build the teacher's experience. Learners can complete their education at their own pace and leisurely using asynchronous learning. It allows them to manage their time autonomously and choose the order of their activities. It is an

exciting field since students can get answers to their inquiries anytime and from any location. One of the essential functions of asynchronous learning is encouraging teacher-student collaboration⁴⁶.

The virtual classroom is a learning method that allows teachers and students to conduct instructions outside of the physical confines of the classroom by utilizing technological resources. Virtual classrooms are e-learning or web-based and can be used in various settings. There are currently several sites where technology is being used to provide a curriculum to students with positive results. As a result, virtual teaching is increasingly recognized as a fantastic way to use digital technology to reach out to students. A virtual classroom is an online learning system that provides the same opportunities for delivery beyond face-to-face teaching. It involves the use of the internet to facilitate meaningful and constructive learning environments, which include synchronous (communication in which the teacher and students interact in real-time) and asynchronous (communication via mail or online discussion)⁴⁷

Technical or computer abilities, affective or emotional abilities, and communication abilities are used to administer virtual classrooms to draw students' interest and capture their attention. The set of abilities will enable teachers; to master digital technology, comprehend students' affective and behavioural states, and use suitable communication strategies to help students develop a positive attitude. In virtual classroom education, several lessons are learned, including the need for adequate student orientation, allowing students to silence their microphone unless they want to speak to reduce interruption, and providing opportunities for students to speak⁴⁷

COVID-19 has become integral to our daily lives; nonetheless, the need for a virtual classroom cannot be eliminated. There are a lot of similar platforms used in Lagos State schools, for example, goggle meet, WhatsApp, zoom, telegram, radio and television etc.

2.1.8 Virtual Classroom Management

Many different platforms on the internet enable educational institutions to provide teaching and learning to students. It refers to the methods teachers use to ensure that lessons are practical and that students are encouraged to be self-sufficient. Teachers' face-to-face teaching skills can be transferred to virtual teaching, but a few new skills must be learned to succeed in a virtual classroom. This phenomenon, arise due to the COVID-19 crisis, which caused educational institutions, teachers, and students to switch from traditional presentations to virtual classrooms.

There are currently a variety of platforms via which technology is used to deliver content to students; participants have favourable views on the use of virtual classrooms for educational purposes⁴. As a result, virtual teaching is a fantastic way to reach out to students through digital tools. Virtual classroom management is a method of arranging learning, assisted by technology to fulfil stated educational objectives. Orienting students, determining how long each segment of the lesson will take, holding the teacher accountable for the time, beginning and ending of class routines, providing detailed instructions to students without causing confusion that could lead to misbehaviour, actively involving students' participation, and managing the learner's process that was initially planned to allow for modification and adaptation based on actual students' reactions are all examples of planning.⁴⁸

Virtual management classes are closely tied to subject teaching planning approaches, good time management, and the amount of time required by students. Despite the lack of a physical classroom for virtual teaching, the teacher uses the computer as a management tool for teaching and learning. In order to control students in a virtual classroom, the teacher must orient them by providing them with guidelines to follow. For example, he instructs students to keep their microphones on mute unless they want to speak to avoid interruptions, and he encourages and permits more engaging experiences⁴⁹. The teacher manages student communication and interaction, individually and collectively, as well as student behaviour, maintaining discipline, and ensuring that students pay attention to one another. Managing students' behaviour, maintaining discipline and control, and retaining students' attention during virtual classes is a new phenomenon for teachers. Thus, virtual classroom management can be referred to as a set of strategies, tools and techniques used to facilitate a smooth and productive learning experience in a virtual setting.

Strategies for Managing Virtual Classroom

There is no learning environment in which specific strategies do not guide the actions of teaching and learning. Managing a virtual classroom involves planning, organizing, coordinating and directing activities to achieve a digital classroom during teaching and learning effectively.

- i. **Planning:** Creating an engaging virtual classroom environment is crucial for keeping students actively involved in the learning process. Educators employ various techniques to promote students' engagement, such as interactive discussions, multimedia presentations, real-time feedback, and collaborative activities. These strategies aim to foster interaction among students and between students and teachers, thereby enhancing learning outcomes. The teacher plans an online class by mastering effective classroom

management and setting clear expectations from the students about the start of the class and the end time as the teacher delivers his lesson; the teacher should be time conscious, prepare lessons using available digital tools, develop and deliver class work that reflects sequencing and scaffolding of curriculum, and takes care of the timing of small group activities; and the teacher should be time conscious, prepare lesson based on available digital tools. Finally, do not switch off your camera if you want access to the students. If class activities are low, modify your teaching philosophy. If your teaching is successful, it will be based on how well you engage your students. In addition, when integrating a technological application into a virtual classroom teaching, it is critical to examine whether the technology features are appropriate for the topic to be taught. The technology should be developed to be simple for teachers and students and include all the elements required to facilitate students' learning.

- ii. Communication: Clearly communicating expectations and guidelines is essential in virtual classrooms to ensure that students understand their responsibilities, deadlines, and behavioural norms. Teachers should provide students with a comprehensive syllabus, detailed assignment and instructions, and a well-defined code of conduct. Good communication, helps to maintain discipline and create a structured learning environment.
- iii. Coordination: The learning environment is crucial to the success of virtual classroom management; any form of distraction should be discouraged to allow students to be focused and follow instructions. The conducive environment contributes to and strengthen students' cooperation for learning, thus, building a positive relationship and adopting a positive attitude. In order to create a supportive environment and ensure a positive learning experience, the teacher must clarify goals and remind students of

classroom expectations, coordinate and encourage active participation through discussion, questions, and answers, summarize discussion, and link it to course content. When students need help with their schoolwork, they approach their teachers.

- iv. Direction: Through good communication and collaboration, the teacher provides theoretical information, assists students in the teaching-learning process, directs and encourages them to participate in-class activities. He takes responsibility for the learning objectives, asks questions, and connects new and old concepts. Students will have better learning experiences due to teachers' confidence and ease with online teaching, which will lead to increased intellectual simulations. Students are urged to feel a sense of belonging as soon as they enter the virtual classroom and to be receptive to comments to feel more at ease while sharing their experiences, which will lead to a more positive attitude toward learning.

For improved understanding, teachers must implement strong virtual classroom management in a methodical and well-organized manner. This is accomplished through effective class management, which is critical to the teaching and learning process⁵⁰.

According to the findings, several tactics can aid in managing a virtual classroom. This includes assessing students' strength and weaknesses, following communication etiquette, setting expectations and consistency, and acknowledging positive reinforcement. This will result in increased engagement and, in turn, a good attitude toward learning⁵¹. Some teachers may have found this new way of communicating with students challenging because people often naturally resist change, particularly those whose idea of using technology in the classroom does not appeal to them, either because they lack competency in the area or because they are simply naive or unwilling to embrace change. Those who welcomed the change, on the other hand, simply

adapted. Some teachers went out of their way to ensure they were well-groomed for such situations. Despite enacting the 2020 lockdown, many students could stay informed thanks to the ability to skilfully control of the use of virtual platforms to broadcast or manage teaching and learning processes.

Positive classroom management does not bring immediate respite to the teacher but does tone down the students' behaviour. However, it guides students and peers on what to do, increases positive self-concept, promotes more involvement, reduces hostility, teaches students to detect positive attitudes, and improves student-teacher relationships. Teachers who organize and manage teaching and learning effectively will have a positive impact on students learning⁵².

2.1.6 Virtual Platforms Mostly Used in Lagos State

Virtual platforms are powerful tools for organizing and managing effective learning in a classroom. However, a teacher must exhibit certain abilities and competencies to be competent in using these platforms.

The Lagos State administration sought a solution to keep students occupied throughout the pandemic by launching the Eko digital school. It is an online platform created to ensure that all children in Lagos State continue to learn. "This initiative is the fulfilment of our education transformation focus areas, which are; to invest in technology as a learning aid, improve overall students' welfare and capacity development of school personnel, and establish and leverage impactful Public-Private Partnership, "⁵³. It was stated at the launching of the E-learning that Eko digital schools can serve ten million students. More importantly, the program was created to protect students from COVID-19 via an e-learning and teaching platform. It will help educators

develop 21st-century abilities and collaborate more effectively. They can access the platform, conduct live video sessions, and make such sessions available to students worldwide.

Eko Excel e-learning platform is another learning platform used in Lagos State. The Lagos state administration lent the Edo state government's e-learning platform to give quality education to the rich and the poor across the state and up-skill teachers using cutting-edge technology. The argument is that Eko Excel has significantly improved students' literacy and numeracy skills, with a considerable difference in performance between students in EKO EXCEL schools and their classmates in regular schools⁵⁴

Roducate, Nigeria's first indigenous e-learning platform for secondary school students was adopted by the Lagos State Government as the state's initiative to ensure that students learn outside the classroom. It provides the most comprehensive solutions for implementing e-learning on the vast scale required. Even the most severe issue that the majority of Nigerian students do not have access to internet-enabled devices is addressed by the platform. Roducate mass can be accessed offline to reduce bandwidth usage further. Only a government-approved curriculum is used by Lagos State, which has been approved by NERDC, NUC, JAMB, and the Lagos State Ministry of Education.

Roducate is a program that protects students' safety online. More so, countries employed e-learning as a strategy to avoid educational disruption during the COVID-19 pandemic. It also offers both West African and East African curricula, meaning that it is a solution that can be used across the African continent since the company has demonstrated its ability to play on the significant stage as the driving force behind it. The Lagos state government collaborated with an indigenous firm to provide free access to the digital platform, which contains personalized video

lectures, quizzes, and a games library on several subjects, to improve school learning outcomes. The internet portal aided approximately 10,000 students from several public schools.

There are a variety of learning platforms that were accessed via desktop computers, laptops, and mobile phone apps. WhatsApp, Telegram, Zoom, Radio, Television, and Google Meet among others. During the pandemic, these platforms were extensively used to teach students and are still being utilized in classrooms in various Nigerian states to boost teaching and learning. Lagos State is not left out. Television and radio: Mondays through Thursdays are class days Mathematics, English language, Economics, Chemistry, Physics, Biology, and Civic education are covered in the classes. However, no thought or provision was made for the inclusion and accessibility of children with disabilities (CWDS) classes presented via television, which do not use sign language. Interpreters are available for students with hearing disabilities, but the language of instruction does not always consider the needs of students with visual impairments. Graphics are not designed for students with intellectual disabilities, and radio classes are utterly out of reach for students with hearing impairments. The Lagos State administration received assistance from the Joint National Association of Persons with Disabilities (JONAPWD) in customizing the E-classes to meet the requirements of disabled students (CWDS). Equal involvement and inclusion of students and adolescents with disabilities in continuous E-learning to deliver high-quality education are the objectives⁵⁵.

Visual instructions are translated into sign language, making content easier to understand for students with intellectual and learning difficulties. During the COVID-19 Era, the Lagos State government supported various media houses to reach thousands of students with educational lectures. Television Continental (TVC) Radio stations, and Wazobia FM are among the media houses. The Lagos State government also partnered with Microsoft to train 18,000 teachers in

digital training, mentoring, observation, creating and presenting topic information, accessing interactive classrooms through mobile phones and devices, homework assignments, and feedback⁵⁴. The training resulted in an overall technological transformation of the educational system and improved teachers' performance in carrying out their responsibilities of influencing knowledge in the younger generation through technology. Private school owners established their procedures, which included frequent connection with teachers with good use of technology, resources that can enhance their teaching, and instructions on utilizing Google Classrooms, Zoom, telegram, WhatsApp and whiteboards, among other things.

2.1.7 Challenges of Virtual Classroom Management in the COVID-19 Era

Teachers and students encountered numerous hurdles in using the broad diversity of platforms and digital technology tools available during the COVID-19 Era. The following are some of the difficulties that have been identified and highlighted by numerous researchers. The need for additional assessment and evaluation of methods, the need to switch to formal assessment through harmonized and uncoordinated means, and the need to monitor and control examinations conducted online are all critical issues that have arisen as a result of the disruption of traditional education during the pandemic⁵⁶.

Other challenges include accessibility, affordability, flexibility, methodology, lifelong learning, and educational policy. In many nations, having a stable internet connection and access to digital devices are enormous obstacles. While many economically disadvantaged students in developing countries cannot afford internet access, online learning exposes students to the perils of excessive screen time. Another issue is the lack of parental guidance, which is especially problematic for younger students when both parents are at work. Naturally, learning is often affected because

they require less monitoring and coaching. Students who are deficient in learning encountered challenges, and impoverished student cannot access and finance online⁵⁷.

Another issue noted, is a lack of preparation and pre-requisites regarding time, digital tools and support from students on topic teams from switching to virtual classroom learning. Teachers' lack of technical know-how, professional involvement in digital resource, selection, management, and sharing of digital tools, are other challenges teachers experienced with virtual classroom management were considered insufficient⁵⁸. Lack of enthusiasm from teachers, failure to adapt to changes in technology, belief in the chalk and board teaching, time consumption, language difficulties, inability to motivate students and lessons that are not student-cantered are some of the challenges of virtual classroom management. Poor internet connections, inability to purchase data owing to family background, poor electricity, missing spontaneous encounters between teachers and students, and distractions from their environs were all issues that students faced, albeit their experiences varied from country to country⁵⁷.

2.1.8 Student's Attitude Towards' Learning

The preference for resistance to a given thing, object, location, person, or event can be defined as an individual's attitude, since it affects a person's behaviour. It plays an integral part in learning. Feelings, thoughts, and attitudes are all part of this and their mindset determines an individual's success. Attitude influences what one enjoys or says in a given scenario, what he enjoys or dislikes, how he interacts with others, and how he reacts to events in his life and the world around him. Attitudes are formed via experience; their shape is determined by the environment in which the child grows up and the treatment he receives⁵⁸.

Attitude is viewed as everything that impacts or determines a person's behaviour, and it plays an integral part in learning. A person's attitude determines how effective he or she is in accomplishing his or her objectives. Good or terrible, positive or negative, attitude falls into one of two groups. This indicates that a student's attitude toward learning will significantly impact his or her grades. A positive attitude is one of the most effective ways to make a significant difference in one's life. This explains why many people believe that having a cheerful and energetic mindset is the most incredible attitude for everyone⁵⁹.

The four fundamental kinds of attitudes identified by psychologist are Positive, negative, neutral, and apathetic.

Positive: Positive attitude offers a variety of advantages that influence others' behaviours, focusing and absorbing information, making better decisions, taking risk and trying new things.

Negative attitude: People who have negative attitude neglect the positive aspects of life and are solely concerned with whether or not they will succeed, lack confidence, pessimistic, underachievers, energy suckers and they complain about everything. Running away from problematic situations is a common technique to get out of them. They judge others and look for flaws in them.

A neutral attitude is a state of mind in which people overlook life's issues. They sit about waiting for someone else to solve their problems. They live a sedentary existence and are frequently emotionless. Anything is as though they have not given much thought and do not give a damn about it. They never feel compelled to change since they can live comfortably in their current state⁶⁰. A person with a perspective and positive attitude will look for the good in others, regardless of how horrible they act or how negative their attitude is. The former is referred to as a person with a positive mindset since he considers the larger good. These individuals are

unconcerned about life's difficulties; believe in a better tomorrow, work on honing their talents regularly and are capable of overcoming practically any obstacle. The following are some of the ways to maintain a happy attitude:

Confidence: It is vital to embrace life with intense and passionate feelings. Looking at things confidently and declaring "I am up for this" is sufficient to represent one's attitude toward life in general and attitude in particular. Confidence, aids individual in being prepared for the future and life experiences, doing new things and reaching out to others.

Happiness: A joyful mind is a haven for all of one's positive qualities. Confident people are content since they are unconcerned with the outcome; conversing with others and expressing one's feelings allows one to understand one's strengths and limitations. Sincerity refers to a positive attitude that may be the only route out of a difficult situation, and expressing gratitude to others, whether for a job well done or for a kind word, can make others smile, resulting in an exemplary sequence of events. Communication abilities alter one's thinking and behaviour, and they can help you transform your attitude to one of optimism.

Sikken attitude: capable of destroying any image associated with a favourable picture. This more negative mindset is highly damaging and frequently reflects the negative thoughts that run through the mind. For the sake of your well-being and the well-being of others around you, you must let rid of this mindset, since attitude is deeply ingrained in one's psyche, they are generally difficult to change.

Attitude is determined by the significance of the object it relates to. A student's attitude toward themselves is critical to their growth, success, and self-love or self-hate in excess is not conducive to academic success. Students must be able to see and accept themselves in their

current state and their relationships with others. Furthermore, students must learn to have a favourable attitude toward school authorities, not to be arrogant or domineering, but to respect themselves and other students with whom they interact. A person's taught inclination to react positively or adversely to an object, circumstance, concept, or another person is called attitude⁶¹.

Some opined that internet use by students has a negative effect because it seems it exposes students to social vice such as addiction, harm to cognitive development, and information overload. In contrast, others see it as a healthy development because it aids students in academics, communication, connectivity to learning. Attitude refers to how one feels about something, whether good or bad. A mental set or position toward a subject is a starter definition of attitude. As a result, beliefs and emotions should be addressed when determining one's attitude toward learning. Attitude and behaviour are interwoven to the point where individuals determine how they react to objects, events, and others. In a dynamic and learning process, our conduct is informed and impacted by our attitude, which in turn is informed and impacted by our feeling⁶².

According to the researchers, attitude is multifaceted, encompassing three aspects: affection, behaviour, and cognition. Affection is one's initial reaction to something, which could be favourable or harmful. Memories or experiences form our feelings about things. Affection comprises the subject's feelings, thoughts, and vision. Emotions are pleasure or satisfaction in studying a subject and boredom, difficulty, or dullness in learning the subject. Students' beliefs about their capacity to learn the material are linked to their confidence. Students' perceptions of learning a new skill are represented by vision, while students' drive to learn is reflected in their behaviours, commitment and performance in class are represented by behaviour. Cognitive is based on an object's original individual, based on information and facts about the object being assessed⁶³.

It is essential to realise that learning changes people for the rest of their lives, and distinguishing between lost and gone items can be challenging. Educational psychologists have defined learning in various ways, with various meanings. It is a series of events in which a person's knowledge, abilities, and behaviour evolve. Learning is a long-term change in behaviour or the ability to behave in a certain way due to practice or other types of experience. It entails acquiring and changing knowledge, skills, strategies, beliefs, attitudes, and behaviours, among other things⁶⁴.

Different kinds of learning recognised by psychologists:

Motor learning: The majority of our daily activities include movement. Walking, running, skating, driving, climbing, and other actions that a human is required to do in order to live an everyday life must be learned. All of these movements necessitate muscle coordination.

Verbal learning: Concerns the words we use and the communication technologies we utilise. Signs, drawings, symbols, words, and figures are among the tools used in these activities. The use of words to communicate is every day.

Concept learning is a sort of learning that requires higher mental abilities such as thinking and intelligence. We have learned various concepts from birth; abstraction and generalisation are two processes involved in concept learning. This information is beneficial when it comes to recognising and identifying objects.

Discrimination learning is the ability to recognise stimuli and respond correctly to them.

Learning of Principles: To efficiently manage their work, people study certain principles in science, mathematics, language, and other areas. These principles consistently demonstrate the link between two or more conceptions; formulae, laws, correlations, and relationships are all examples of relationships.

Problem-solving: this is the type of higher-order learning. Thinking, reasoning, observation, imagination, generalisation and other cognitive qualities are required for this type of learning. This is beneficial in assisting people to overcome challenges and issues.

Attitude learning: From childhood, we develop varied views toward people, objects, and everything we are familiar with. Teachers' perceptions about their profession, students and parents are instances of people who can respond positively or negatively based on their opinions⁶⁵.

2.2 Theoretical Framework

2.2.1 Connectivism Theory

People now live in the digital age, relying on technology to get answers and information. Years back, students looked up for answers in dictionaries and encyclopaedias, but now, using digital technologies during virtual classroom teaching has exposed them to new learning. Instead of learning from the teacher and textbook through face-to-face teaching, students now use smart phones, desktops, iPad, and laptops as sources of information. A digital tool is an educational technology that has altered the learning landscape of students. This has created a void in traditional teaching approaches, and the demand for new teaching has resurfaced to keep students engaged in their studies. Connectivism is a modern-day theory accepts technology as a major important factor in our learning process, thus promoting the idea that learn can happen through digital channels such as social media, videos. It adds to the arsenal of tactics for creating a learning environment that prepares students for academic achievement.

George Siemens and Stephen Downe created connectivism to describe how technology has changed how we live, communicate and learn while George Siemens felt that learning begins with connections, Stephen Downe, believed that learning is increased by socialisation, technology, diversity, the strength of relationships, and the context of occurrence. They both discuss how technology plays a vital role in the learning process and how the digital age has increased the speed with which students can obtain knowledge. Students are considered the link between learning and technology, when technology form connection, learning occurs. Siemen identified eight connectivism principles:

- Learning is a process of linking.
- Learning and knowledge can be found in non-human appliances (Video, YouTube, Radio, Television, Computers)
- Learning and knowledge are perceived from several perspectives; different teachers taught students during the COVID-19 Era.
- Connections are formed and maintained in order to continue learning.
- Learning is viewed as learning between fields, ideas, and concepts.
- Learning necessitates current knowledge, and learning is more important than knowledge.
- Learning is a process of making decisions⁶⁶.

Connectivism Learning Theory

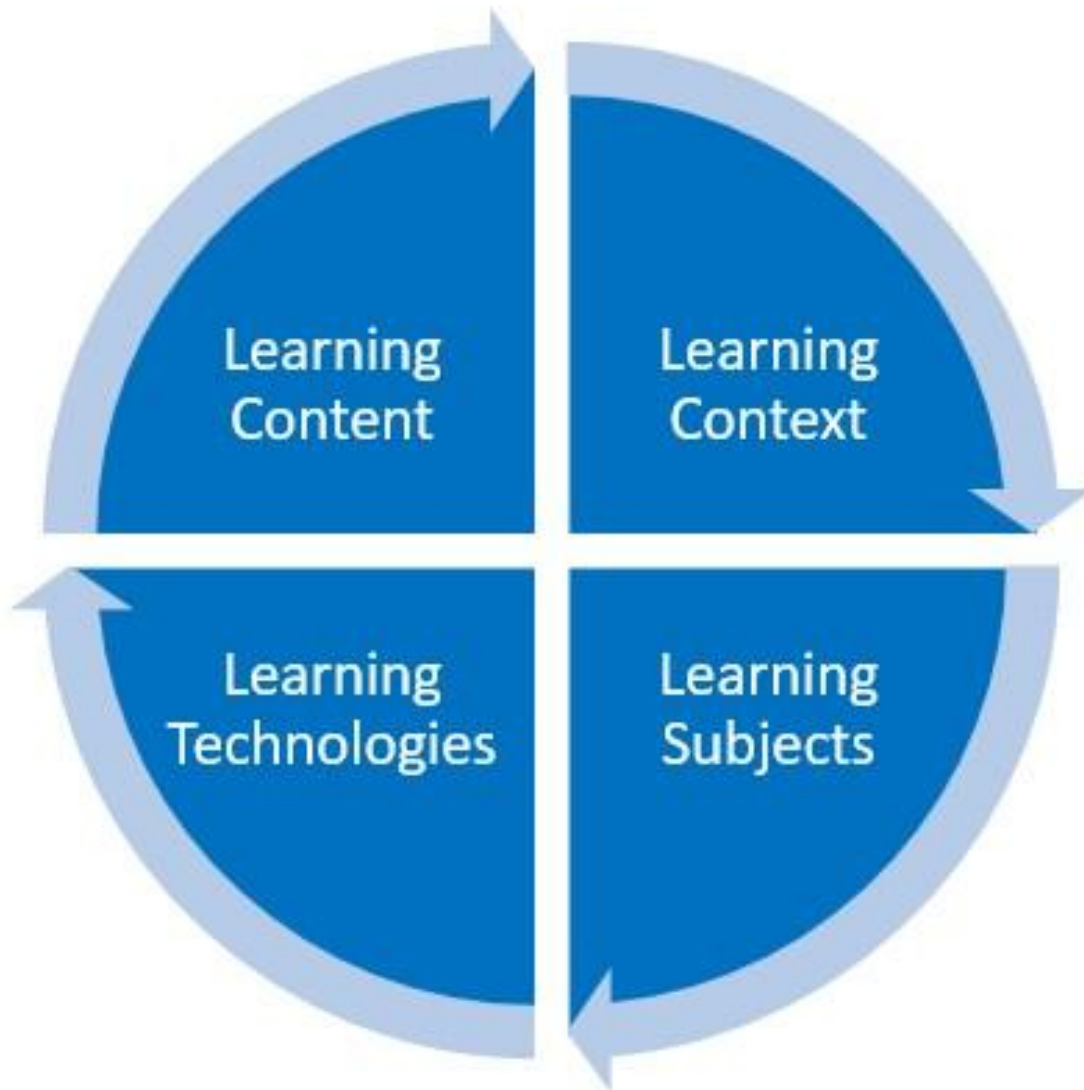


Figure 2.1 Connectivism Learning Theory⁶⁷

The new learning responsibilities are transferred from the teacher to the learners under connectivism, with the teacher serving as a guide for students' effective learning and personal growth development. Connectivism promotes students' participation and conversation, allows for individual viewpoints during decision-making, and promotes learning outside the classroom⁶⁷.

Connectivism emphasizes that information is available and that learners' responsibility are to be able to discover and apply knowledge when and where it is needed rather than to memorise or understand all that is taught. Through collaborative projects, peer-to-peer learning, and problem-solving, students are involved, this fosters a strong sense of ownership, teamwork, and improved learning because of its use of language. It has been suggested that Connectivism have not contributed to a theory or learning reform. Its mis-representation often prove alternative learning theories such as constructivism, behaviourism, and cognitivism, as well as its inability to explain how learning occurs, does not contributing to a general world outlook⁶⁸.

Connectivism have been attacked as a social institution that has surrendered its sovereignty to technology, rejecting traditional cultural beliefs. At the same time, a culture that believes in human growth and technical innovation. The theory is also thought to ensure that individual information, and knowledge are not autonomous but linked to others through web context, culture, and pre-connection. Connectivism has the potential to fill up the gaps that other theories have left in current education. Adaptability to distinct features, filtering of a large amount of information available, and the building of learning networks, particularly those unrelated to the conventional education system

On the other hand, connectivism is an attractive idea for professionals that operate is with digital media on a budget; it is also about making connections with ideas, facts, people, and communities, which connectivism aids learners in realising. Connectivism is a learning theory for the digital era that allows students to work together through communication and collaboration using digital tools, students are viewed as the "connection" who facilitates the communication and collaboration processes, the usage of digital technologies and virtual classroom learning may foster a positive attitude toward secondary school students.

Connectivism should employ constructivism, behaviourism, and cognitive to identify the applications of network learning, according to the literature, more research is required to fully, comprehend the impact of connectedness and how technology in a connective framework is rewriting our brains.

Relevance of the Theory to the Study

Connectivism is a good fit for this study because it entails active participation and guidance from teachers to students in a collaborative effort to successfully use digital technology in the teaching-learning process for learners in a richly mediated environment. It allows students to advance to the next level of achievement by allowing them to move beyond a mere understanding of what is going on in a situation and take an active role in achieving success. A new set of abilities and information is acquired that they can utilise in their daily lives, thus students learn about themselves with the help of their teachers⁶⁹

Connectivism is also relevant to this study in that it sheds light on the abilities and tasks that learners will need to succeed in the digital age and also encourages group collaboration and discussions by allowing students to express their views and perspectives, which can be considered in problem-solving, decision making and information interpretation. It is also linking previous knowledge to current information to create new meaning and understanding and guides students to look beyond their own understanding to connect information.

2.2.2 Technological Pedagogical Content Knowledge Theory (TPACK)

Technology is essential for students to be ready for job growth in the 21st century thus, teachers must use technology for the teaching and learning process. The rise of digital technology has changed how teachers and students interact and learn in a technological advanced environment, making technology an indispensable part of their lives.

Lee Shulman proposed Pedagogical, Content and Knowledge (PCK) PCK is mixing of content and pedagogy to improve comprehension and how certain topics, problems or situations are organised, portrayed and tailored to learners' unique interest and range of skills

Content knowledge refers to what the teacher intends teaching which include; subject matter, concept, curriculum, principle to teach students

Pedagogical: It the vehicle that develops the skills in students to show case mastery of the content or the art of teaching through instructional approach, inquiry-based learning, game-based.

Scholars criticized PCK on the grounds that: it represents a class of knowledge that is central to teachers work and that technology cannot be separated in a situational nature of the classroom for instance, instructional videos cannot be adjusted to meet the specific needs of a group of students since it emphasizes" what" and not" how" is a teaching learning activity.

Punya Mishra and Matthew Koehler, however, amended PCK and added technology (which was initially treated as a separate entity) resulting to TPCK which later renamed TPACK (Technological, Pedagogical and Content Knowledge). The framework outlines how a teacher combines their understanding of topic, pedagogy and technology for effective teaching making it ideal for teachers who want to incorporate technology into the classroom. which emphasizes connections, interaction between pedagogy and content knowledge thus having TPACK (Technological, Pedagogical, and Content Knowledge) TPACK focuses on how technology is integrated into teaching by giving teachers a comprehensive understanding of the knowledge base they needed to employ technology in education successfully. The specific technological tools include hardware, software applications associated with information literacy practices are used to guide students towards a better, more robust understanding of the subject matter, the three types of knowledge include:

Knowledge of the subject matter (CK

Pedagogical expertise (PK)

Technological expertise (TK)⁷⁰

TPACK represents a comprehensive understanding of how to use technology to improve student's learning experiences while addressing the dynamic, diversified, and situational nature of teacher knowledge. Technology, Pedagogical Content knowledge (TPACK) aims to determine the type of knowledge that teachers require to have to integrate technology into their classrooms.⁷¹

Pedagogical Knowledge; (PK) includes teaching methods and processes, classroom management knowledge, lesson plan, assessment and classroom management.

Technological Knowledge (TK): laptops, desktop computers, internet connections, projectors, interactive whiteboards, and television.

Content Knowledge (CK): relates to the understanding of the subject matter to be taught and acquired.

Pedagogical Content Knowledge (PCK): is concerned with the teaching process. It combines content, pedagogy and knowledge to help teachers create better teaching materials.

Technological Pedagogical Knowledge (TPK): deals with the understanding of how teaching is applied in the classroom by using various technologies to teach.

Technology Content Knowledge (TCK) explains how technology can help students build a new way of representing content, enhancing, transforming for future use

Technological Pedagogical Content Knowledge (TPCK) Integrating technology into teaching, thus preparing teachers and students in collaborative learning and to develop instructional methods, student attitudes, and desired outcomes that will promote positive learning⁷² It thus make sense to comprehend the intricate interactions between the three fundamental knowledge components (PK, CK, and TK) in connection to impart subject matter information while utilizing the appropriate pedagogical techniques and technological advancement.

7 Components of TPACK

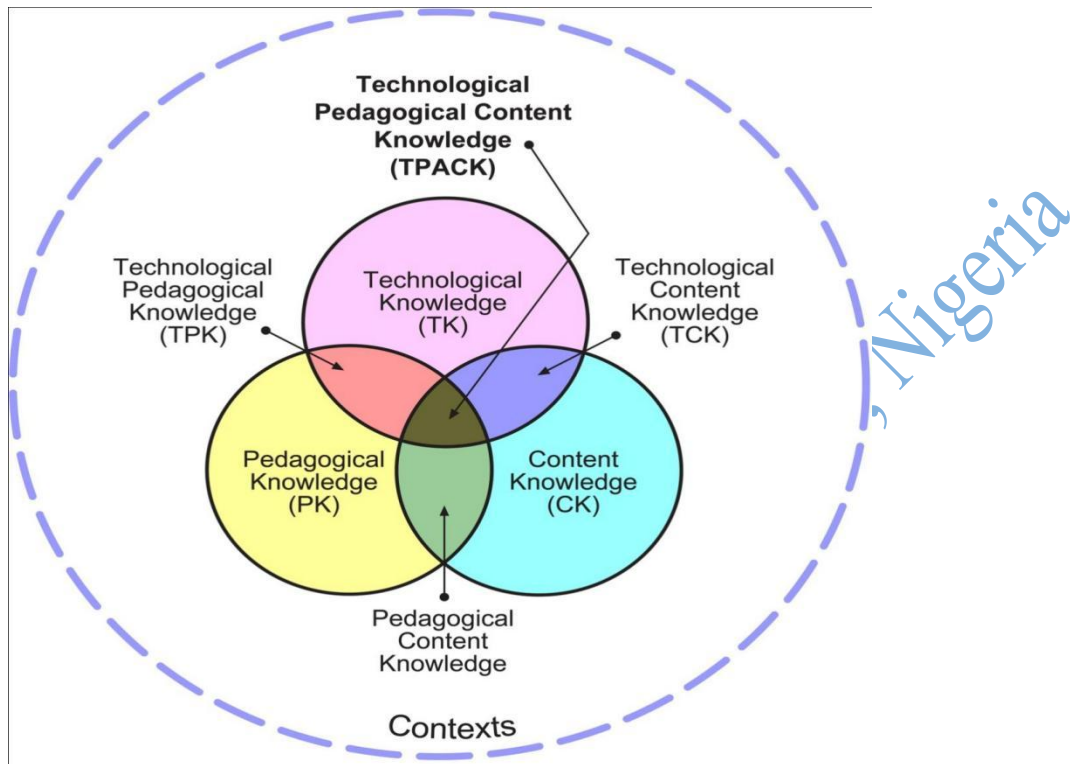


Figure 2.2 TPACK Framework⁷³.

Most administrators and teachers recognise the critical role of technology in the teaching and learning process and the importance of preparing students for a technologically driven future to make teaching and learning easier. cost, digital gap, time-intensive, lack of infrastructure, disturbance from environment and poor network, traditional mindset, and lack of confidence were mentioned as potential impediments to technological deployment for teachers in the critique against TPACK. Another expert claimed that technological knowledge could not be regarded as context-free and that good teaching requires an understanding of how technology interacts with pedagogy and content⁷⁴

However, TPACK is viewed as providing a guiding template for technology interaction, allowing teachers to revisit existing teaching strategies and consider new ways to deepen understanding through media that requires students' participation, as well as measurable objectives and evaluation. TPACK allows teachers to connect technology, context, and pedagogy in the classroom. Teachers can transfer knowledge and skills to pupils through this relationship, resulting in a positive attitude toward learning. The research issue is connected to TPACK since it may be used to assess teachers' knowledge, which impacts training and professional growth. Changes in teaching tactics result in a more positive attitude among students and changes in their learning. Technology integration encourages the effective and efficient use of technology while also improving the efficacy and quality of the teaching-learning process. Teachers do not need to know everything about TPACK; they need to know that content-driven, pedagogically sound instructional approaches are the most effective in the classroom.

Relevance of the Theory to the Study

TPACK offers a more comprehensive and quick response to students' needs and expectations, as well as cooperation and communication opportunities. It makes lessons more interactive and focuses on the students. Tpack is a parameter for professional teachers in the 21st century in assisting teachers to provide a map for understanding and how to integrate it into classroom teaching to enhance students' growth and develop positive attitudes toward learning. Guides curriculum developer and teacher education to choose learning outcomes, the process of learning, content, and choosing technology that will aid students learning.

2.3 Review of Empirical Studies

2.3.1 Digital Teachers' Competence in Student's Attitudes to Learning

Several empirical studies were reviewed on online teaching during the COVID-19 pandemic. A study investigated how well students and teachers could cope with the drastic changes brought on by the COVID-19 outbreak, as viewed through the eyes of both students and teachers. The concept (volatility, uncertainty, complexity, and ambiguity) VUGA was applied. It was utilised in conjunction with a qualitative study to see if teachers' preparation of the curriculum provides students with emotional skills. The teacher education curriculum should enable and develop students' social-emotional competencies using various methods such as stress management techniques, teamwork, and digital supports platform, according to 54 student-teachers and 24 teachers who responded to an open-ended questionnaire and 16 semi-structured interviews from the research. Teachers' educators are crucial in teacher education because they help potential teachers scaffold their skills, attitudes, and knowledge so that they are more prepared for future scenarios they may face in their careers⁷⁵.

Another study on online teaching during the COVID-19 pandemic highlighted the drawbacks and opportunities of virtual teaching. The results indicate that some of the challenges include a lack of direct interaction with learners and a sudden change of setting, had the most significant impact on the participants' learning process; however, students and teachers suggested that the experience gained would help them in their future career to some extent. All teachers kept in touch with their students and parents, according to the findings. Challenges that necessitated the integration of digital technology, such as online teaching and evaluation, were measured to an extent. Teachers' self-efficacy was essential for task differentiation and student feedback. The importance of teacher competency in achieving appropriate educational goals is demonstrated by these studies⁷⁶.

In addition, another study aimed to analyse teachers' perceptions of online teaching expectations before remote teaching and experiences after a month of online teaching during the COVID-19 pandemic in the Netherlands. 200 Dutch Teachers took part in two surveys. The findings revealed a dramatic shift in teachers' perceptions of their resolutions to incorporate technology into their lessons in the post COVID-19 Era. Teachers' gender and past digital technology experience appear to play a minor influence. It did, however, have ramifications for teachers regarding their capacity to use digital technology and demonstrate the positive and negative aspects of online teaching⁷⁷.

Furthermore, during the COVID-19 Era, a study carried out on teachers' perceptions of virtual platforms in Mexican higher education. Teachers of Higher Virtual Learning (HEL) had their perceptions on the usage of Virtual Learning Platforms (VLP) in the transition from face-to-face

to Emergency Remote Teaching analysed statistically (ERT). Teachers' perspectives on the academic environment caused by the COVID-19 crises were investigated for the transition of educational scenarios from school to home via VLP and support for teaching-learning knowledge of VLPs. They received training and the main issues encountered during the transition period. Data was collected for a statistical study using a devised instrument of convenience sampling (Data collection was designed through the Google forms application and distributed to public and private (HEL) teachers. The study found that more than 60% of respondents had used Moodle, Google Classroom, or Blackboard: 80% of professors had received virtual platform training from their school, and 60% of higher education institutions permitted them to choose the VLP⁷⁸.

Coupled with the above, a similar study employed education's digital competency (DC) as an individual characteristic construct of the task technology fit (TTF) theory to investigate a better fit between Moodle usage and task performance in a virtual learning environment using structural equation model analysis. An online survey of 238 teaching employees from various departments of Malaysian institutions was conducted to evaluate other offered hypotheses. Using Structural Equation Modelling, the analysis showed that all of the hypothesis components of digital competency (i.e., technology literacy, knowledge depth, presentation skills, and professional abilities) have a substantial impact on the (TTF). The task-technology fit was also revealed to be an influential factor that had a favourable and significant impact on Moodle usage and instructor task performance. Moodle usage has also been demonstrated to be significant. Limitations were discovered, as well as how the study's contribution can assist academics and practitioners in measuring and understanding what specific components of digital competency

impart TTF, which may influence the systems' use and performance⁷⁹. The independent and dependent factors in the reviewed and current investigations are similar, and the distinction is in their fields of study.

Similarly, another researcher investigated the level of digital competence of university Adriatic Bar students. The recently adopted Acton plan for digital education (2021-2027) and the latest EU guideline for implementing the digital competency framework identify two essential strategic priorities: encouraging the development of a thriving digital education ecosystem, developing digital skills and competencies for digital transformation, demonstrating the importance of high quality, inclusive, and affordable digital education in Europe. Today's primary concern in European higher education is how to manage the digital revolution. Montenegro is a European Union candidate country. This is thought to be a significant and intriguing study field. This article focuses on developing fundamental and advanced digital capabilities among university 'Adriatic Bar students, who are seen as Montenegro's and the EU's future workforce. The researchers concluded that today's digitalization directly impacts the modern labour market. As a result, it was recommended that young people in Montenegro obtain advanced digital skills to remain competitive in the EU labour market.⁸¹ The reviewed and contemporary studies have a lot in common. The distinction is that the reviewed study was conducted at a university, whereas the current study is centred of secondary schools.

Another study was conducted to assess the competency of secondary school teachers in Islamabad. A stratified random selection approach was used to choose the desired sample of 100 male and female secondary school teachers in Islamabad. A 20-item self-developed questionnaire was used to collect data. The data was analysed using a variety of statistical techniques. After evaluating the data using various statistical procedures such as ANOVA, the mean, standard

deviation, and person correlation coefficient were calculated. According to the findings, all of the components of teacher competency, including knowledge abilities and attitude, have a strong and positive link. On the other hand, female teachers were shown to have more excellent teaching skills than male teachers. Furthermore, private school teachers displayed higher teaching abilities than public school teachers. According to the study, teachers with fewer than five years of experience out performed their more experienced counterparts. It was suggested that workshops and training be provided for public school teachers to improve their teaching abilities, as well as incentives and awards for teachers with more than 5 to 10 years of experience to remain focused on improving their teaching abilities⁸⁴. Studies have a lot in common, however, differences existed, though, in their fields of study.

Furthermore, a researcher examined the socio-demographic variations in digital literacy among undergraduate students in Iranian university. The study sought to address a vacuum in the literature by looking into the relationship between digital literacy and socio-demographic parameters such as gender, access to digital resources, area of residence, the field of study, university level, and previous experience, respondents were chosen via quota sampling. Undergraduate students from levels 1-4 made up the sample, and each level has two public universities. The findings revealed that all socio-demographic characteristics substantially impacted students' digital literacy. The study aims to provide insight into Iran's education system so that it may identify areas of concern and implement required educational programs in the curriculum and extra-curricular areas to suit students' needs⁸².

Also, a study on managing teachers' digital competence for quality instruction delivery in secondary schools was conducted, emphasising the methods for managing teachers' digital

competence and the challenges faced by school administrators. The findings demonstrated that in any educational system, quality instruction in the classroom is dependent on qualified teachers, who are responsible for imparting the necessary information and abilities to help students establish a positive attitude toward learning. The study recommends organising workshops and conferences for teachers to expand their digital abilities, in-service training, and building communication networks are among the study's recommendations⁸³.

2.3.2 Virtual Classroom and Effective Teaching during COVID-19 Pandemic

A study assessed students' attitudes and feelings concerning sudden school closures during COVID-19. The study aimed to learn students' feelings and attitudes about schools closing unexpectedly during COVID-19. A web-based cross-sectional study was conducted using a modified version of the Advancement Emotional Questionnaire to examine students' positive and negative sentiments regarding schools. The poll was completed by 20697 pupils, with 83 per cent hailing from public schools and 80.6 per cent hailing from metropolitan areas. According to the data, students exhibited a satisfactory level of a positive attitude toward school and education throughout the lockdown, with a positive median of 31 and a negative median of 25.8. The analysis was then carried out to see which elements offer the most significant obstacle in the student's decision to study online. There were substantial social and lecturer difficulties; part of the recommendation is that learners should have been ushered to finish online learning through a mixed strategy in which traditional teaching is supplemented with online teaching⁸⁴.

Also, a study investigated online business education programs in Nigerian higher education institutions following the COVID-19 pandemic. Due to the lockdown, social isolation, and

adherence to all pandemic protocols, it was suggested, traditional teaching methods are inadequate for teaching and learning during and after the COVID-19. E-learning is considered by experts to be the best alternative, however in the educational field, traditional teaching methods still dominate, because of this, academics thought that the goggle classroom framework, E-learning, and virtual classroom, which have been popular in many nations across the world, may be the greatest alternative to and after the pandemic on Nigerian higher institutions⁸⁵.

Furthermore, study investigated on how to use a cloud-based portal to help technology lecturers in Nigerian colleges of education to improve their professional development and prepare for the virtual classroom. The study was directed by two hypotheses and research questions based on instructional delivery skills and peer collaboration. The study's participants were 81 technology educators from three Nigerian colleges of education. The data was gathered via a questionnaire. In addition, the respondents used a locally hosted cloud-based portal designed by the researcher, they placed it in the personal education computers to share their thoughts on instructional delivery and peers group cooperation. Respondents were given a three-week hand-on experience using the cloud-based portal before responding to the questionnaire. Study questions were answered using frequency counts, means and standard deviations. At the same time, the hypotheses were tested using ANOVA and t-test statistics. The study discovered, among other things, that the cloud-based portal's features, such as simple blogging, participation, communication access to rich content (downloadable/ linked), retrievability of instructional materials and secured communication tools for peer-to-peer interaction, among other things. Findings revealed that without a suitable and well-planned transition program, technology education would find the virtual classroom unpleasant, and students would be the ultimate

losers⁸⁶. This review and current studies have similar teacher competence, and the difference is in their area of study.

Another study reviewed online teaching during the COVID-19 pandemic in Zambian universities to explore the experience of lecturers in delivering lectures during the COVID-19 pandemic; to explore the lecturer's online teaching experiences with students interacting during the COVID-19 and the study employed a qualitative approach, the narrative design was largely dependent on primary data, the study employed a qualitative approach, the narrative design was largely dependent. It has turned out to be a blessing in disguise, since the institution will adopt a fully-fledged e-learning platform for all university programs, forcing lectures to shift from traditional teaching methods to new innovative online methods, instructions, and pedagogies. Lecturers initially reacted negatively to online instruction but eventually warmed up to it. Lecturers were constantly learning and improving their ability to create adequate information for teaching and learning⁸⁷.

In addition, a study of the impact of virtual classroom learning on students at federal and state colleges was done. The descriptive design was used, the study was conducted at two federal and state colleges in the southeast zone. Four research questions and four hypotheses led the investigation. A total of 506 students from 280 federal university students and 226 state university students were included in the sample. Because of the different ownership levels (federal and state), stratified random sampling was utilised. Students who had recently engaged in online programs and those who were now enrolled in the program were also used as examples. Students' permission was also requested prior to selection. The equipment was tested, and the

information gathered was examined. The findings revealed, among other things, that virtual classrooms have a favourable impact on federal and state university students, who expressed their continuous support and readiness for virtual classrooms⁸⁸.

Coupled with the above, during the COVID-19, investigation on students' attitudes toward learning were conducted. The survey aims to determine how university students feel about online learning and how satisfied they are with it. The survey method was used on 97 university students in Kuching to learn about their thoughts and satisfaction with four critical components of their emergency remote learning experience: learning materials, evaluation, communication, technology tools, and technical assistance. This study's findings show that most students have a positive attitude about online learning and are satisfied with it. this study discovered that taking into account the impacts of instructional pedagogy and effectively integrating technological resources can be highly beneficial in maintaining ongoing success in supplying learning content during the COVID-19 pandemic⁸⁹.

Another study was conducted on students' perception of virtual education platforms during COVID-19. The research was conducted quantitatively. Students from various universities in Chimborazo made up the non-probabilistic participatory sample. Data were collected with questionnaires with four variables; T student and MANOVA were used to analyse the data. Educational platform users are regarded to be optimistic. Students have a strong affinity for virtual classes, and the COVID- 19 pandemic may have pushed higher education institutions to adopt online learning⁹⁰.

Another related study, the researcher aimed to explore the effects of using virtual classroom in the developing the skills of digital applications. Data collected from undergraduate student at multimedia University Malaysian, convenience sampling and self-administered online surveys were used to understand the impact of virtual learning. 210 first year and second year degree and diploma responded to online survey. The study concluded that virtual teaching techniques have significant impact on students' performance⁹¹.

In addition, a study examined the perception and level of acceptance of the transition from offline to online learning among students of Punjabi University. A poll of 200 higher education students was used to conduct the research. A suitable pre-tested questionnaire was created on google forms. The students' audio and video quality perceptions were assessed using a five-point Likert scale. The data were decoded in SPSS using descriptive statistics and factor analysis. The study discovered that students found switching from traditional to virtual mode to be a difficult task. The investigation found that students have adopted both online and offline study modes depending on the availability of digital technology infrastructure⁹².

Furthermore, a study investigated the implementation of an online teaching programme through cross-sectional survey based on an observational study undertaken on 250 first-year medical students. The Kruska- Wallis H test, an independent t-test and an ANOVA with multiple comparisons post hoc Turkey test. Responses were gathered using a Likert scale from 1-5. The findings revealed that the traditional setup provided the best knowledge, convenience for attending class, note-taking, visibility, audibility, raising questions and overall experience. The lack of internet access was the main difficulty that hampered the online teaching experience.

While the majority of students believed that traditional classroom teaching is the best, they were also of the view that a combination of live online classes and power point presentations with voice-over can replace traditional classroom teaching,⁹³

A study explored an online survey of 307 students to understand better agricultural students' perceptions in India and preferences of students for various aspects of online classes to create a more successful online learning environment. The majority of respondents (70%) are willing to use online classes to continue their academics during the pandemic. According to the findings, the majority of the students opted to utilise their smart phones which were discovered through content analysis that students preferred recorded classes with a quiz at the end of each class to boost learning effectiveness. Students believed that online programs are appealing because of their flexibility and convenience but that broadband connectivity concerns in remote locations make it difficult for students to participate in online efforts⁹⁴.

The researcher investigated the obstacles and the implications of using e- learning platform in the context of English foreign language (EFL) teaching and learning in Saudi Arabia. This study looked at the pedagogical effectiveness of e-learning platforms, considering technological improvements and their impact on classroom education. The college has begun employing the blackboard collaboration software as an additional e-learning platform to improve the quality of instructions at all levels. A questionnaire was used in the study to acquire information about the perspectives and views of EFL teachers. The e-learning platform, according to researcher, is a potentially viable tool for putting learners at rest and establishing a stress- free environment. Training programs targeted at re-orienting teachers in the creative use of e-learning platforms

should be pushed further, according to the recommendation to establish a constructive teaching-learning environment in a technology-enabled classroom⁹⁵.

2.3.3 Collaboration and its Significant Effects on Student's Attitude

During the pandemic, the technical university of Cluj-Napoca, Romania, undertook a poll about students' behaviour and attitudes towards online learning during the pandemic. A total of 300 students participated in the event. Students' individual qualities, needs, and interests were surveyed, as well as their quality choices for online education and their understanding of how to use virtual platforms. 78 per cent of students believed that online education is beneficial to them. Overall, 41.7 per cent of students praised the teachers' ability to teach and the quality of the online courses, 18.7% of students valued the additional online materials. According to the recommendations, teachers should adapt their teaching methods and tactics to online education using digitalised learning methods and a new digital generation. The research described above is under goal Students favoured online assessment of an online collaborative traditional evaluation, although many found online instruction demanding⁹⁶. The reviewed and current research has much in common regarding students' attitudes but differ in their dependent variable

A study investigated how an online collaborative learning (OCL) programme on attitude towards technology in terms of technological anxiety, self-confidence and technology orientation among M.Ed. students. The study was carried out on 2 teacher training colleges in Israel for a period of 10 weeks based on the Tec model that used technology to increase trust between students from different culture through online learning students from intervention group(N=47) and control

group (N=45) completed questionnaires. Findings indicated a high level of online collaborative using which could increase self-confidence and technological linking⁹⁷.

Another closely identified study investigated the necessity of rethinking teaching learning and methods to incorporate teamwork and diversity awareness as part of students learning outcomes. With pre/post-intervention design, the study intended to construct a collaborative group-learning exercise and analyse its effects on students' views towards collaborative learning. Three questionnaires and semi-structured interviews were used to collect data from 84 first-year Israeli, Arab and Jewish students whose positive attitudes towards collaborative learning had declined. The partial least squares-Structural Equation Modelling (PLS-SEM) model revealed that students were favourable. The perception of collaborative activities directly impacted their attitudes towards collaborative learning regardless of cultural variations. The inclination of Arab students for openness to varieties, contributed to their positive attitude towards collaborative learning. Throughout the activity, students from both cultures characterised the group dynamics on their terms. The qualitative interview analysis showed numerous explanations for the students' issues during the collaborative activity⁹⁸.

A study examined teaching reading methods in two different collaborative and non-collaborative approaches to find out if the approaches have a different effect on reading comprehension and attitude toward reading in Iran language institute (ILI) 45 Iranian adult female EFL learners with a pre-intermediate general English competency level were chosen and divided into three groups of 15 students. The control group received no strategy instruction, the first experimental group, received reading strategy instruction in collaborative groups (Collaborative Strategic Reading or

CSR) and the second experimental group the instructions in a non-collaborative manner. All three groups were given a reading comprehension exam and exam and a reading attitude questionnaire at the beginning of the term as pretexts and after the trial as post-test. The outcomes of a one-way analysis ANOVA revealed that. In contrast, both experimental groups outperformed the control group; there was no significant difference in reading comprehension or attitude towards reading between the two experimental groups. Thus, the teacher needs to access the benefits of utilising a collaborative approach to reading instructive instructions against the drawbacks⁹⁹.

Furthermore, a study explored STEM (Science, Technology, Engineering and Mathematics) to investigate the influence of collaborative grouping on student involvement. The study took place in a rural and urban locations. A descriptive survey was used to acquire data, a student questionnaire, a semantic evaluation of teachers' observations and students' interviews. The information was divided into three categories Emotional, Cognitive and Teamwork. Qualitative research shows that students' self-reported preferences for collaborative learning are decreasing. The findings revealed that collaborative grouping improves student learning and supports social-emotional development. Thus, when events are preceded by deliberate group formation and education on how to participate, they are more likely to be successful¹⁰⁰.

A study investigated the influence of a collaborative learning intervention on students' self-efficacy, social skills and knowledge about mobile app development. The study enlisted twenty-nine undergraduate students' cooperation, who participated in a 12-week collaborative learning programme. The motivated strategies for Learning Questionnaire and the social skills inventory's

self-efficacy for learning and performance measures were used to assess students' self-efficacy in mobile app development and social skills, respectively. According to findings, a student's knowledge of mobile app development was accessed using the knowledge of mobile app evaluation from students' knowledge of mobile apps increased significantly. Collaborative learning, on the other hand, has a minor impact on a student's self-efficiency and social skills¹⁰¹.

In addition, a study examined a 9-week intervention in 10 classrooms (n=251) that engaged in cooperative learning modules to increase the collaborative nature of introductory undergraduate laboratory classrooms (promoting interdependence via modified jig saw techniques) students in a further ten classrooms (n=232) completed the identical material in an unstructured style, which is typical of educational practice. Intervention students did not score higher on weekly tests when class variance was adjusted. However, scientific curiosity and prior science experience in intervention classrooms had a reduced link to quiz performance. Intervention classrooms demonstrated greater collaborative involvement at the whole and individual levels. However, the intervention was only one of several characteristics that accounted for the late-intervention classroom; collaborative engagement at both the small and whole classroom levels may not be enough to boost student accomplishment on its own¹⁰².

2.3.4 Integrating Digital Technology in Virtual Classroom and its Effects on Student's Attitude

Corona-virus disease (COVID-19) had caused significant concern in the global education system. To reduce the spread COVID-19 pandemic, schools were shut down in over 100 countries, putting students out of school. A study was conducted to examine the Coronavirus'

effects on education. Data was gathered via standardized questionnaires from 200 respondents from various countries, including teachers, students, and law enforcement officials. Regression was used to analyze the data. The findings revealed that COVID-19 harmed education, including limited access to education and research facilities, increased student debt and educators' and students' reliance on technology to ensure continuous learning online during the COVID-19 Era. Poor infrastructure, such as a lack of network, power outages, inaccessibility and unavailability difficulties, and a lack of digital skills, have all hampered online education. Suggestions were given to educators and learners in educational institutions on adapting to technology and enhancing their digital abilities in light of emerging global trends and realities in education¹⁰³.

Virtual platforms (VPS) and how they are utilized for e-learning were explored in a study. It evaluates the difficulties students have when using virtual platforms for e-learning from the perspectives of students' abilities, institutional perspectives, and external aspects such as setting and context. Students face difficulties when utilizing e-learning. The study's participants were Ghanaian students enrolled in e-learning courses at colleges outside of Ghana. It is well acknowledged that e-learning students have used various computer systems. In this poll, respondents used two computer systems: open edx and latitude learning system. There are three categories of problems that have been identified:

1. Institutional issues (ineffective service provider orientation, system failures and speaking habits)
2. Technological challenges for students (how computer abilities and self-efficacy, inadequate knowledge and skills in the use of online handles and poor time management)

3. Environmental variables (lack of advanced technology devices to facilitate e-learning, lousy internet connectivity) It was suggested that various methods be implemented to ensure the success of e-learning on virtual platforms in Ghana, including implementing a well-structured and successful orientation program prior to embarking on the e-learning journey. There is a relationship between the two studies regarding virtual classroom aims, but there is a difference in their fields of study¹⁰⁴.

This research investigated the gap in determining the precise tactics students utilize to overcome online learning problems during the pandemic and how they cope with them. Students' types and severity of online learning challenges varied, according to the findings, which were based on a mixed-method approach. Their biggest roadblock was their home learning environment, but technical literacy and competency were the easiest to overcome. While most studies have found that technology use and proficiency are the most common obstacles students face in an online classroom, another researcher believes that the situation in developing countries during a pandemic is slightly different. According to studies, the learning environment is one of the most challenging students faced, with noticeable distractions at home (noise) and limited learning space and resources. According to the findings, students' online learning problems during the pandemic are distinct from those they confront in a pre-pandemic online learning environment. One possible explanation is that their movement was limited, making it impossible for them to travel to school or other learning facilities outside the immediate area¹⁰⁵.

A study analyzed the critical obstacles and factors influencing E-learning system utilization during the COVID-19 pandemic. Interviews were used in the study, and NVivo (a program used for qualitative and mixed-method research) was used to analyze the data. The interview was

conducted with 30 students and 31 specialists in the e-learning system from three institutions in Jordan and Saudi Arabia. The study's findings offer crucial advice for policymakers, planners, developers, and researchers interested in better understanding the major components of the E-learning system during the COVID-19 pandemic. Change management concerns e-learning system technical issues, and financial support issues are the three main challenges that obstruct the use of e-learning systems, according to the findings¹⁰⁶.

Also, a study investigated the relationship between students' self-perceived digital competencies, related attitudes, and level of self-direction in learning and how teachers viewed technology in the classroom (teaching and learning). The study used a cross-sectional design, with data collected in different sequences from a non-randomized sample of 200 undergraduate students divided into two groups (technical and non-technical specialists). The information was gathered through an online survey (using a questionnaire) and a focus group interview. According to the research, students' usage of digital resources for learning is related to their level of self-directed learning. Furthermore, students exposed to a high frequency and more complex use of technology due to their specialization are more likely than students majoring in the sciences and more likely to report a more favourable attitude towards digitalized learning than students majoring in social sciences. Furthermore, the higher the students' self-efficacy, the more self-directed their learning is. According to the findings, the higher one's self-efficiency, the higher one's self-perceived digital competencies are and how their self-perceived digital competencies correlate with their level of self-efficiency. Also, students with access to the frequency and modality of technology appear to be more satisfied with their learning. The need for a longitudinal study to determine the degree of association of the factors over time, as well as

strengthening students' digital competencies in specific academic contexts to boost academic achievement and encourage lifelong learning, are among the recommendations. The factors dealing with digital competencies are similar in the objectives, but the subject focus differs¹⁰⁷.

In addition, a study investigated university students' perception of online course technologies and how they can help the learning environment. The findings of a quantitative research study analyzing university students' views towards technologies utilized in online courses are presented in the paper. The online survey was completed by 496 students, 268 males and 228 females, using social networking sites (SNS). The researcher discovered that, due to the intricacy of the technologies utilized in these online courses, university students have difficulty using them and require additional training before using them. The data found that reading materials and online discussions were the most often used activities in university online courses. In contrast, other activities such as audio, social networking, online conferencing and games were not generally used¹⁰⁸.

Also, a study examined how using web 2.0 technologies in the classroom affects teachers' and students' attitudes regarding using technology and instructional materials using the Technology Acceptance Model (TAM). A training program was given to 46 teacher applicants from various departments using a quasi-experimental research design and semi-structured interviews for data collection. The quantitative data obtained were analyzed using a sample T test with SPSS 15.00. The qualitative data were subjects to an analysis of the content teacher's and students' opinions on technology usage. The usage of instructional materials $t(45) = 3.58, p.01$ was observed,

showing a significant difference before and after the training. Teachers and students pointed out that the use of technology in the classroom environment is a necessity¹⁰⁹ .

Furthermore, study examined why the affective attitudinal component has been the primary focus of research into the attitude towards technology education. The research investigated how a two-step approach can combine technology education's affective, cognitive and behavioural aspects. The study used the (PATT-SQ-SE) instrument, including the MIT-SQ technology. The findings shows that the relationship among attitudinal components is observable; individual interest in technology education was linked to both the cognitive and the emotional aspects and the intention to act in a certain way for girls; another significant association was that of cognitive component exhibited a substantial link to behavioural intention, whereas boys did not. Student's interest in technology should be pursued to a higher degree by engaging in tasks and technology education that can excite their brains¹¹⁰ .

As if the above were not enough, a study examined the usage of technology in online courses. Ninety-six undergraduate students were surveyed about the devices they utilized and how they felt about them. The poll also assessed students' involvement, drive, procrastination, stress, perception and self-efficacy. Along with their current grade, the survey also asked students how to rate how satisfied and how they felt in their classes. Course outcomes and individual difference indicators showed predictable relationships. Even while laptops were mostly associated with few feelings of loneliness. Regression analysis demonstrated that perceived stress reliably predicted all outcomes and that smart phones used accounted for the distinctive

variation in isolation between laptops and smart phones. The findings suggest that academics in the present-day value work, having more smartphones¹¹¹.

A study looked into the ways that mobile apps support student collaboration, interaction, and learning outcomes using the mixed-methods. Convenience sampling was used to find a total of 160 respondents from a university in Lithuania. A survey was undertaken to investigate the often-occurring interaction, collaborations and learning performance. To find out which applications were used during their encounters, focus groups were also interviewed. Findings revealed that smartphone apps encourage students' interaction, teamwork, and better learning outcomes. Qualitative findings point out to three categories of apps- educational, communication, and entertainment- that undergraduates of Lithuania frequently utilize for social interactions. The result implied that instructions can assist in mediating how students interact with smartphone apps. As a result, the study gives teachers room to develop their pedagogical approaches and better to take into consideration their students access to smartphone apps, the study intended to point to educators and practitioners in the direction of educational solutions¹¹².

In addition, a study examined the attitudes and levels of technology coaches used in individual and team sports regarding athlete education. A convenient sample strategy reached the study group of 205 people. T-TAM (Teacher Technology Acceptance Measure was used, and it has 38 components and 11 sub-dimensions. A generated reliability coefficient of =0.94 was employed using an online questionnaire; participants were polled. Analysis was conducted using parametric tests, which indicated that the third-level coaches could be employed more than their first and second-level counterparts; they used technology in training and tournaments. Thus, having a positive attitude towards technology and using it to its full potentials¹¹³ .

The researcher examined students' arguments for forcing mobile phone technology to learn English in Badung regency and Denpasar city. Four hundred thirty-nine students from three different levels of schooling participated in the study. A five-point rating scale survey was designed and administered to a sample of students from various educational levels (junior high school, university and polytechnic). Results were elaborated using a descriptive approach. The findings revealed that learners favoured tiny gadgets with internet connectivity which aided and guided them through the session and also created a hybrid of digital tools and small gadgets to improve students' interest in English classes¹¹⁴.

Similarly, a study investigated the effect of digital text reading on comprehension, fluency and attitude of 4th grade students. The study used the mixed-method approach, combining qualitative and quantitative research approaches. A pre-test was used to determine the reading level of 75 pupils from primary schools, and 30 students with the lowest score were chosen. An experimental and control group were produced, randomly assigning students to one of two groups. There were 15 students in each group. The quantitative findings revealed that using digital texts improved fluency and reduced reading errors but had no effect on comprehension and was only temporary. Students were eager and excited to qualitative data indicating that if technology devices are inevitably influencing educational environments, thus it is critical to employ them in a planned and suitable manner. Teachers use digital texts with reading exercises to help students develop their reading skill and have positive attitudes toward learning¹¹⁵.

Additionally, a study explored the relationship between students' digital literacy and their attitude towards utilizing ICT in a private secondary in Karachi, Pakistan. Information for this study was

acquired from several sources using a google forms survey questionnaire created with a google forms. The size of the study's whole sample is almost equally distributed male and female students made up of 344 secondary school students. The use of bivariate correlation revealed a link between students' digital literacy and their view of information and communication technologies (ICTs) and other ICTs demographics in the area. Multiple linear regression analysis conducted in further analysis revealed the usage of tablet or smart phone, having prior experience in digital literacy and students' attitudes towards computer and their usage of them frequently are greatly influenced by ICT¹¹⁶ .

Research on university medical staff's experiences, problems, and acceptance of e-learning as a teaching tool during the COVID-19 pandemic, was done to find out what factors influence acceptability and usage of e-learning as a teaching tool in higher education. For studying aspects that affect the acceptability and usage of e-learning as a teaching tool, data was collected utilizing an electronic questionnaire with a validated Technology Acceptance Model (TAM). The findings reveal that (88%) of staff members who employ technology skills to provide online courses boost the educational value of their experiences. On the perceived utility, ease of use, and acceptance of learning, 77.1 per cent, 76.5 per cent, and 80 per cent concurred. Insufficient/unstable internet access (40%) was mentioned as a hindrance, as was an inadequate laboratory (36%) and a lack of computers/laptops (32 per cent). The most critical factors influencing e-learning acceptability are technological issues (32%), learning experiences, and younger age. The findings will aid in developing a strategic plan for the successful acceptance of e-learning and a positive perspective of technology as a step toward growth and progress¹¹⁷.

2.3.5 Availability, Adequacy and use of Digital Technology for Teaching and Learning in Secondary Schools

A researcher examined the relationship between students' attitudes towards using ICT and their level of digital literacy in a private school in Pakistan. Data were gathered for this study, utilizing a survey questionnaire and Google forms. 344 secondary school students made up the entire sample size for this study, with a nearly equal number of male and female participants. Bivariate correlation analysis revealed a link between students' attitudes towards using technology and their level of digital literacy, demographics connected to (ICT) and other related fields. Additionally, research utilizing multiple linear regression analysis revealed that students towards using (ICT) strongly influenced by digital literacy (DL), use of tablet and smart phones prior computer training, frequency of computer use and use of computer¹¹⁸ .

An article was done on the difficulties students encountered in performing online classes in the middle secondary school in Thimphu District, Bhutan, during the COVID-19 pandemic. The study used a mixed-method approach, the semi-structured interview to gather qualitative data, a questionnaire to gather quantitative data, and a semi-structured interview for qualitative data. Ninety-two students from grades nine and ten for this study made up the respondents based on the purposive random sampling technique SPSS was used to analyze the data using descriptive statistics expressed as percentages. In contrast, the content analysis method was used to assess the qualitative data. The study revealed that the absence of modern amenities like the internet, smart phones and laptops during COVID-19 hurt online learning. Teachers, policymakers, and the ministry of education were provided helpful advice based on the study's findings for maintaining smooth online teaching and learning¹¹⁹ .

The study of secondary school teachers' digital competency during the COVID-19- pandemic was conducted to determine the degree of digital competence of secondary school teachers in various areas of knowledge. A cross-sectional descriptive quasi-experimental study was conducted using a random sample of secondary school teachers from various specializations. The findings revealed that the degree of understanding and usage of digital technologies is poor; nonetheless, one of the recommendations is to construct continued education plans for secondary school teachers to increase their digital skills. The outcomes of this study open the door to developing educational interventions aimed at improving teachers' digital competency¹²⁰ .

A study investigated the availability, adequacy and effective utilization of ICT resources by practising pre-service science teachers in secondary schools in Jalingo, Taraba State, Nigeria. The research aims to solve some of the world's problems in high school ICT through tertiary institution involvement in teacher education. The study was designed as a descriptive survey; ten secondary schools and 103 teaching practice science teachers used descriptive statistics, person productive movement correlation and partial correlation coefficient to examine the data correlation. Findings revealed that ICT resources are scarce and inadequate. There is also a strong positive relationship between adequacy and availability and the use of ICT resources. This suggests that merely developing ICT resources is insufficient but also makes them sufficient and available to teachers¹²¹.

A research work investigated the adequacy and use of ICT facilities in public senior secondary schools in Osun State for teaching and studying business subjects. The study employed a mixed-

method research approach that included the distribution of questionnaires and executing follow-up interviews. Despite the heralded introduction of computer tablets supposedly available to all senior secondary school students in the state, the result shows that ICT facilities are scarce, insufficient and largely under-scrutinized in teaching business subjects in public secondary schools in Osun State. It recommended that government and other educational stakeholders offer to functioning ICT facilities and personnel in public secondary schools¹²².

Furthermore, a study examined the efficient usage of ICT in the Nigerian educational sector for teaching and learning. Two hundred eighty respondents were randomly recruited and selected. A Likert- scale questionnaire was created, validated and distributed to the participants through random sampling techniques; data was collected, processed and analyzed using independent t-test statistics. Hypotheses were developed and tested using a critical t-test at the 0.05 level of significance; the value is 1.96. It was determined based on the findings that the availability of ICT tools and facilities and ICT integration were significant in educational institutions. It recommended that the government should make available ICT technologies in the classroom¹²³.

Coupled with the above, a study investigated how frequently teachers use digital technology in their classrooms and which student learning activities teachers initiate; also, it looked at aspects related to technology usage with a sample of 410 teachers who represented the state of Bavaria in Germany. The study revealed that they spend significant time in a typical session utilizing digital technology. Teachers' basic digital and technology-related teaching skills are more important than digital technology tools. While a certain amount of digital technology is required in schools,

findings suggest that the focus be shifted from classroom equipment to teachers' ability to properly use technology¹²⁴ .

In another related study, a researcher examined the availability and adequacy of ICT facilities in physics teaching and learning in a technical school in Benue State, Nigeria. The study used a survey research approach. Physics teachers and 9684 part 2 students were included in the study. The data-gathering instrument was a checklist for ICT Availability and Adequacy. Experts confirmed the instruments' accuracy. Data were analyzed using descriptive statistics of mean and standard deviation. Findings revealed that ICT facilities for teaching and learning are available among the technical schools in the study area. The study also found out that the available resources are insufficient, indicating that physics education and learning in Benue State lacked suitable ICT facilities¹²⁵.

Additionally, a study examined the activities carried out during COVID-19 using digital technology as well as teaching and learning philosophies that reflect the frequency of teaching activities, the researcher created an online questionnaire using a Likert scale. It was answered by 1,403 Spanish teachers (734 primary and 669 secondary education teachers). The proposed activities vary based on the type of learning (reproductive or constructive), the learning outcome (verbal, procedural or attitudinal), the type of evaluation used and the existence of cooperative activities. Findings revealed that teachers engaged in more reproductive behaviours than constructive ones. Indicating that ICT is used for reproductive rather than constructive purposes make it difficult to effectively integrate digital technologies into the curriculum so that students can learn 21st-century skills¹²⁶ .

Furthermore, a researcher investigated ICT resources that may be used to improve teachers' delivery of instructions in private secondary schools in the Port Harcourt Metropolitan Area. Investigating the accessibility, suitability and application of ICT resources for boosting teachers' delivery of teaching in the classroom was the goal of the study. A descriptive survey design was used. The study's participants were all private secondary school students and teachers, the sample was chosen in a multistage sampling method, ten private secondary school students from each of Port Angeles', two local governments were chosen and 160 teachers randomly selected. 80 male and female, from each of the 10 schools sampled. A self-structured checklist/questionnaire was utilized. The instruments internal consistency was determined using the Cronbach Alpha reliability Coefficient, which produced reliability indices of 0.086, 0.085 and 0.077, Z- test was used to access the data using percentages, mean and standard deviation was employed to list the theory at a 0.05 significant level. The result of this study demonstrates the availability of ICT tools for increasing teachers' delivery of instructions in private secondary schools including laptop, computers, printers, internet access, power point projectors, radio and television sets and educational software. Secondly the result showed that among other things, smart phones, radio and televisions are suitable for delivery of teaching by teachers in private secondary schools. Consequently, it was advised that administrators of private secondary schools increase the supply of ICT resources for distribution of teaching. Additionally, teachers' abilities to use ICT resources should be developed¹²⁷ .

In a related study, a researcher examined how ICT resources were used in several public secondary schools in Rivers State to improve teaching and learning outcomes in the twenty-first

century. The descriptive survey design method of investigation was used. A questionnaire was used to analyze the study while mean was used to analyze the result in addition to the standard deviation while analyzing research questions. The overall number of students in the school was 247, the total number of teachers was 8234, 35 schools were chosen for the research the study's sample size was 350. Among the target sample population, 150 questionnaires were distributed; 100 for the teachers and 50 for students. The result showed that the only ICT resources accessible in the school are under after review, none of the other specified products were available, ICT resources were not used to ensure quality in the classroom of the twenty-first century in public schools¹²⁸.

2.4 Conceptual Model

The conceptual framework captures the independent variables namely digital teacher's competence: communication, commitment and collaboration and virtual classroom management: planning, organizing and directing. Dependent variable: students' attitude to learn; readiness, patience and self- discipline. Moderating variables: gender: female and male, and school type: public and private. The relationship between the independent and dependent variables are shown and how they are linked together. These concepts are examined;

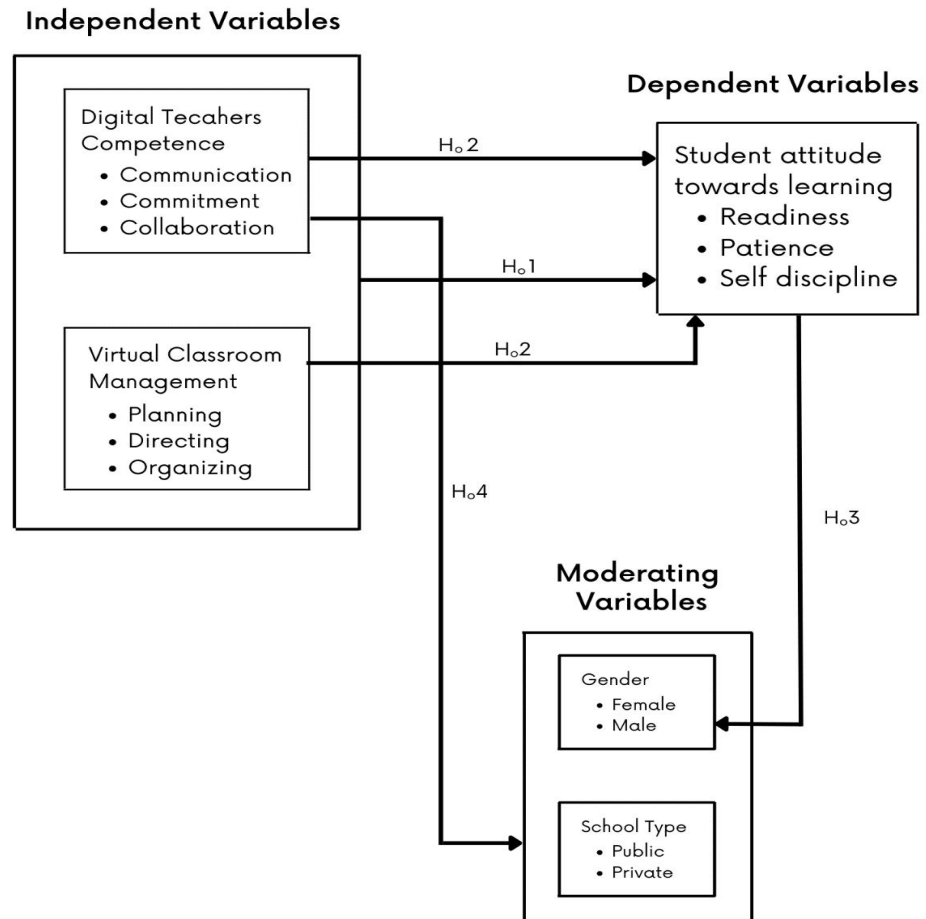


Figure 2.3 shows the directional movement of the independent and dependent variables.

Source: Researcher.2023

Fig2.3 shows the independent variables which are digital teacher's competence and virtual classroom management having impact on students' attitudes towards learning during the COVID-19 Era which is the dependent variable, the implication of this is that when teachers are competent in the use of digital platforms managing of virtual classroom learning will be effective, thus, students' interest will be ignited, their positive attitude toward learning will be enhanced, but where the teachers show some level of incompetency, it will certainly affect the students' attitude to learning. This suggests that the dimensional movement could be positive or negative depending on the independent variables.

2.5 Summary of Gap in Literature Reviewed

This chapter deals with the study's literature review during the COVID-19 Era, the review looked at the conceptual framework as well as numerous concepts such as digital teacher competency, digital teacher, virtual classroom management, and secondary school students' attitude toward learning. Siemen and Downen anchored and conceptualized Connectivism which posited that learning happens when students connect, cooperate to share ideas, opinions and viewpoints, while Lee.S. Shulman's notion of Technological, Pedagogical, and Content Knowledge (PCK) (TPACK) was reformulated by Punya Mishra and Mathew J. Koehler which explained the set of knowledge that teachers needed to teach their students effectively using technology. The numerous researchers examined the criticisms and relevance of the theories to the study, important topics related to digital teachers' competence, virtual classroom management, and students' attitudes toward learning are also identified and discussed.

Empirical study reviewed include digital teachers' competence and students' attitude to learning, virtual classroom and effective teaching during COVID-19, collaboration and its significant

effects on students' attitude, integrating digital technology in virtual classroom and its effects on students' attitude, availability, adequacy and use of digital technology for training and learning

However, the current study focusses on some knowledge gaps, particularly with regard to the concept of teachers' digital competency, virtual classroom management: virtual platforms, students' attitude toward learning in the COVID-19 Era. Thus, this study intends to fill a knowledge gap by identifying the different platforms used for learning, the rules guiding the use of the platforms the challenges that teachers and students faced while using virtual classrooms learning in the COVID-19 Era

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Chapter Three

Methodology

This chapter presents the methodology that were used in this study. It includes the research design used, the population of the study, sample, and sampling techniques, instrumentation, validity and reliability of the instrument, method of data collection methods of data analysis.

3.1 Research Design

This study adopted a descriptive survey research design to determine the digital teachers' competence and virtual classroom management on secondary students' attitudes towards learning in the COVID-19 Era in Lagos State. The advantages of the design were its robustness with respect to the distribution of data: it was easy to compute the detailed information that was derived from the test, used in studies for which parametric assumptions cannot be met, and its flexibility in handling data. This design was also suitable since the researcher did not intend to engage in any form of manipulating variables in any way,

3.2 Population of the Study

The population of the study comprised all students in senior secondary school and teachers who taught in the three hundred and twenty-three (323), public schools, one thousand seven hundred and eighty-eight (1788) private secondary schools, 8840 public teachers, 43249 private teachers, 234,611 students in public schools and 118,785 students in private schools in the twenty local government which were structured into six educational districts in Lagos State. Specifically, Senior Secondary School Two (S.S.S 2) were chosen for the study's population. The choice of SSS2 was not unconnected to an assumption of the researcher that these students have spent a good number of years in the secondary school system and had inept knowledge of the situation

as regards digital teachers' competence and virtual classroom management. These groups of students were also not in their terminal classes preparing for external examinations. Hence, they were considered the best choice for this study. Numerical Representation and distribution of the study's population is presented in table 3.1 below.

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Geographical Structure of Secondary School in Lagos State	Local Government	Senior Secondary Public School	Number of Teachers	Number of Student
Education District 1	Agege	8	283	9060
	Alimoso	25	904	28199
	Ifako-Ijaye	8	335	8630
Education District 2	Kosofe	14	472	10405
	Ikorodu	28	1008	24138
	Shomolu	10	272	8405
Education District 3	Epe	27	447	11752
	Eti-Osa	19	313	9133
	Lagos Island	11	214	5901
	Ibeju- Lekki	9	139	4733
Education District 4	Surulere	29	675	20190
	Apapa	6	138	5775
	Lagos Mainland	10	240	6768
Education District 5	Amuwo-Odofin	20	392	6493
	Ajeromi/Ifelodun	20	370	14149
	Badagry	14	467	15375
	Ojo	15	555	13961
Education District 6	Oshodi/Isolo	22	684	13754
	Mushin	16	468	9677
	Ikeja	12	460	8383
Total	20	323	8840	234,611

Table 3.1: Total Number of Teachers and Students in Public Schools

Source: Lagos State Ministry of Education

Table 3.2: Total Number of Students and Teachers in Private Schools

Geographical Structure of Secondary School in Lagos State	Local Government	Senior Secondary Private School	Number of Teachers	Number of Students
Education District 1	Agege	54	1212	4634
	Alimoso	411	11611	25804
	Ifako-Ijaye	97	3179	7612
Education District 2	Kosofe	102	2548	7716
	Ikorodu	166	3122	9493
	Shomolu	26	930	3867
Education District 3	Epe	13	203	1157
	Eti-Osa	76	1145	4268
	Lagos Island	11	879	1591
	Ibeju- Lekki	19	3061	1569
Education District 4	Surulere	76	1737	5618
	Apapa	19	329	1564
	Lagos Mainland	36	1111	3748
Education District 5	Amuwo-Odofin	61	1530	4324
	Ajeromi/Ifelodun	42	1979	5518
	Badagry	47	1037	3177
	Ojo	190	4654	9898
Education District 6	Oshodi/Isolo	131	2689	7960
	Mushin	141	1755	5402
Total	Ikeja	68	1078	4177
	20	1788	43,249	118,785

3.3 Sample and Sampling Techniques

Multi-stage sampling procedure that contains different sampling techniques was used to select a portion (sample) of the population which participated in the study. The sample was selected in such a way that everyone stands equal chance of being selected. At first, Lagos State was stratified into six using the existing educational districts 1 -6. Secondly, one local government was chosen from each district using a simple random sampling technique. These are District 1, Agege Local Government: District 2, Ikorodu: District 3, Lagos Island: District 4, Lagos Mainland: District 5, Amuwo- Odofin: and District 6, Ikeja Local Government. At the third stage, the local government with the least number of schools among the selected local government were used as benchmark to ensure uniformity. Therefore, for public schools, Agege with eight (8) public schools, was used as the benchmark for all the public schools while Lagos Island, with eleven (11) schools was used as the benchmark for private schools. See (Table 3.2) for details. At the fourth stage, the Taro Yamane formula $n = \frac{N}{1 + N(e)^2}$, where n signifies the sample size, N signifies the population under study, and e signifies the margin error (0,05), were used to determine the sample size (students and teachers) in each local government while simple random sampling was used to select Senior School Two (SSS2) students. These students were selected on the ground that they are assumed to be matured and have spent a reasonable number of years in secondary schools and are not preparing for external examinations. Therefore, they are likely going to give useful information about virtual classroom experiences during the COVID-19 Era. Also, simple random sampling technique was used to select teachers in the sampled schools.

Table 3.3 Number of Selected Schools and Students in Public Schools

District	Selected LGA	No. of Schools	No. of Selected Schools	No. of Students in the Schools	No. SSS 2 Students in the Selected Schools	Sampled Using Taro Yamane Formula
1	Agege	54	11	1212	110	18
2	Ikorodu	166	11	3122	283	47
3	Lagos Island	11	11	879	88	12
4	Lagos Mainland	36	11	1111	111	19
5	Amuwo-Odofin	61	11	1530	139	23
6	Ikeja	68	11	1078	98	16
Total	06	396	66	8932	829	135

Source: Fieldwork, 2023

Table 3.4 Number of Selected Schools and Students in Private Schools

District	Selected LGA	No. of Schools	No. of Selected Schools	No. of Students in the Schools	No. SSS 2 Students in the Selected Schools	Sampled Using Taro Yamane Formula
1	Agege	54	11	1212	110	18
2	Ikorodu	166	11	3122	283	47
3	Lagos Island	11	11	879	88	12
4	Lagos Mainland	36	11	1111	111	19
5	Amuwo-Odofin	61	11	1530	139	23
6	Ikeja	68	11	1078	98	16
Total	06	396	66	8932	829	135

Source: Fieldwork, 2023

Table 3.3 and 3.4 presents number of selected local government in each district using simple random sampling technique. The table also presents number of schools selected in each local government that represent the districts using the aforementioned benchmark. Also, the table presents the number of all the selected schools and Senior Secondary School Two (SSS 2) students in each local government. Similarly, the table presents the sample size in each local government using Yamane formula.

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Table 3.5 **Number of Sampled Teachers in Public Schools**

S/N	LGA	No. of Schools	Selected Schools	No. of Sampled Principals	No. of Teachers	Sample Using Taro Yamane
1	Agege	8	8	8	35	32
2	Ikorodu	28	8	8	126	100
3	L/Island	11	8	8	27	25
4	L/Mainland	10	8	8	30	27
5	Amuwo	20	8	8	49	45
6	Ikeja	12	8	8	58	53
Total		89	48	48	325	282

Source: Fieldwork, 2023

Table 3.6 **Number of Sampled Teachers in Private Schools**

S/N	LGA	No. of Schools	Selected Schools	No. of Selected Principals	No. of Teachers	Using Taro Yamane
1	Agege	54	11	11	396	198
2	Ikorodu	116	11	11	863	270
3	L/Island	11	11	11	144	106
4	L/Mainland	36	11	11	340	170
5	Amuwo	61	11	11	393	200
6	Ikeja	68	11	11	374	187
Total		342	66	66	2510	1311

Source: Fieldwork, 2023

Table 3.5 and 3.6 presents sample and sampling procedure of teachers and principals who participated in the study. The table showed that six local governments across all districts using simple random sampling technique. The table also revealed the number of schools in each selected local government, the number of selected schools using the earlier stated benchmark, the total number of teachers in the selected schools and sample size using Taro Yamane formula and finally it presents the number of sampled principals.

Table 3.7 Summary of Sample Frame

District	LGA	Public Schl	Private Schl	Selected Std. Public	No. of Sampled Principals Public	No. of Sampled Principals Private	Selected Std. Private	Selected Teachers. Public	Selected Teachers. Private
1	Agege	8	11	159	8	11	86	32	198
2	Ikorodu	8	11	273	8	11	163	100	270
3	L/Island	8	11	128	8	11	72	25	106
4	L/Mainland	8	11	140	8	11	87	27	170
5	Amuwo	8	11	141	8	11	103	45	200
6	Ikeja	8	11	158	8	11	78	53	187
Total	6	48	66	999	48	66	589	282	1,331

Source: Fieldwork, 2023

Table 3.7 presents the sample frame of the study. It showed that the study involved all the six educational districts from which six local governments, forty-eight public schools, sixty-six private schools, nine hundred and ninety public school students, one hundred and thirty-five private school's students, two hundred and eighty-two public school teachers and one thousand, three hundred and thirty- one private school students were selected for the study.

3.4 Research Instruments

Quantitative and qualitative data were collected for this study. For quantitative data, two sets of questionnaires were developed and divided into three sections for students and four sections for teachers, and for the qualitative, structured interview questions for school principals. The teachers' questionnaire is titled Digital Teachers Competence Virtual Classroom Management tagged (DTCVCM) These instruments were divided into sections, namely, section A, B, C, and Section D semi-structured interview guide questions for school principals. Section A of (DTCVCM) consists of the demographic information of the respondents such as the, subject taught, gender, educational qualifications, years of teaching experience. Section B1 and B2 of (DTCVCM) items 1-31 measured virtual classroom platforms, virtual classroom management, challenges faced by teachers and students during and after lockdown. In the section, items 1-4 measured commitment as index of digital teacher competence, item 5-8 measured collaboration and 9-12 measured communication. Also, items 13-16 measured planning as index of virtual classroom management, 17-20 measured organizing while 21-24 measured directing. Furthermore, items 25-29 measured level of teacher's compliance to the use of rules and regulations of virtual classroom learning, item 30 measured the most frequently used virtual classroom platforms, item 31, measured the obstacles experienced in using virtual classroom platform, while section B (2) contains items on after lockdown. Section C were instruments for teachers to test the hypotheses. Items 1-3 on collaboration, 4-6 commitment, 7-9 communication, 10-12 planning, 13-15 organizing, 16-18 directing. Responses were rated using Strongly Agree (SA)=4points, agree(A)= 3points, disagree(D)= 2 points, Strongly Disagree (SD)= 1point. Section D were structured interview for selected school principals on digital teachers' competence, virtual classroom management, challenges faced by teachers and students as well as different types of virtual classroom platforms

used and rules guiding the use of virtual classroom platforms. This is to solicit more information to achieve the stated objectives of the study.

The student's questionnaire (SATLCE) was divided into Section A, and B. Section (A) was the demographic information on respondents: gender, age, and school. Section(B 1) were the students questionnaire titled students attitude to learning in the COVID-19 Era items 1-4 measured readiness, 5-8 measured self- discipline, items 9 -12 measured patience while items 13 -16 measured level of compliance to rules guiding the use of virtual classroom learning, item 17 measured challenges experienced during virtual classroom learning, with item 18 which measured the most frequently used virtual platform, all responses rated using the rating scale Often (OFT) =4, Seldom (SLD,) =3, Rarely (RAL) =2, Never (NEV) = 1

Section (B2) were instruments on students' attitude to learning after COVID-19. items 1-4 measured readiness, items 5-8 measured self- discipline, items 9 -12 measured patience while items 13 -16 measured level of compliance to rules guiding the use of virtual classroom learning after COVID-19, item 17 measured challenges experienced after COVID-19, all responses rated using the rating scale. At all times (AAT)=4, Sometimes (ST) = 3, Rarely= (2), Not at all (NAL) =1. Item 18 measured the most frequently used virtual platforms with the rating scale Often (OFT) =4, Seldom (SLD,) =3, Rarely (RAL) =2, Never (NEV) = 1

3.5 Validity of the Instrument

Face and content validity tests were conducted on the survey that was used in this study. The supervisor carefully examined the research tools, examining their organization, sufficiency, and content. Additionally, experts in item generation in the Faculty of Education, Lead City

University and Examination Development. Department, National Examinations Council (NECO) were contacted. Identified errors were effected before the administration.

3.6 Reliability of the Instrument

The researcher subjected the questionnaire to a reliability test to check the internal consistency of all items in the study. The reliability of the instrument was done through a pilot study using (30) copies of the questionnaire, which were administered to teachers and students in senior secondary schools that were not involved but believed to share similar characteristics with the study population. Cronbach's alpha reliability techniques was used to estimate the internal consistency, those not attempted were removed or rewarded to obtain good items.

3.7 Administration of Instrument

After obtaining a letter of authorization from Lead City University, the researcher, along with four trained research assistants to. the selected respondents, this was done to ensure that the respondents themselves filled out the instruments and to decrease the amount of missing data.

3.8 Method of Data Analysis

Descriptive and inferential statistics were used to analyze quantitative data collected from the field. Descriptive statistics such as frequency count, simple percentages, mean and standard deviation were used to analyze data collected on demographics of the respondents and research questions. Inferential statistics of multiple regression analysis were used to test hypotheses 1 and 2, while t-test statistic was used to test hypotheses 3 and 4 at 0.05 level of significance. Also, content qualitative, content analysis was used to analyze information collected from the respondents

Chapter Four

Result and Discussions of Findings

This chapter present the data collected with the questionnaire and interview technique responses collect during the study and analysed with different descriptive and inferential statistics to find answers to each question, test hypotheses and transcribed responses from the school administrators

The chapter is represented in the following subsection:

- 4.1 Questionnaire Returns/ Responses Rates
- 4.2 Demographic Data Analysis
- 4.3 Presentation of Data
 - 4.3.1 Presentation of Answers to Research Questions
 - 4.3.2 Test of Hypotheses
 - 4.3.3 Analysis of Qualitative Findings
- 4.4 Discussions of Findings
- 4.1 Questionnaire Return Rates**

One thousand five hundred and ninety- five (1595) copies of the questionnaire were distributed to the students on the field,(1495) one thousand four hundred and ninety- five retrieval were achieved representing (91.7%) while one hundred (100) representing (6.3%) were not retrieved.(1431)One thousand, four hundred and thirty- one copies of the questionnaire were

distributed to the teachers', nine hundred and thirty- five (935) were retrieved representing (65 %) while(496) four hundred and ninety- six (34.1% were neither filled nor returned)

4.2.1 Demographic Data Analysis

This section represents demographic information of respondents

Table 4.2.1 Local Government Area of Respondents

	Frequency	Percent
Agege	118	12.6
Ikorodu	205	21.9
Lagos Island	113	12.1
Lagos Mainland	139	14.9
Amuwo-Odofin	200	21.4
Ikeja	160	17.1
Total	935	100.0

Source: Fieldwork, 2023

Table 4.2.1 and figure 1 (see Appendix iv) presents the distribution of teacher respondents across various Local Government Areas (LGAs) in Lagos State where the study was conducted. Among the surveyed teachers, the largest number hailed from Ikorodu, comprising 21.9% of the total respondents. Amuwo-Odofin and Ikeja also saw substantial participation, accounting for 21.4% and 17.1% respectively. Meanwhile, Agege, Lagos Island, and Lagos Mainland contributed 12.6%, 12.1%, and 14.9% of the total respondents, respectively. These figures indicate a broad geographic representation, suggesting that teachers from different areas of Lagos State were engaged in the research. This distribution underscores the study's potential to capture a wide range of perspectives and experiences, enhancing the robustness of the findings in the context of the influence of digital teachers' competence and virtual classroom management on students' attitudes towards learning during the COVID-19 Era.

Table 4.2.2 Gender of Teachers Respondents

	Frequency	Percent
Male	449	48.0
Female	486	52.0
Total	935	100.0

Source: Fieldwork, 2023

The gender distribution of the teacher respondents in the study presented in table 4.2.2 and figure 2 (see Appendix v) reflects a relatively balanced participation. Among the surveyed teachers, 48.0% identified as male, while 52.0% identified as female. This equitable representation of both genders suggests that the study has taken into account a diverse range of perspectives and experiences. This gender balance is crucial as it helps ensure that the findings and conclusions of the research are more likely to be applicable and relevant to both male and female teachers. It also underscores the comprehensive nature of the study, allowing for a well-rounded exploration of the influence of digital teachers' competence and virtual classroom management on students' attitudes towards learning during the COVID-19 Era.

Table 4.2.3 Age of Teacher Respondent

	Frequency	Percent
20-30	122	13.0
31-40	420	44.9
41-50	252	27.0
Above 50	141	15.1
Total	935	100.0

Source: Fieldwork, 2023

Table 4.2.3 and figure 3 (see Appendix vi) presents the age distribution of the teacher respondents that participated in the study. The result revealed that the majority of the teacher respondents fall within the age range of 31 to 40, comprising 44.9% of the total. Following this, the age group of 41 to 50 accounts for 27.0%, while respondents aged 20 to 30 make up 13.0% of the total. Additionally, teachers above the age of 50 constitute 15.1% of the total teacher

respondents. This age diversity demonstrates that teachers across a broad spectrum of career stages participated in the research. The prevalence of teachers in the 31-40 age bracket possibly suggests a balance between experienced teachers and those relatively newer to the profession. The distribution across age groups ensures that the findings of the study are likely to capture perspectives and experiences from various stages of teaching careers. This comprehensive representation strengthens the study's exploration of how digital teachers' competence and virtual classroom management influence secondary school students' attitudes towards learning in the COVID-19 Era.

Table 4.2.4 Marital Status Teacher Respondent

	Frequency	Percent
Single	205	21.9
Married	730	78.1
Total	935	100.0

Source: Fieldwork, 2023

The marital status distribution of the teacher respondents presented in table 4. 2.4, Figure 4 (see Appendix vii) provides valuable information about the personal backgrounds of the teacher participants in the study. Among the surveyed teachers, the majority, 78.1%, are married. Conversely, 21.9% of the teacher respondents identified as single. This distribution underscores that a significant portion of the participants are in committed partnerships or marriages, while a notable proportion remains unmarried. The diverse marital statuses represented in the study contribute to a holistic understanding of the factors influencing the attitudes of teachers towards digital competence and virtual classroom management during the COVID-19 Era. The inclusion of both married and single teachers' perspectives enhances the comprehensiveness of the research findings, as marital status may potentially play a role in shaping teachers' experiences and perspectives within the educational landscape.

Table 4.2.5 Educational Qualification of Teacher Respondent

	Frequency	Percent
NCE/ B.A.Ed.	239	25.6
B.Ed.	260	27.8
BSc. Ed.	386	41.3
M.Ed./M.Sc.	37	4.0
Ph.D.	13	1.4
Total	935	100.0

Source: Fieldwork, 2023

Educational qualifications of teacher respondent were presented in table 4.2.5 and figure 5 (see Appendix viii). The teacher respondents exhibited a diverse array of educational qualifications, signifying a rich spectrum of academic backgrounds. The distribution revealed that 41.3% of the participants possessed a BSc. Ed. qualification, while 27.8% held a B.Ed. degree. Notably, 25.6% of respondents had NCE/B.A.Ed. qualifications. In contrast, a smaller percentage of teachers, approximately 4.0%, held M.Ed./M.Sc. degrees. The study also included a minority of respondents, constituting 1.4%, who had earned Ph.D. degrees. This wide-ranging representation of educational qualifications underscores the inclusivity of the study, capturing insights from teachers with various levels of academic attainment. This diversity in educational backgrounds enhances the thorough exploration of how digital teachers' competence and virtual classroom management influence secondary school students' attitudes towards learning during the COVID-19 Era.

Table 4.2.6 Teaching Experience of Teacher Respondent

	Frequency	Percent
Less than 10 years	429	45.9
11- 20 years	358	38.3
21- 30 years	139	14.9
Above 30	9	1.0

years		
Total	935	100.0

Source: Fieldwork, 2023

Table 4. 2.6 and figure 6(see Appendix ix) presents the teaching experience distribution among the teacher respondents and provides insight into the varying levels of experience within the profession. Among the surveyed teachers, 45.9% reported having less than 10 years of teaching experience, while 38.3% indicated they had 11 to 20 years of experience. Additionally, 14.9% of respondents had been teaching for 21 to 30 years, and a smaller proportion, 1.0%, had accumulated over 30 years of teaching experience. This distribution reflects a range of career stages among the participants. The majority of respondents with fewer than 10 years of experience could bring fresh perspectives and insights, while those with longer experience periods may offer a seasoned viewpoint. The inclusion of teachers with varying levels of experience enriches the study's exploration of the influence of digital teachers' competence and virtual classroom management on students' attitudes towards learning during the COVID-19 Era.

Table 4.2.7 Subject Taught by Teacher Respondents

		Frequency	Percent
Valid	English Language	128	13.7
	Mathematics	152	16.3
	Otherssubjects	655	70.1
	Total	935	100.0

Source: Fieldwork, 2023

Table 4.2.7and figure 10 (see Appendix x) presents subjects taught by teacher respondents. The subjects taught by the teacher respondents offer a glimpse into the diverse academic specialties represented in the study. Among the surveyed teachers, 16.3% reported teaching Mathematics, and 13.7% taught English Language. Notably, the majority, constituting 70.1%, indicated that they taught subjects falling under the "Others" category. This distribution underscores the broad

range of subjects covered by the participants, which likely encompasses various disciplines such as sciences, arts, social sciences, and more. The prevalence of teachers teaching diverse subjects contributes to a well-rounded understanding of the study's focus on the influence of digital teachers' competence and virtual classroom management on secondary school students' attitudes towards learning during the COVID-19 Era. The inclusion of teachers from various subject areas ensures that the findings are applicable across a wide spectrum of academic disciplines.

4.2.7b Others Subjects taught by Respondents

		Frequency	Percent
Valid	Financial Accounting	21	3.2
	Agricultural Science	34	5.2
	Commerce	35	5.4
	Biology	56	8.6
	Yoruba Language	22	3.4
	Catering Craft	1	0.2
	Chemistry	39	6.0
	Christian Religious Studies	18	2.7
	Civic Education	113	17.3
	Physics	27	4.1
	Commerce	33	5.0
	Technical Drawing	4	0.6
	Creative Arts	6	0.9
	Data Processing	11	1.7
	Economics	71	10.8
	Marketing	14	2.1
	Physical & Health Education	8	1.2

Food & Nutrition	9	1.4
French Language	8	1.2
Further Mathematics	4	0.6
Geography	32	4.2
Government	40	6.1
History	18	2.7
Home Management	5	0.8
Igbo Language	5	0.8
Islamic Religious Studies	8	1.2
Literature in English	14	2.2
Total	655	100.0

Source: Fieldwork, 2023

The results presented in Table 4.2.7b and figure 8(see Appendix xi) provide a comprehensive overview of the diverse subjects being taught by teacher respondents other than the core subjects. This table highlights the teachers' extensive expertise and their commitment to imparting a well-rounded education to their students. Here's a closer look at the key insights from the table: The frequency distribution demonstrates that a wide range of subjects is being taught by the teacher respondents. These subjects cover a broad spectrum of academic disciplines, showcasing the teachers' dedication to providing students with a diverse and enriching educational experience. Subjects such as "Biology" (8.6%) and "Physics" (4.1%) hold considerable percentages, indicating the teachers' role in fostering scientific understanding and knowledge. Given the ongoing global health challenges and advancements in scientific research, these subjects play a pivotal role in shaping students' awareness and analytical skills. Subjects like "Civic Education" (17.2%) and "Government" (6.1%) Civic Education as a compulsory subject, highlight the

teachers' efforts in nurturing civic responsibility and fostering an understanding of governance and societal dynamics. As students become active participants in their communities, these subjects contribute to their ability to engage thoughtfully in civic matters. The presence of languages like "Yoruba Language" (3.4%), "French Language" (1.2%), and "Igbo Language" (0.8%) underscores the teachers' role in preserving and promoting linguistic and cultural heritage. This diverse linguistic offering helps students appreciate their own culture and engage with others on a global scale.

Furthermore, subjects like "Financial Accounting" (3.2%), "Marketing" (2.1%), and "Economics" (10.8%) reflect the teachers' commitment to equipping students with practical skills relevant to economic and financial contexts. These subjects are critical in preparing students for careers in business and commerce. The inclusion of interdisciplinary subjects such as "Economics, History & Commerce" (5.4%) suggests teachers' innovative approach in integrating various fields of study. This approach can enhance students' critical thinking and provide holistic insights into complex topics.

Overall, the distribution of subjects in table 4.8 demonstrates the teacher respondents' dedication to providing a holistic and well-rounded education to their students. This diversity aligns with the study's focus on exploring the influence of digital teachers' competence and virtual classroom management on students' attitudes toward learning during the COVID-19 Era. The teachers' proficiency across this wide range of subjects underscores the relevance and applicability of the study's findings across a broad spectrum of educational disciplines, contributing to a comprehensive understanding of the educational landscape during challenging times.

Table 4.2.8 School Type of Teacher Respondents

Frequency	Percent
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Public	295	31.6
Private	640	68.4
Total	935	100.0

Source: Fieldwork, 2023

Table 4.2.8 and Figure 9 (see Appendix xii) presents an insightful breakdown of the school types to which the teacher respondents are affiliated. Through the provided frequencies and percentages, we gain a clear understanding of how teachers are distributed across public and private educational institutions in the study area, shedding light on the educational landscape's dynamics. The analysis of these results unveils the following key insights: A notable proportion of teacher respondents, accounting for 31.6%, are associated with public schools. This presence in public education signifies a diverse range of teachers who contribute to the development of students within the government-funded educational framework. These teachers play a pivotal role in providing quality education to students from various socio-economic backgrounds, fostering inclusivity and accessible learning opportunities.

On the other hand, the majority of respondents, comprising 68.4%, are linked to private schools. This significant percentage underscores the prominence of private educational institutions in the educational ecosystem in Lagos state. Private schools often offer specialized curricula, smaller class sizes, and distinctive teaching approaches that cater to specific student needs. The higher representation of private school teachers could indicate a preference for these institutions, possibly due to their unique teaching methodologies, enhanced resources, or targeted student populations. However, this distribution of teacher respondents across both public and private school types emphasizes the multifaceted nature of the educational sector within Lagos State. Public schools contribute significantly by ensuring accessible education for a diverse student base, while private schools enrich the educational landscape by offering tailored learning experiences that align with their unique approaches.

Furthermore, this distribution adds depth and nuance to the study's exploration of the influence of digital teachers' competence and virtual classroom management on students' attitudes toward learning during the COVID-19 Era. The contrasting contexts of public and private schools introduce distinct challenges and opportunities in implementing digital teaching strategies. The study's findings are expected to benefit from an analysis that considers how these school type differences may shape students' attitudes toward learning, providing a more comprehensive understanding of the evolving educational environment.

Table 4.2.9 Platforms used by Teachers for Virtual Teaching During Lockdown

S/ N	Items	School Type							
		Public				Private			
		At all times	Sometimes	Rarely	Not at all	At all times	Sometimes	Rarely	Not at all
		Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)
1	Radio	195(66.1)	59 (20)	18(6.1)	23(7.8)	413(64.5)	118(18.4)	81 (12.7)	28 (4.4)
2	Television	124(42.0)	112(38.0)	13(4.4)	46(15.6)	256(40.0)	206(32.2)	102(15.9)	76(11.9)
3	Goggle Meet	121(41.0)	114(38.6)	44(14.9)	16(5.4)	245(38.3)	209(32.7)	76(11.9)	110(17.2)
4	Telegram	176(59.7)	65(22.0)	30(10.2)	24(8.1)	296(46.3)	202(31.6)	70(10.9)	72(11.3)
5	Zoom	162(54.9)	116(39.3)	14(4.7)	3(1.0)	370(57.8)	186(29.1)	40(6.3)	44 (6.9)
6	WhatsApp	253(85.8)	33(11.2)	6(2.0)	3 (1.0)	548(85.6)	73(11.4)	14(2.2)	5(0.8)

Source: Fieldwork, 2023

Table 4.2.9 provides an insightful breakdown of the platforms employed by teachers for conducting virtual classes during the lockdown, categorized according to their school types (public and private). The table reveals the frequency of platform usage, segmented into different levels of engagement, ranging from "At all times" to "Not at all." The data is presented as percentages, offering a comprehensive understanding of the preferences and practices of teachers within distinct educational contexts. A comprehensive analysis of these findings unveils the following key insights: Firstly, radio emerged as a noteworthy platform for virtual classes during the lockdown. Impressively, 66.1% of public- school teachers and 64.5% of private school

teachers employed radio "At all times." This substantial reliance on radio underscores its vital role in reaching students across diverse educational settings, irrespective of school type.

Similarly, television proved to be a significant tool for virtual teaching. 42.0% of public-school teachers and 40.0% of private school teachers utilized television "At all times." The visual medium of television allowed teachers to convey complex concepts effectively through audio-visual aids. Moreover, Google Meet emerged as a favoured platform for real-time interactions. 41.0% of public-school teachers and 38.3% of private school teachers employed Google Meet "At all times." This choice suggests a preference for live engagement and synchronous communication with students. Telegraph was also notably utilized, with 59.7% of public-school teachers and 46.3% of private school teachers employing it "At all times." The platform's messaging features likely facilitated seamless communication and resource sharing between teachers and students. Zoom gained traction as a popular virtual classroom solution. 54.9% of public-school teachers and 57.8% of private school teachers used Zoom "At all times." This choice reflects the platform's versatility in hosting interactive teaching sessions and webinars. In terms of instant messaging, WhatsApp stood out as a cornerstone of virtual teaching. An impressive 85.8% of public-school teachers and 85.6% of private school teachers relied on WhatsApp "At all times." The platform's user-friendly interface and widespread usage made it a preferred tool for teacher-student communication.

These compelling findings underscore the adaptability and ingenuity of teachers in utilizing a diverse range of platforms for effective virtual teaching. Across public and private school settings, teachers combined various platforms to ensure seamless communication and student engagement. The data from this table holds paramount significance in understanding the role of technology in maintaining educational continuity during the lockdown. It contributes

substantially to the ongoing study's exploration of how the competence of digital teachers and the management of virtual classrooms influence students' attitudes toward learning in the COVID-19 Era, underscoring the pivotal role of technology in shaping modern educational practices.

Table 4.2.10 Platforms used by Teachers for Virtual Teaching After Lockdown

		School Type							
		Public				Private			
		At all times	Sometimes	Rarely	Not at all	At all times	Sometimes	Rarely	Not at all
S/N	Items	Freq(%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)
1	Radio	53 (18.0)	25 (8.5)	32(10.8)	185(62.7)	149(23.3)	63(9.8)	55 (8.6)	373(58.3)
2	Television	47 (15.9)	14(4.7)	22(7.5)	212(71.9)	142(22.2)	24 (3.8)	52(8.1)	422(65.9)
3	Goggle Meet	48 (16.3)	5 (1.7)	31 (10.5)	211(71.5)	138(21.6)	19 (3.0)	62(9.7)	421(65.8)
4	Telegram	53(18.0)	16 (5.4)	32 (10.8)	194(65.8)	183(28.6)	27 (4.2)	73(11.4)	357(55.8)
5	Zoom	28(9.5)	14 (4.7)	17 (5.8)	23(80.0)	108(16.9)	20 (3.1)	60 (9.4)	452(70.6)
6	WhatsApp	72(24.4)	15 (5.1)	34 (11.5)	174(59.0)	217(33.9)	27 (4.2)	92(14.4)	304(47.5)

Source: Fieldwork, 2023

Table 4.2.10 provides a comprehensive overview of the platforms that teachers employed for virtual classes in the post-lockdown period, categorized by school types (public and private). The table showcases the frequency of platform usage, segmented into different levels of engagement ranging from "At all times" to "Not at all." The data is presented as percentages, offering a clear understanding of the preferences and practices of teachers within specific educational contexts. A thorough examination of the results reveals the following key insights: Radio usage persisted as a relevant platform for virtual teaching even during the lockdown. Interestingly, 18.0% of public-school teachers continued to use radio "At all times," while a substantial 62.7% of private school teachers maintained the same level of reliance. This divergence in usage indicates a notable preference among private school teachers for sustaining communication with their students through radio broadcasts. The significance of television in virtual teaching endured as well.

15.9% of public-school teachers and a striking 71.9% of private school teachers continued to employ television "At all times." This trend underscores the continuing value of visual aids in delivering educational content to students.

Google Meet continued to be a preferred platform for real-time interactions. Among public school teachers, 16.3% utilized Google Meet "At all times," while 71.5% of their private school counterparts exhibited the same level of engagement. This choice reflects a sustained preference for live engagement and immediate communication with students. The role of Telegram in virtual education remained evident, with 18.0% of public-school teachers and 65.8% of private school teachers utilizing it "At all times." Telegram's appeal seems to lie in its ability to facilitate ongoing communication and the exchange of resources between teachers and students. Zoom's popularity as a virtual classroom solution persisted strongly. 9.5% of public-school teachers and a significant 80.0% of private school teachers relied on Zoom "At all times." The widespread usage of Zoom among private school teachers likely reflects its versatile features that cater to various aspects of online teaching. WhatsApp maintained its central role in facilitating communication. A notable 24.4% of public-school teachers and 33.9% of private school teachers continued to rely on WhatsApp "At all times." This consistent preference indicates the enduring value of instant messaging as a means of teacher-student interaction.

In all, the findings underscore the adaptability of teachers in using a diverse range of platforms for sustained virtual teaching. Across both public and private school settings, teachers continued to leverage various tools to ensure effective communication and meaningful student engagement. The insights gleaned from this table provide valuable perspectives on the evolving landscape of education post-lockdown. These insights contribute significantly to the ongoing study's exploration of how the competence of digital teachers and the management of virtual classrooms

influence students' attitudes toward learning during the COVID-19 Era, reaffirming the pivotal role of technology in shaping modern educational practices.

Demographic Information of Student Respondents

Table 4.2.11 Local Government Area of Student Respondents

	Frequency	Percent
Agege	238	15.5
Ikorodu	408	27.2
Lagos Island	195	13.0
Lagos Mainland	206	13.6
Amuwo-Odofin	215	14.4
Ikeja	244	16.3
Total	1495	100.0

Source: Fieldwork, 2023

Table 4.2.11 offers a comprehensive overview of the local government areas (LGAs) from which student respondents actively engaged in the study. This table presents both the frequency and the corresponding percentage distribution of student participants across various LGAs within Lagos State. Analyzing the results provides valuable insights into the geographic representation of students and their involvement in the study: The LGA of Agege is notably represented by 238 student respondents, contributing 15.5% of the total participants. This presence indicates a significant engagement of students from Agege in the study, contributing to the diverse perspectives. Ikorodu emerges as a substantial contributor, with 408 student respondents making up 27.2% of the total. This high representation underlines the active involvement of students from Ikorodu and their willingness to contribute to the research. Lagos Island is also part of the

study's landscape, with 195 student responses representing 13.0% of the total. This showcases the urban representation and the interest of students from this central area of Lagos.

Similarly, Lagos Mainland contributes 204 student responses, accounting for 13.6% of the total. The participation of students from Lagos Mainland enriches the study's dataset and reflects the diversity of the city. Amuwo-Odofin, with 215 student respondents, makes up 14.4% of the total. The involvement of students from this locality brings valuable insights from a distinct area within Lagos. Ikeja stands out with 244 student respondents, constituting 16.3% of the total. This significant participation underscores the engagement of students from the capital city and their contribution to the study. Collectively, the responses from these LGAs amount to 1495 student participants, representing a diverse cross-section of Lagos State. This broad geographic representation enhances the richness of the study's findings, ensuring that the insights gained are reflective of a wide range of perspectives within the state. The distribution of student respondents across these LGAs underscores the study's comprehensive approach and its ability to capture the nuanced attitudes of students toward learning in the context of the COVID-19 Era.

Table 4.2.12 Gender of Student Respondents

	Frequency	Percent
Male	574	38.3
Female	923	61.7
Total	1497	100.0

Source: Fieldwork, 2023

Table 4.2.12 sheds light on the gender distribution of student respondents, presenting both the frequency and percentage breakdown. This table provides valuable insights into the composition of the study's participants in terms of gender: Male students are represented by 574 responses, making up 38.3% of the total student participants. This presence reflects a substantial

engagement of male students in the study and their willingness to contribute their perspectives. On the other hand, female students constitute a significant portion, with 923 responses accounting for 61.7% of the total. This notable representation emphasizes the active involvement of female students in sharing their insights and experiences. Collectively, the responses from both male and female students combine to form a total of 1497 participants. This comprehensive gender distribution contributes to the study's diversity and ensures that the findings are well-rounded, representing the attitudes and viewpoints of both genders. The gender distribution in this study provides a balanced perspective and enables a deeper understanding of the impact of digital teachers' competence and virtual classroom management on students' attitudes towards learning during the COVID-19 Era. The insights gained from both male and female students contribute to a holistic view of the educational landscape during these challenging times.

Table 4.2.13 Age Distribution of Student Respondents

	Frequency	Percent
12-15 years	548	36.6
16- 20 years	949	63.4
Total	1497	100.0

Source: Fieldwork, 2023

Table 4.2.13 provides a comprehensive overview of the age distribution of student respondents, presenting both the frequency and percentage distribution. This table offers valuable insights into the age composition of the students' participants in the study: A significant number of students, 548 in total, fall within the age range of 12-15 years, constituting 36.6% of the total student participants. This indicates substantial engagement of students in this age group, representing a considerable portion of the study's participants. The age group of 16-20 years encompasses a larger segment, with 949 student responses making up 63.4% of the total. This substantial

representation underscores the active involvement of older students in contributing their perspectives and experiences to the study. In total, the combined responses from both age groups amount to 1497 participants. This comprehensive age distribution ensures that the findings of the study capture the attitudes and viewpoints of students from various stages of their secondary education. The age distribution in this study enables a nuanced understanding of how students of different age groups perceive the influence of digital teachers' competence and virtual classroom management on their attitudes towards learning during the COVID-19 Era. The insights from both younger and older students contribute to a comprehensive analysis of the impact of these factors on students' learning experiences.

Table 4.2.14 School Type of Student Respondents

	Frequency	Percent
Public	928	62.0
Private	569	38.0
Total	1497	100.0

Source: Fieldwork, 2023

Table 4.2.14 offers a comprehensive view of the school type distribution among student respondents, presenting both the frequency and percentage breakdown. This table provides valuable insights into the composition of the participants based on their school types: A substantial number of students, 928 in total, are enrolled in public schools, making up 62.0% of the total student participants. This notable representation highlights the active engagement of students from public schools and their contribution to the study's insights. On the other hand, students from private schools constitute a significant portion, with 569 responses accounting for 38.0% of the total. This presence underscores the engagement of students from private educational institutions, sharing their perspectives and experiences. Collectively, the responses from both public and private school students combine to form a total of 1495 participants. This

diverse distribution based on school type ensures that the study captures the attitudes and viewpoints of students from different educational background.

The school type distribution in this study enriches the analysis, allowing for a more comprehensive exploration of the impact of digital teachers' competence and virtual classroom management on students' attitudes towards learning during the COVID-19 Era. The insights gained from both public and private school students contribute to a well-rounded understanding of the educational landscape during these challenging times.

Table 4.2.15 Platforms used by Students for Virtual Classes during Lockdown

S/ N	Items	School Type							
		Public				Private			
		Often Freq (%)	Seldom Freq (%)	Rarely Freq (%)	Never Freq (%)	Often Freq (%)	Seldom Freq (%)	Rarely Freq(%))	Never Freq(%))
1	Television	336(36.2)	338(36.4)	121(13.0)	133(14.3)	237(41.7)	201(35.3)	7(13.5)	54(9.5)
2	Radio	264(28.4)	346(37.3)	153(16.5)	165(17.8)	253(44.5)	149(26.2)	(17.0)	70(12.3)
3	WhatsApp	698(75.2)	151(16.3)	79(8.5)	0(0)	475(83.5)	63(11.1)	31(5.4)	0(0.0)
4	Telegram	439(47.3)	256(27.6)	134(14.4)	99(10.7)	224(39.4)	237(41.7)	69(12.1)	39(6.9)
5	Zoom	372(40.1)	260(28.0)	190(20.5)	106(11.4)	226(39.7)	215(37.8)	86(15.1)	42(7.4)
6	Goggle meet	415(44.7)	333(35.9)	111(12.0)	69(7.4)	22(39.9)	231(40.6)	62(10.9)	49(8.6)

Source: Fieldwork, 2023

Table 4.2.15 provides an insightful perspective on the platforms used by student respondents for virtual classes during the lockdown period, categorized by school type. The table's data reveals valuable insights into the preferences and usage patterns of students when it comes to virtual learning platforms: Among public school students, Television emerges as a prominent choice for virtual classes, with 336 responses indicating that it is used often (36.2%), followed closely by 338 responses (36.4%) for its use sometimes. This data highlights the significant role television

played in facilitating remote learning for students in public schools during the lockdown. Similarly, Radio also serves as a substantial platform for public school students, with 264 responses (28.4%) indicating its frequent usage and 346 responses (37.3%) indicating occasional use. This data showcases the importance of radio as a medium for delivering educational content to public school students. For public school students, WhatsApp stands out as a dominant platform for virtual classes, with 698 responses (75.2%) indicating its frequent usage. This suggests that many public- school students relied heavily on WhatsApp for communication and educational content during the lockdown.

On the other hand, among private school students, Television and WhatsApp also maintain their significance. Television is often used by 237 students (41.7%), while WhatsApp remains a strong contender with 475 responses (83.5%) indicating its frequent use. These platforms seem to be integral to virtual learning experiences for students in private schools as well. It's worth noting that platforms like Telegram, Zoom, and Google Meet also see varying degrees of usage among both public and private school students, with their frequencies indicating their roles in facilitating virtual classes to different extents.

Overall, table 4.15 presents a comprehensive view of how students from different school types adapted to virtual learning during the lockdown period. The variations in platform usage based on school type shed light on the strategies employed by students in their educational journey during challenging times.

Table 4.2.16 Platforms used by Students for Virtual Classes After Lockdown

S/ N	Items	School Type							
		Public				Private			
		Often	Seldom	Rarely	Never	Often	Seldom	Rarely	Never
		Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq(%)

1	Television	219(23.6)	305(32.9)	98(10.6)	306(33.0)	182(32.0)	141(24.8)	64(11.2)	182(32.0)
2	Radio	130(14.0)	148(15.9)	274(29.5)	376(40.5)	81(14.2)	117(20.6)	201(35.3)	170(29.9)
3	WhatsApp	532(57.3)	89 (9.6)	106(11.4)	201(21.7)	349(61.3)	40 (7.0)	86 (15.1)	94 (16.5)
4	Telegram	147(15.8)	81 (8.7)	217(23.4)	483(52.0)	75 (13.2)	25 (4.4)	214(37.6)	255(44.8)
5	Zoom	188(20.3)	57 (6.1)	233(25.1)	450(48.5)	93 (16.3)	21 (3.7)	200(35.1)	255(44.8)
6	Goggle meet	12(13.3)	45 (4.8)	289(31.1)	471(50.8)	72 (12.7)	19 (3.3)	210(36.9)	268(47.1)

Source: Fieldwork, 2023

Table 4.2.16 delves into the platforms that student respondents used for virtual classes during the lockdown period, segmented by school type. The data from this table provides valuable insights into how students' platform preferences evolved as the lockdown restrictions eased: Television continues to be a significant platform for both public and private school students. Among public school students, 219 respondents (23.6%) indicated that they often used television for virtual classes, while 305 responses (32.9%) indicated occasional use. Private school students also maintained their reliance on television, with 182 responses (32.0%) indicating often usage and 141 responses (24.8%) indicating seldom usage. This consistency underscores the continued role of television in supporting remote learning post-lockdown. Radio, although showing a decrease in usage compared to the lockdown period, still holds importance. Public school students' responses indicate a shift in usage, with 130 responses (14.0%) for often usage and 148 responses (15.9%) for seldom usage. On the other hand, private school students' responses reveal a reduced reliance, with 81 responses (14.2%) for often usage and 117 responses (20.6%) for seldom usage. WhatsApp remains a dominant platform for students across both school types. For public school students, 532 responses (57.3%) indicate frequent usage, while private school students continue to rely on it with 349 responses (61.3%). These figures suggest that WhatsApp retained its significance as a communication and learning tool beyond the lockdown. Telegram,

Zoom, and Google Meet also maintained varying degrees of usage post-lockdown. Among private school students, there's a consistent trend where Telegram is used by 75 respondents (13.2%) often, 25 respondents (4.4%) sometimes, and 214 respondents (37.6%) rarely. Zoom and Google Meet also showcase consistent patterns of usage across both school types, indicating their ongoing relevance. In all, table 4.17 highlights the evolving platform preferences of student respondents as they navigated virtual learning during the lockdown period. The data underscores the persistent importance of certain platforms while revealing shifts in others, providing valuable insights into the changing dynamics of remote education in a post-lockdown scenario.

4.3 Analysis of Respondents' Opinion on Research Questions

Research Question One: What is the attitudinal level of the secondary school students towards learning in COVID-19 Era in Lagos State?

Table 4.3.1 Level of Secondary School Student's Attitude Towards Learning (During Lockdown) in the COVID -19 Era in Lagos State

S/N	Items	At all times	Sometimes	Rarely	Not at all	Mean	SD
		Freq (%)	Freq (%)	Freq (%)	Freq (%)		
1	I am confident about my ability to learn new concepts during lockdown	1201(80.2)	274(18.3)	2(.1)	20(1.3)	3.77	.508
2	I dedicates time and efforts to studying and completing assignments during lockdown	856(57.2)	560(37.4)	80(5.3)	1(.1)	3.52	.601

3	I get familiar with tools and its rules during lockdown	626(41.8)	703(47.0)	142(9.5)	26(1.7)	3.29	.707
4	I adjust to online learning during lockdown	595(39.7)	639(42.7)	163(10.9)	100(6.7)	3.15	.866
5	I create study plan and stick to it	599(40.0)	658(44.0)	200(13.4)	40(2.7)	3.21	.772
6	I avoid distractions such as social media or other non-academic issues	519(34.7)	592(39.5)	281(18.8)	105(7.0)	3.02	.903
7	I set goals for academic performance and work towards achieving them	1203(80.4)	237(15.8)	44(2.9)	13(.9)	3.76	.543
8	I persist in the face of difficulties or set back in your classes rather than giving up	914(61.1)	461(30.8)	88(5.9)	34 (2.3)	3.51	.710
9	I take time to fully understand new concept	1053(70.3)	419(28.0)	17(1.1)	8(.5)	3.68	.522
10	I remain focused and engaged during virtual classroom teaching	1008(67.3)	439(29.3)	38(2.5)	12(.8)	3.63	.576
11	I maintain a positive attitude and avoid becoming frustrated when faced with challenges in virtual classroom	798(53.3)	567(37.9)	119(7.9)	13(.9)	3.44	.676

12	I refrain from rushing through my assignments	598(39.9)	777(51.9)	94(6.3)	28(1.9)	3.30	.669
Weighted Mean						3.44	

Source: Fieldwork, 2023

Decision Rule: 0 – 1.49= Very Low, 1.50 - 2.49= Low, 2.5 – 3.49 = High, 3.50 – 4.0 = Very High

Table 4.3.1 presents the level of secondary school students' attitude towards learning during the COVID-19 Era in Lagos State across various dimensions, providing insights into their perceptions and behaviours.

Confidence in Learning New Concepts: A significant proportion of students (80.2%) indicated being confident in their ability to learn new concepts during the lockdown. A smaller percentage (18.3%) reported feeling confident sometimes, while very few (0.1%) responded rarely. The mean score for this item was **3.77** with a standard deviation of 0. 508.

Time Dedication to Studying and Assignments: The majority (57.2%) reported dedicating time and effort to studying and assignments at all times, while 37.4% indicated doing so sometimes. A minor percentage (5.3%) reported rarely dedicating time, and a negligible portion (0.1%) responded not at all. The mean score for this item was **3.52** with a standard deviation of 0. 601.

Familiarity with Tools and Rules: Students' familiarity with tools and their rules during the lockdown was reported by 41.8% at all times and 47.0% sometimes. A smaller proportion (9.5%) indicated rare familiarity, while only 1.7% responded not at all. The mean score for this item was **3.29** with a standard deviation of 0. 707.

Adjustment to Online Learning: In terms of adjusting to online learning during the lockdown, 39.7% reported doing so at all times, while 42.7% indicated sometimes. A minority (10.9%) reported rare adjustment, and 6.7% responded not at all. The mean score for this item was **3.15** with a standard deviation of 0.866.

Creation and Adherence to Study Plans: A significant proportion (40.0%) created study plans and stuck to them at all times, while 44.0% did so sometimes. A smaller percentage (13.4%) rarely adhered to their study plans, and 2.7% did not do so at all. The mean score for this item was 3.21 with a standard deviation of 0.772. Avoidance of Distractions: The majority (34.7%) avoided distractions like social media or non-academic issues at all times, while 39.5% did so sometimes. A notable proportion (18.8%) reported rarely avoiding distractions, and 7.0% indicated not doing so at all. The mean score for this item was 3.02 with a standard deviation of 0.903. Goal Setting and Achievement: Students' dedication to goal setting and working towards achieving those goals was reported by 80.4% at all times, 15.8% sometimes, and 2.9% rarely. Only 0.9% responded not doing so at all. The mean score for this item was 3.76 with a standard deviation of 0.543. Persistence in the Face of Difficulties: In the face of challenges, 61.1% persisted in their classes rather than giving up at all times, 30.8% did so sometimes, and 5.9% rarely. A minor percentage (2.3%) indicated not persisting. The mean score for this item was 3.51 with a standard deviation of 0.710.

Understanding New Concepts: A majority (70.3%) reported taking time to fully understand new concepts at all times, while 28.0% did so sometimes. A minimal percentage (1.1%) rarely did so, and 0.5% responded not doing so at all. The mean score for this item was 3.68 with a standard deviation of 0.522. Focused Engagement during Virtual Classroom: In terms of remaining focused during virtual classroom teaching, 67.3% indicated always being engaged, 29.3% sometimes, and 2.5% rarely. A negligible proportion (0.8%) responded not staying engaged. The mean score for this item was 3.63 with a standard deviation of 0.576. Positive Attitude and Handling Challenges: Students' maintenance of a positive attitude and avoidance of frustration during challenges was reported by 53.3% at all times, 37.9% sometimes, and 7.9% rarely. A

small percentage (0.9%) indicated not doing so. The mean score for this item was 3.44 with a standard deviation of 0.676. Avoidance of Rushing Through Assignments: Among students, 39.9% avoided rushing through assignments at all times, 51.9% did so sometimes, and 6.3% rarely. A minor percentage (1.9%) indicated not avoiding rushing. The mean score for this item was 3.30 with a standard deviation of 0.669.

The overall weighted mean across all dimensions was calculated as 3.44, indicating a generally positive attitude towards learning during the COVID-19 Era among secondary school students in Lagos State. In all Table the result presents a comprehensive assessment of students' attitudes and behaviours, revealing a balanced perspective on their approach to learning in the challenging context of the pandemic.

From the results presented in table 4.3.1, several key inferences can be drawn regarding the attitudes of secondary school students towards learning during the COVID-19 Era in Lagos State. For instance, the high percentage of students (80.2%) expressing confidence in their ability to learn new concepts during the lockdown highlights their resilience and adaptability. This suggests that students have not only embraced the challenges of virtual learning but also believe in their capacity to grasp new knowledge in changing circumstances. The significant proportion of students (57.2%) dedicating time and effort to studying and completing assignments during the lockdown indicates their commitment to maintaining their academic progress. This dedication reflects a strong sense of responsibility towards their education even in the face of disruptions caused by COVID-19 lockdown. The students' familiarity (41.8%) with tools and rules for online learning underscores their capacity to navigate virtual platforms effectively. This suggests that many students have successfully adapted to the digital learning environment, which is crucial for their continued academic success. The inclination of students (40.0%) to create

study plans and stick to them showcases a level of self-discipline, while the majority (61.1%) choosing to persist in the face of difficulties highlights their determination to overcome challenges. These traits are indicative of a growth mindset and a proactive approach to learning. While a significant portion (34.7%) avoids distractions such as social media or non-academic issues, the presence of distractions for some (18.8%) signifies a need for improved focus during virtual learning. This indicates an opportunity for students to develop better strategies for maintaining concentration. The majority of students (53.3%) maintain a positive attitude and avoid becoming frustrated when faced with challenges in the virtual classroom. This resilience showcases their ability to adapt to new circumstances and overcome obstacles with an optimistic outlook. A substantial percentage of students (70.3%) take time to fully understand new concepts, highlighting their commitment to deep and meaningful learning. This focus on comprehension rather than rushing through material indicates a genuine interest in grasping subject matter thoroughly. The overall weighted mean of 3.44 reflects a generally positive attitude of secondary school students towards learning during the COVID-19 Era. This suggests that, despite the challenges and adjustments required by virtual learning, students in Lagos State have displayed commendable dedication, adaptability, and resilience in their educational pursuits.

In all, the results indicate that secondary school students in Lagos State have demonstrated commendable adaptability, determination, and dedication to learning in the face of the COVID-19 pandemic. While there are areas for improvement, the overall positive attitude and willingness to embrace new learning methods highlight their capacity to navigate challenging circumstances and continue their education effectively.

Table 4.3.2 Level of Secondary School Student's Attitude towards Learning (After Lockdown) in the COVID-19 Era Lagos State

S/N	Items	At all times	Sometimes	Rarely	Not at all	Mean	SD
		Freq (%)	Freq (%)	Freq (%)	Freq (%)		
1	I am confident about my ability to learn new concepts after lockdown	1270(84.8)	172(11.5)	18(1.2)	37(2.5)	3.79	.583
2	I dedicates time and efforts to studying and completing assignments after lockdown	971(64.9)	468(31.3)	37(2.5)	21(1.4)	3.60	.612
3	I get familiar with tools and its rules after lockdown	737(49.2)	630(42.1)	75(5.0)	55(3.7)	3.37	.744
4	I adjust to online learning after lockdown	589(39.3)	591(39.5)	195(13.0)	122(8.1)	3.10	.917
5	I create study plan and stick to it after lockdown	625(41.8)	688(46.0)	114(7.6)	70(4.7)	3.25	.787
6	I avoid distractions such as social media or other non-academic issues after lockdown	546(36.5)	655(43.8)	208(13.9)	88(5.9)	3.11	.853
7	I set goals for academic performance and work towards achieving them after lockdown	1146(76.6)	244(16.3)	78(5.2)	29(1.9)	3.67	.663

8	I persist in the face of difficulties or set back in your classes rather than giving up after lockdown	994(66.4)	385(25.7)	78(5.2)	40(2.7)	3.56	.715
9	I take time to fully understand new concept after lockdown	1001(66.9)	391(26.1)	61(4.1)	44(2.9)	3.57	.710
10	I remain focused and engaged during virtual classroom teaching after lockdown	983(65.7)	355(23.7)	91(6.1)	68(4.5)	3.51	.803
11	I maintain a positive attitude and avoid becoming frustrated when faced with challenges in virtual classroom after lockdown	893(59.7)	490(32.7)	77(5.1)	37(2.5)	3.50	.708
12	I refrain from rushing through my assignments after lockdown	681(45.5)	611(40.8)	133(8.9)	72(4.8)	3.27	.815
Weighted Mean						3.44	

Source: Fieldwork, 2023

Decision Rule: 0 – 1.49= Very Low, 1.50 - 2.49= Low, 2.5 – 3.49 = High, 3.50 – 4.0 = Very High

Table 4.3.2 presents the level of secondary school students' attitude towards learning in Lagos State after the COVID-19 Era, offering insights into their outlook across various dimensions:

Confidence in Learning New Concepts: A significant portion of students (84.8%) indicated strong confidence in their ability to learn new concepts after the lockdown. A smaller percentage (11.5%) reported feeling confident sometimes, while a mere 1.2% responded rarely. However, 2.5% of the students did not express confidence. The mean score for this item was 3.79 with a

standard deviation of 0.583. Time Dedication to Studying and Assignments: Among the students, 64.9% reported dedicating time and effort to studying and completing assignments at all times, while 31.3% indicated doing so sometimes. A minor percentage (2.5%) reported rarely dedicating time, and 1.4% responded not at all. The mean score for this item was 3.60 with a standard deviation of 0.612. Familiarity with Tools and Rules: The students' familiarity with tools and their rules after the lockdown was reported by 49.2% at all times and 42.1% sometimes. A smaller proportion (5.0%) indicated rare familiarity, while 3.7% responded not at all. The mean score for this item was 3.37 with a standard deviation of 0.744. Adjustment to Online Learning: Concerning adjusting to online learning after the lockdown, 39.3% reported doing so at all times, while 39.5% indicated sometimes. A notable minority (13.0%) reported rare adjustment, and 8.1% responded not at all. The mean score for this item was 3.10 with a standard deviation of 0.917.

Creation and Adherence to Study Plans: A significant proportion (41.8%) created study plans and adhered to them at all times, while 46.0% did so sometimes. A minor percentage (7.6%) rarely adhered to their study plans, and 4.7% did not adhere at all. The mean score for this item was 3.25 with a standard deviation of 0.787. Avoidance of Distractions: The majority (36.5%) avoided distractions like social media or other non-academic issues at all times, while 43.8% did so sometimes. A notable proportion (13.9%) rarely avoided distractions, and 5.9% indicated not avoiding them at all. The mean score for this item was 3.11 with a standard deviation of 0.853. Goal Setting and Achievement: Students' dedication to goal setting and working towards achieving those goals was reported by 76.6% at all times, 16.3% sometimes, and 5.2% rarely. Only 1.9% responded not doing so at all. The mean score for this item was 3.67 with a standard deviation of 0.663. Persistence in the Face of Difficulties: When faced with challenges, 66.4%

persisted in their classes rather than giving up at all times, 25.7% did so sometimes, and 5.2% rarely. A minor percentage (2.7%) indicated not persisting. The mean score for this item was 3.56 with a standard deviation of 0.715.

Understanding New Concepts: A majority (66.9%) reported taking time to fully understand new concepts at all times, while 26.1% did so sometimes. A minimal percentage (4.1%) rarely did so, and 2.9% responded not doing so at all. The mean score for this item was 3.57 with a standard deviation of 0.710.

Focused Engagement during Virtual Classroom

In terms of remaining focused during virtual classroom teaching after the lockdown, 65.7% indicated always being engaged, 23.7% sometimes, and 6.1% rarely. A moderate proportion (4.5%) responded not staying engaged. The mean score for this item was 3.51 with a standard deviation of 0.803.

Positive Attitude and Handling Challenges Students' maintenance of a positive attitude and avoidance of frustration during challenges was reported by 59.7% at all times, 32.7% sometimes, and 5.1% rarely. A minor percentage (2.5%) indicated not doing so. The mean score for this item was 3.50 with a standard deviation of 0.708.

Avoidance of Rushing Through Assignments Among students, 45.5% avoided rushing through assignments at all times, 40.8% did so sometimes, and 8.9% rarely. A notable percentage (4.8%) indicated not avoiding rushing. The mean score for this item was 3.27 with a standard deviation of 0.815.

Overall Weighted Mean: The overall weighted mean across all dimensions was calculated as 3.44, reflecting a balanced attitude towards learning among secondary school students in Lagos State after the COVID-19 Era. The assessment provides valuable insights into students' behaviours and perceptions in the challenging context of pandemic-induced changes.

The findings presented in Table 4.19 provide valuable insights into the attitudes of secondary school students towards learning in Lagos State after the COVID-19 Era. These attitudes have been examined across various dimensions, including Confidence, Self-Discipline, Patience, Focused Engagement, Positive Attitude, and Avoidance of Rushing. The implications of these findings are as follows:

The majority of students expressed strong confidence in their ability to learn new concepts after the lockdown. This suggests that the students have a positive outlook and belief in their learning capabilities. This confidence is crucial for effective learning and can contribute to better academic performance. The substantial proportion of students who reported dedicating time and effort to studying and assignments is encouraging. It indicates a commitment to their academic responsibilities, which can lead to better understanding of the subjects and improved overall performance. The reported familiarity with tools and rules after the lockdown is moderately positive. This might indicate that students have adapted to new tools and methods introduced during the pandemic, although there is room for improvement. Increased familiarity can contribute to more effective online learning experiences. The findings related to adjusting to online learning suggest a mixed response. While a significant portion of students reported adjusting to online learning, there is still a considerable minority that faced challenges with this transition. This highlights the need for continued support and resources for students to succeed in the digital learning environment. The findings related to self-discipline, such as creating and adhering to study plans and avoiding distractions, suggest a balanced attitude. A considerable proportion of students reported positive habits in these areas, which can positively impact their academic success. The students' dedication to goal setting and persistence in the face of difficulties is promising. This indicates a proactive approach to their education and a willingness

to overcome challenges. These qualities are important for long-term success in academics and beyond. The reported patience in understanding new concepts and maintaining a positive attitude during challenges is encouraging. These attributes contribute to a constructive learning environment and the ability to overcome obstacles with a growth mindset. The engagement levels during virtual classroom teaching indicate that a majority of students are actively participating and remaining focused. This is crucial for effective learning in an online setting. The findings related to avoiding rushing through assignments highlight a balanced approach. Rushing through assignments can lead to superficial understanding, so it's positive that a significant portion of students reported avoiding this behaviour.

The calculated overall weighted mean of 3.44 indicates a balanced attitude towards learning among secondary school students in Lagos State after the COVID-19 Era. This suggests that, on the whole, students are displaying positive behaviours and perceptions towards their education despite the challenges posed by the pandemic.

In all, the findings reflect a generally positive outlook among secondary school students in Lagos State towards learning after the COVID-19 Era. However, there are areas that might benefit from further improvement, such as familiarity with online tools and addressing challenges associated with online learning. Teachers and policymakers can use these insights to tailor interventions and support strategies that enhance students' learning experiences and outcomes in the post-pandemic context

Comprehensive Comparison of Secondary School Students' Attitude towards Learning in the COVID-19 Era

To compare the students' attitudes towards learning before and after the COVID-19 Era in Lagos State, the researcher analysed the data presented in Tables 4.3.1 and 4.3.2. The data is organized

into different dimensions such as "Readiness," "Self-Discipline," and "Patience. The researcher focused on key patterns and changes in these dimensions:

Confidence in Learning New Concepts: After the COVID-19 Era, there is an increase in students' strong confidence in their ability to learn new concepts (84.8% after vs. 80.2% during). This suggests a boost in students' self-assurance in their learning capabilities. **Time Dedication to Studying and Assignments:** More students reported dedicating time and effort to studying and assignments at all times after the COVID-19 Era (64.9% after vs. 57.2% during). This indicates a higher commitment to academic tasks.

Creation and Adherence to Study Plans: There is a slight increase in students creating study plans and adhering to them at all times after the COVID-19 Era (41.8% after vs. 40.0% during). This suggests a small improvement in study planning habits. **Avoidance of Distractions:** The percentage of students avoiding distractions at all times decreased after the COVID-19 Era (36.5% after vs. 34.7% during). This might imply that students found it slightly more challenging to avoid distractions post-pandemic. **Goal Setting and Achievement:** Students' dedication to goal setting and working towards those goals remained relatively stable after the COVID-19 Era (76.6% after vs. 80.4% during). **Persistence in the Face of Difficulties:** There is a minor decrease in students' persistence in classes after the COVID-19 Era (66.4% after vs. 61.1% during). This might indicate a slight decrease in resilience.

Understanding New Concepts: The percentage of students taking time to understand new concepts at all times remained consistent after the COVID-19 Era (66.9% after vs. 70.3% during). **Focused Engagement during Virtual Classroom:** The levels of remaining focused during virtual classroom teaching remained similar after the COVID-19 Era (65.7% after vs. 67.3% during). **Positive Attitude and Handling Challenges:** There is a slight decrease in students

maintaining a positive attitude during challenges after the COVID-19 Era (59.7% after vs. 53.3% during). This indicates a minor decline in handling challenges optimistically. Avoidance of Rushing Through Assignments: The proportion of students avoiding rushing through assignments at all times decreased after the COVID-19 Era (45.5% after vs. 39.9% during).

The overall weighted mean remained consistent before (3.44) and after (3.44) the COVID-19 Era, indicating that the students' attitude towards learning remained balanced over time. In all, while there are some variations in specific dimensions, the overall attitude towards learning remained fairly stable, with some areas showing slight improvements or decreases. It's important to note that the changes are relatively subtle, suggesting that the influence of the COVID-19 Era might not have dramatically altered students' attitudes towards learning in Lagos State.

The comparison of students' attitudes towards learning before and after the COVID-19 Era in Lagos State provides several implications:

Increased Confidence: The increase in students' confidence in learning new concepts after the COVID-19 Era suggests that the experience of online and remote learning during the pandemic might have contributed to enhancing their self-belief and adaptability.

Shift in Time Dedication: The higher percentage of students dedicating time to studying and assignments after the COVID-19 Era indicates a potential shift in study habits. Students might have recognized the importance of consistent effort in a changed learning environment.

Challenges with Distraction: The decrease in students' avoidance of distractions after the COVID-19 Era implies that students might have found it more challenging to stay focused on their studies, possibly due to the increased use of technology and online platforms.

Resilience and Persistence: The slight decrease in persistence in the face of difficulties after the COVID-19 Era suggests that some students might have found it harder to stay motivated and overcome challenges in a post-pandemic learning context.

Goal Setting Consistency: The consistency in students' dedication to goal setting and achievement before and after the COVID-19 Era indicates that the importance of setting goals remained relatively stable regardless of the learning environment.

Steady Learning Engagement: The consistent levels of focused engagement during virtual classroom teaching suggest that students were able to maintain their engagement levels despite the transition from online to in-person learning.

Handling Challenges Optimistically: While there's a slight decrease in maintaining a positive attitude during challenges after the COVID-19 Era, a majority of students still exhibit this trait. This could indicate that students have adapted well to challenges, albeit with a minor decline in overall positivity.

Rushing Through Assignments: The decrease in the avoidance of rushing through assignments after the COVID-19 Era suggests that some students might have faced challenges managing their time effectively or maintaining a balanced pace of work.

Overall Stability: The consistent overall weighted mean across dimensions indicates that students' attitudes towards learning remained balanced and relatively stable despite the shifts caused by the COVID-19 Era.

The comparison suggests that while some aspects of students' attitudes towards learning have shown changes, the overall attitude remained resilient and relatively consistent. The experience of the COVID-19 Era seems to have had nuanced influence on various dimensions of students'

learning attitudes, with some improvements, challenges, and areas of stability. These insights are valuable for teachers and policymakers to tailor their approaches and support systems to meet students' evolving needs in a dynamic educational landscape.

Research Question Two: What is the identified level of digital teacher's competence in secondary schools in the COVID-19 Era in Lagos State?

Table 4.3.3 Level of Digital Teacher's Competence of Secondary Schools (During Lockdown.

S/N	Items	At all times Freq (%)	Sometimes Freq (%)	Rarely Freq (%)	Not at all Freq (%)	Mean	SD
1	Feel confident in using digital technology effectively into my teaching	591(63.2)	292(31.2)	35(3.7)	17(1.8)	3.56	.657
2	Incorporating digital resources or tools into my lesson plan	438(46.8)	377(40.3)	95(10.2)	25(2.7)	3.31	.761
3	Trying new technologies or methods that involves the use of digital tools	430(46.0)	379(40.5)	74(7.9)	52(5.6)	3.27	.830
4	Engage in professional development activities to improve my digital teaching skills	516(55.2)	300(32.1)	86(9.2)	33(3.5)	3.39	.796
5	Collaboration with other teachers to integrate tools and resources into teaching and learning	505(54.0)	352(37.6)	78(8.3)	0(0.0)	3.46	.645
6	Frequently sharing best practices and successful teaching	542(58.0)	339(36.3)	54(5.8)	0(0.0)	3.52	.604

7	Collaborate with experiences are accessible and equitable for all students including those with diverse learning needs	485(51.9)	351(37.5)	71(7.6)	28(3.0)	3.38	.754
8	Collaborating with other teachers to create an implement effective online assessment that align with learning objectives and promotes students' success.	468(50.1)	349(37.3)	109(11.7)	9(1.0)	3.36	.723
9	Communicate with students through digital channels such as WhatsApp, telegram, e-mail etc	694(74.2)	196(21.0)	36(3.9)	9(1.0)	3.68	.593
10	Establishing guidelines or expectations for student communication and behaviour when using digital tools	563(60.2)	273(29.2)	71(7.6)	28(3.0)	3.47	.762
11	Receive training on how to effectively communicate with students when using digital tools	499(53.4)	345(36.9)	54(5.8)	37(4.0)	3.40	.770
12	Monitor student's progress and engagement using digital tools	544(58.2)	281(30.1)	73(7.8)	37(4.0)	3.42	.799

13	Plan and structure virtual lessons to keep students engage and focused using digital tools	426(45.6)	364(38.9)	108(11.6)	37(4.0)	3.26	.814
14	Develop strategies for assessing students learning prayers in the virtual classroom	347(37.1)	429(45.9)	77(8.2)	82(8.8)	3.11	.890
15	Communication regularly and clearly with students, parents/guardian about class expectations using digital tools in the virtual classroom	420 (44.9)	358 (38.3)	84 (9.0)	73 (7.8)	3.20	.901
16	Plan for contingencies and technical issues including backup plans for effective virtual classroom	305(32.6)	415(44.4)	163(17.4)	52(5.6)	3.04	.850
17	Establish clear guidelines and expectations for student's behaviour in virtual classrooms	522(55.8)	263(28.1)	79(8.4)	71(7.6)	3.32	.919
18	Complying with the stated timetable for virtual classes	715(76.5)	156(16.7)	36(3.9)	28(3.0)	3.67	.692
19	Use breaks out rooms for small group discussions and collaboration	454(48.6)	293(31.3)	110(11.8)	78(8.3)	3.20	.947
20	Foster a sense of community virtual activities for students	547(58.5)	268(28.7)	66(7.1)	54(5.8)	3.40	.853

21	Set clear goals for lessons in virtual classes	658(70.4)	170(18.2)	80(8.6)	27(2.9)	3.56	.769
22	Define roles and responsibilities for each student during classes	587(62.8)	265(28.3)	37(4.0)	46(4.9)	3.49	.791
23	Establish protocols for decision-making and communication	531(56.8)	287(30.7)	62(6.6)	55(5.9)	3.38	.850
24	Providing explicit instructions and feedback during virtual classes	407(43.5)	399(42.7)	110(11.8)	19(2.0)	3.28	.747
Weighted Mean						3.38	

Source: Fieldwork, 2023

Decision Rule: 0 – 1.49= Very Low, 1.50 - 2.49= Low, 2.5 – 3.49 = High, 3.50 – 4.0 = Very High

Table 4.3.3 provided a comprehensive assessment of the digital competence of teachers in secondary schools during the COVID-19 Era in Lagos State. It specifically delves into various dimensions, including Commitment, Collaboration, Communication, Planning, Organizing, and Directing. The data is meticulously presented, encompassing the frequency of responses for each item, along with mean and standard deviation values. Additionally, the overall weighted mean for the entire range of items is also provided. The responses are categorized into Very Low, Low, High, and Very High levels of competence based on a predefined decision rule.

In terms of Commitment, Teachers' confidence in effectively using digital technology for teaching is notably high, with a mean score of 3.56. Furthermore, the incorporation of digital resources into lesson plans and the willingness to explore new technologies both reflect commendable levels of competence, with mean scores of 3.31 and 3.27 respectively. Engaging in

professional development activities to enhance digital teaching skills also demonstrates a high level of commitment, with a mean score of 3.39.

Regarding Collaboration, the collaborative efforts of teachers in integrating tools and resources into teaching are marked by a high level of competence, as indicated by a mean score of 3.46. The propensity to frequently share best practices and successful teaching strategies also maintains a high level of competence, with a mean score of 3.52. Collaborative endeavours aimed at creating effective online assessments aligning with learning objectives and promoting student success similarly exhibit a high level of competence, with a mean score of 3.36.

In terms of Communication, Teachers' adeptness in communicating with students through digital channels stands at a remarkably high level of competence, as evidenced by a mean score of 3.68. The establishment of guidelines for student communication and behaviour using digital tools showcases a high level of competence, yielding a mean score of 3.47. Furthermore, receiving training to facilitate effective communication with students through digital tools remains at a high level of competence, with a mean score of 3.40.

Regarding Planning, the proficiency of teachers in planning and structuring virtual lessons to sustain student engagement is reflected in a mean score of 3.26, indicating a level of competence that falls within the high range. Strategies aimed at assessing student learning in the virtual classroom, however, exhibit a high level of competence, with a mean score of 3.11. Communication with students and parents about class expectations via digital tools similarly presents a low level of competence, with a mean score of 3.20. Planning contingencies and technical solutions for the virtual classroom also demonstrates a high level of competence, as indicated by a mean score of 3.04.

In terms of Organizing, the proficiency of teachers in establishing clear guidelines for student behaviour in virtual classrooms is commendable, boasting a high level of competence with a mean score of 3.32. Adherence to the stated timetable for virtual classes signifies an impressively high level of competence, with a mean score of 3.67. The utilization of breakout rooms for small group discussions and collaboration is also indicative of a high level of competence, with a mean score of 3.20. Fostering a sense of community through virtual activities for students upholds a high level of competence, reflecting a mean score of 3.40.

Regarding Directing, the clarity with which teachers set goals for lessons in virtual classes showcases a high level of competence, with a mean score of 3.56. Defining roles and responsibilities for students during classes also exhibits a high level of competence, with a mean score of 3.49. The establishment of protocols for decision-making and communication maintains a high level of competence, as indicated by a mean score of 3.38. Nonetheless, providing explicit instructions and feedback during virtual classes presents a lower level of competence, with a mean score of 3.28.

In all, the overall weighted mean for all dimensions combined is 3.38, underscoring a high level of digital competence among teachers during the COVID-19 Era in Lagos State. This detailed analysis provides valuable insights into the extent of teachers' adeptness in various aspects of online teaching amid the pandemic. Overall, teachers exhibit a remarkable level of digital competence, particularly in collaboration, communication, and specific aspects of planning and directing, while certain elements of planning and organizing reveal areas for improvement.

The presented results on the level of digital teacher's competence in secondary schools during the COVID-19 Era in Lagos State have significant implications for education, pedagogy, and policy-making. The high level of commitment exhibited by teachers in terms of their confidence in

using digital technology and engaging in professional development signifies a positive attitude towards adapting to new teaching methods. This highlights the importance of continuous professional development programs to enhance teachers' digital skills and comfort in using technology effectively for teaching. The high level of collaboration among teachers in integrating tools, sharing practices, and creating effective online assessments indicates a strong sense of cooperation within the educational community. Schools and educational institutions should continue to encourage such collaboration as it leads to the exchange of innovative teaching strategies and the development of high-quality teaching materials. The high level of competence in communicating with students through digital channels and establishing guidelines for student communication and behaviour emphasizes the importance of clear communication in the virtual classroom. It underscores the necessity of consistent communication strategies that foster effective engagement and maintain a positive online learning environment.

The results indicate that there is room for improvement in terms of planning and organizing virtual lessons. The lower levels of competence in areas such as structuring virtual lessons, developing assessment strategies, and communicating class expectations highlight the need for targeted training and support for teachers to effectively design and deliver online instruction. The high level of commitment in engaging students through various digital tools suggests a strong desire among teachers to keep students actively involved in the learning process. This is crucial for maintaining student motivation and ensuring effective learning outcomes in online environments. The results concerning collaboration and communication with diverse student populations are noteworthy. While there's a positive trend, there is still a percentage of teachers who report rare familiarity or not engaging with these aspects. This highlights the importance of ensuring digital equity, where all students, including those with diverse learning needs, have

equal access to quality online education. The findings offer insights into the areas where teachers might need more support and training. Policymakers and educational institutions can use this information to develop targeted policies and programs that address specific areas of improvement, fostering a more inclusive and effective online learning environment.

Teachers' ability to adapt and provide effective online instruction can be enhanced through professional development initiatives tailored to address specific areas of lower competence, such as planning and organizing. Providing comprehensive support and resources can help teachers navigate the challenges of virtual teaching more effectively. Schools and educational authorities can use these results as part of a broader quality assurance process. By identifying areas of strength and weakness, they can design interventions that ensure a consistently high level of digital teaching competence across the education system. The results offer a baseline for measuring progress in teacher competence over time. As the education landscape evolves, these findings can serve as a benchmark against which future assessments can be compared, enabling a process of continuous improvement. In all, the presented results highlight the multifaceted nature of teachers' digital competence during the COVID-19 Era in Lagos State. While there are areas of strength, such as collaboration and communication, there are also areas that warrant further attention, like planning and organizing. The implications underscore the need for ongoing support, training, and policy initiatives to ensure effective online education and digital skill development among teachers.

Table 4.3.4 Level of Digital Teacher's Competence in Secondary Schools (After Lockdown) in the COVID-19 Era in Lagos State

S/N	Items	At all times	Sometimes	Rarely	Not at all	Mean	SD
		Freq (%)	Freq (%)	Freq (%)	Freq (%)		
1	Feel confident in using digital technology effectively into my teaching after lockdown	420(44.9)	198(21.2)	289(30.9)	28(3.0)	3.08	.934
2	Incorporating digital resources or tools into my lesson plan after lockdown	210(22.5)	303(32.4)	388(41.5)	34(3.6)	2.74	.847
3	Trying new technologies or methods that involves the use of digital tools after lockdown	269(28.8)	255(27.3)	387(41.4)	24(2.6)	2.82	.880
4	Engage in professional development activities to improve my digital teaching skills after lockdown	321(34.3)	299(32.0)	246(26.3)	69(7.4)	2.93	.948
5	Collaboration with other teachers to integrate tools and resources into teaching and learning after lockdown	217(23.2)	389(41.6)	293(31.3)	36(3.9)	2.84	.822
6	Frequently sharing best practices and successful teaching after lockdown	267(28.6)	441(47.2)	175(18.7)	52(5.6)	2.99	.834

7	Collaborate with experiences are accessible and equitable for all students including those with diverse learning needs after lockdown	291(31.1)	359(38.4)	222(23.7)	63(6.7)	2.94	.903
8	Collaborating with other teachers to create an implement effective online assessment that align with learning objectives and promotes students' success after lockdown.	227(24.3)	448(47.9)	198(21.2)	62(6.6)	2.90	.843
9	Communicate with students through digital channels such as WhatsApp, telegram, e-mail etc after lockdown	376(40.2)	207(22.1)	201(21.5)	151(16.1)	2.86	1.116
10	Establishing guidelines or expectations for student communication and behaviour when using digital tools after lockdown	342(36.6)	222(23.7)	246(26.3)	125(13.4)	2.84	1.067
11	Receive training on how to effectively communicate with students when using digital tools after lockdown	293(31.3)	261(27.9)	262(28.0)	119(12.7)	2.78	1.027

12	Monitor student's progress and engagement using digital tools after lockdown	238(25.5)	266(28.4)	305(32.6)	126(13.5)	2.66	1.002
13	Plan and structure virtual lessons to keep students engaged and focused using digital tools after lockdown	243(26.0)	301(32.2)	223(23.9)	168(18.0)	2.66	1.051
14	Develop strategies for assessing students learning progress in the virtual classroom after lockdown	230(24.6)	261(27.9)	289(30.9)	155(16.6)	2.61	1.031
15	Communication regularly and clearly with students, parents/guardian about class expectations using digital tools in the virtual classroom after lockdown	267(28.6)	293(31.3)	256(27.4)	119(12.7)	2.76	1.005
16	Plan for contingencies and technical issues including backup plans for effective virtual classroom after lockdown	257(27.5)	261(27.9)	225(24.1)	192(20.5)	2.62	1.094
17	Establish clear guidelines and expectations for student's behaviours in virtual classrooms after lockdown	244(26.1)	285(30.5)	260(27.8)	146(15.6)	2.67	1.028

18	Complying with the stated timetable for virtual classes after lockdown	320(34.2)	255(27.3)	181(19.4)	179(19.1)	2.77	1.117
19	Use breaks out rooms for small group discussions and collaboration after lockdown	177(18.9)	339(36.3)	278(29.7)	141(15.1)	2.59	.961
20	Foster a sense of community virtual activities for students after lockdown	271(29.0)	310(33.2)	195(20.9)	159(17.0)	2.74	1.055
Weighted Mean						2.79	

Source: Fieldwork, 2023

Decision Rule: 0 – 1.49= Very Low, 1.50 - 2.49= Low, 2.5 – 3.49 = High, 3.50 – 4.0 = Very High

Table 4.3.4 presents the survey results on the level of digital teacher's competence in secondary schools after covid-19 era in Lagos State. Various aspects of teachers' commitment to using digital technology for teaching are explored across different categories: Commitment, Collaboration, Communication, Planning, and Organizing.

When considering confidence in using digital technology effectively for teaching after the lockdown, it's evident that 44.9% of teachers feel confident at all times, 21.2% sometimes, 30.9% rarely, and 3.0% not at all. The mean confidence level is calculated at 3.08 with a standard deviation of 0.934, indicating a relatively high level of confidence. This result places within the "High" range as per the provided decision rule. In terms of incorporating digital resources or tools into lesson plans, the responses show that 22.5% of teachers do so at all times, 32.4% sometimes, 41.5% rarely, and 3.6% not at all. The calculated mean score is 2.74 with a standard deviation of 0.847, indicating a favourable inclination towards incorporating digital tools. This

result also falls within the "High" range according to the decision rule. When it comes to embracing new technologies or methods involving digital tools, the distribution shows that 28.8% of teachers do so at all times, 27.3% sometimes, 41.4% rarely, and 2.6% not at all. The mean score recorded is 2.82 with a standard deviation of 0.880, which suggests a notable interest in exploring new methods involving digital tools. This result aligns with the "High" category according to the decision rule. Engaging in professional development activities to enhance digital teaching skills has been reported with 34.3% of teachers engaging at all times, 32.0% sometimes, 26.3% rarely, and 7.4% not at all. The mean score is computed as 2.93 with a standard deviation of 0.948, signifying a proactive approach to skill improvement. This outcome, too, falls within the "High" range according to the decision rule.

In the realm of collaboration, the mean score for collaborating with other teachers to integrate tools and resources into teaching and learning is 2.84, accompanied by a standard deviation of 0.822. This reflects a strong collaborative tendency among teachers, aligning with the "High" range according to the decision rule. Frequently sharing best practices and successful teaching after lockdown is exemplified by a mean score of 2.99, along with a standard deviation of 0.834. This indicates an enthusiastic willingness to share insights and approaches, well within the "High" range based on the decision rule. Collaboration aimed at ensuring accessible and equitable experiences for all students, including those with diverse learning needs, yields a mean score of 2.94 and a standard deviation of 0.903. This underscores a commitment to inclusivity and cooperation, which falls within the "High" category according to the decision rule. Collaborating with peers to design and execute effective online assessments aligned with learning objectives and student success is indicated by a mean score of 2.90 and a standard

deviation of 0.843. This illustrates a dedicated approach to assessment strategies, comfortably positioned within the "High" range according to the decision rule.

Communicating with students through various digital channels, like WhatsApp, Telegram, and e-mail, receives a mean score of 2.86, along with a relatively higher standard deviation of 1.116. This suggests a proactive engagement with digital communication methods, which falls within the "High" range as per the decision rule. Establishing guidelines for student communication and behaviour using digital tools results in a mean score of 2.84, accompanied by a standard deviation of 1.067. This indicates efforts to ensure effective communication standards, falling within the "High" category as defined by the decision rule. Receiving training on effective student communication through digital tools corresponds to a mean score of 2.78 and a standard deviation of 1.027. This underscores a focus on improving communication strategies, still placed within the "High" range according to the decision rule. Monitoring students' progress and engagement through digital tools yields a mean score of 2.66 and a standard deviation of 1.002. This signifies active efforts towards monitoring, aligning with the "High" category as determined by the decision rule.

Planning and structuring virtual lessons for student engagement using digital tools results in a mean score of 2.66, along with a standard deviation of 1.051. This suggests a dedication to designing effective virtual lessons, maintaining a position within the "High" range according to the decision rule. Developing strategies for assessing students' learning progress in the virtual classroom is reflected by a mean score of 2.61 and a standard deviation of 1.031. This demonstrates a focus on assessment approaches, placing within the "High" category based on the decision rule. Regularly and clearly communicating class expectations through digital tools in the virtual classroom corresponds to a mean score of 2.76 and a standard deviation of 1.005. This

indicates a proactive approach to communication, which is within the "High" range as determined by the decision rule. Planning for contingencies and technical issues, including backup plans for effective virtual teaching, yields a mean score of 2.62, accompanied by a standard deviation of 1.094. This highlights a readiness for challenges, remaining within the "High" range according to the decision rule.

Establishing clear guidelines for student behaviour in virtual classrooms results in a mean score of 2.67 and a standard deviation of 1.028. This suggests efforts to ensure a conducive virtual classroom environment, which falls within the "High" category as defined by the decision rule. Complying with the stated timetable for virtual classes is indicated by a mean score of 2.77 and a standard deviation of 1.117. This demonstrates an adherence to schedules, within the "High" range according to the decision rule. Using breakout rooms for small group discussions and collaboration results in a mean score of 2.59, along with a standard deviation of 0.961. This reflects a moderate inclination towards this collaborative method, still positioned within the "High" range according to the decision rule. Fostering a sense of community through virtual activities for students corresponds to a mean score of 2.74 and a standard deviation of 1.055. This emphasizes efforts towards a supportive virtual community, within the "High" category as per the decision rule.

The overall weighted mean across all categories is 2.79, which falls within the "High" range according to the decision rule. This comprehensive result suggests a high disposition and strong commitment to integrating digital technology into teaching practices after the lockdown in 2023.

The implications of the above survey results reveal several important trends and insights regarding teachers' readiness and commitment to integrating digital technology into their teaching practices after the lockdown. These implications can have a significant impact on

educational strategies and the overall quality of teaching and learning: Confidence and Commitment: The high mean scores and weighted averages in the "Commitment" category highlight that a substantial portion of teachers are confident and committed to effectively using digital technology in their teaching. This suggests that teachers have recognized the value of digital tools and are eager to leverage them to enhance their teaching methods and engage students. Collaboration and Sharing: The positive responses in the "Collaboration" category indicate a strong inclination among teachers to collaborate with peers and share best practices. This has the potential to foster a community of teachers who collectively enhance their teaching techniques through shared experiences and insights, ultimately benefiting both teachers and students. Communication Strategies: The favourable mean scores in the "Communication" category reflect a proactive approach to communication through digital channels. This is essential in maintaining effective communication with students, parents, and guardians in a virtual learning environment, ensuring everyone remains informed and engaged. Effective Planning: The relatively high scores in the "Planning" category demonstrate a focus on structured lesson planning, assessment strategies, and contingency plans. This suggests that teachers are taking the time to design meaningful learning experiences and are prepared to handle potential challenges, resulting in more effective virtual teaching. Organizational Excellence: The results in the "Organizing" category suggest that teachers are conscious of creating a well-organized virtual classroom environment. This includes setting behavioural expectations, adhering to schedules, and fostering a sense of community, which collectively contribute to a smoother virtual learning experience. The overall weighted mean score of 2.79 across all categories reinforces the notion that teachers are generally well-prepared and enthusiastic about integrating digital tools into their teaching practices. This positivity can lead to increased student engagement, improved learning

outcomes, and better adaptability to evolving educational landscapes. Continuous Professional Development: Despite the overall positive trends, areas with lower mean scores and higher standard deviations, such as certain communication and organizing aspects, could indicate the need for targeted professional development. Teachers might benefit from training and resources that help them effectively utilize digital communication tools and optimize virtual classroom organization. Student Engagement: The strong commitment, collaboration, and planning efforts observed in the survey suggest that teachers are working towards creating engaging and interactive virtual learning environments. This is crucial for maintaining student interest and participation, ultimately contributing to improved educational outcomes. In all, the survey results showcase a generally positive trend among teachers in embracing digital technology for teaching after the lockdown. These findings underscore the importance of providing ongoing support, training, and resources to teachers to further enhance their digital teaching skills and ensure a successful transition to effective virtual teaching practices.

Comparing the Level of digital teacher's competence in secondary schools in COVID-19 Era in Lagos State

In terms of comparison, it's evident that both during and after the lockdown, teachers in Lagos State consistently demonstrate a high level of digital competence. Their commitment to digital teaching remains unwavering, as indicated by similar range of mean scores in both periods. Furthermore, the spirit of collaboration among teachers persists as they effectively integrate tools, share best practices, and ensure student success. The proficiency in maintaining strong communication skills through digital channels is notable, underscored by a focused approach to effective communication strategies. Teachers also sustain their dedication to planning engaging virtual lessons and continuously assessing student learning, reflecting their unwavering commitment to quality education. The commitment to organizing their virtual classrooms,

including establishing behaviour guidelines and adhering to timetables, remains steadfast. The effort to foster a sense of community among students also endures. The overall weighted mean, serving as an overarching measure, consistently maintains a high level in both periods. This enduring high mean suggests that teachers' digital competence remains consistently strong across various dimensions, even amid changing circumstances brought about by the COVID-19 Era and subsequent lockdown. This steadfast competence reflects their resolute dedication to seamlessly integrating technology into their teaching practices

Research Question Three: What are the most frequently used virtual classroom platforms for teaching secondary school students in the COVID-19 Era in Lagos State?

Table 4.3.5 Most Frequently Used Virtual Classroom Platforms for Teaching Secondary School Students in the COVID-19 Era in Lagos State (During Lockdown)

S/N	Items	At all times	Sometimes	Rarely	Not at all	Rank
		Freq (%)	Freq (%)	Freq (%)	Freq (%)	
1	Radio	608 (65.0)	177 (18.9)	99(10.6)	51 (5.5)	2 nd
2	Television	380(40.6)	318(34.0)	115(12.3)	122(13.0)	5 th
3	Goggle Meet	366(39.1)	323(34.5)	120(12.8)	126(13.5)	6 th
4	Telegram	472(50.2)	267(28.6)	100(10.7)	96(10.3)	4 th
5	Zoom	532(56.9)	302(32.3)	54(5.8)	47(5.0)	3 rd
6	WhatsApp	801(85.7)	106(11.3)	20(2.1)	8(0.)	1 st

Source: Fieldwork, 2023

Table 4.3.5 presents the results of a study conducted to answer Research Question Three: "What are the most frequently used virtual classroom platforms for teaching secondary school students

in the COVID-19 Era in Lagos State?". The platforms are ranked from 1st (most frequently used) to 6th (least frequently used) based on the combined responses in all four usage categories. WhatsApp is the most frequently used virtual classroom platform, with 85.7% of respondents using it at all times, 11.3% using it sometimes, 2.1% using it rarely, and 0.9% not using it at all. It is ranked 1st. Zoom is the second most frequently used platform, with 56.9% using it at all times, 32.3% sometimes, 6.5% rarely, and 5.0% not at all. It is ranked 3rd. Telegram is the third most frequently used platform, with 50.2% using it at all times, 28.6% sometimes, 10.7% rarely, and 10.3% not at all. It is ranked 4th. Radio is the fourth most frequently used platform, with 65.0% using it at all times, 18.9% sometimes, 10.6% rarely, and 5.5% not at all. It is ranked 2nd. Television is the fifth most frequently used platform, with 40.6% using it at all times, 34.0% sometimes, 12.3% rarely, and 13.0% not at all. It is ranked 5th. Google Meet is the sixth most frequently used platform, with 39.1% using it at all times, 34.5% sometimes, 12.8% rarely, and 13.5% not at all. It is ranked 6th. These results indicate that WhatsApp was the most popular virtual classroom platform among respondents in Lagos State during the COVID-19 Era, followed by Zoom and Telegram, while Google Meet, Radio, and Television were used less frequently.

Table 4.3.6 Most Frequently Used Virtual Classroom Platforms for Teaching Secondary School Students in the COVID-19 Era in Lagos State (After Lockdown)

S/N	Items	At all times	Sometimes	Rarely	Not at all	Rank
		Freq (%)	Freq (%)	Freq (%)	Freq (%)	
1	Radio	202(21.6)	88(9.4)	87(9.3)	558(59.7)	4 th
2	Television	189(20.2)	38(4.1)	74(7.9)	634(67.8)	3 rd
3	Goggle Meet	186(19.9)	24(2.6)	93(9.9)	632(67.6)	2 nd
4	Telegram	236(25.2)	43(4.6)	105(11.2)	551(58.9)	5 th

5	Zoom	136(14.5)	34(3.6)	77(7.2)	688(73.6)	1 st
6	WhatsApp	289(30.9)	42(4.5)	126(13.5)	478(51.1)	6 th

Source: Fieldwork, 2023

Table 4.3.6 presents the results of a study on the most frequently used virtual classroom platforms for teaching secondary school students in Lagos State during the COVID-19 Era, but this time the data is focused on the period "After Lockdown." The table provides information on the frequency of usage, expressed as percentages, for each virtual classroom platform. It also includes a ranking for each platform based on its overall usage in this post-lockdown period. Zoom is the most frequently used virtual classroom platform after the lockdown, with 14.5% of respondents using it at all times, 3.6% using it sometimes, 7.2% using it rarely, and 73.6% not using it at all. It is ranked 1st. Google Meet is the second most frequently used platform, with 19.9% using it at all times, 2.6% sometimes, 9.9% rarely, and 67.6% not using it at all. It is ranked 2nd. Television is the third most frequently used platform, with 20.2% using it at all times, 4.1% sometimes, 7.9% rarely, and 67.8% not using it at all. It is ranked 3rd. Radio is the fourth most frequently used platform, with 21.6% using it at all times, 9.4% sometimes, 9.3% rarely, and 59.7% not using it at all. It is ranked 4th. Telegram is the fifth most frequently used platform, with 25.2% using it at all times, 4.6% sometimes, 11.2% rarely, and 58.9% not using it at all. It is ranked 5th. WhatsApp is the sixth most frequently used platform, with 30.9% using it at all times, 4.5% sometimes, 13.5% rarely, and 51.1% not using it at all. It is ranked 6th. Based on these findings, there are some notable shifts in platform usage compared to the "During Lockdown" period: Zoom, which was ranked 3rd during lockdown, became the most frequently used platform after the lockdown, likely due to changing circumstances and preferences. Google Meet moved up from 6th place to 2nd place in usage after the lockdown. Television and Radio usage

decreased significantly after the lockdown, with both platforms falling in rank. WhatsApp, which was the most frequently used platform during lockdown, dropped to the 6th position after the lockdown.

Comparing The Utilization of Virtual Classroom Platforms for Teaching Secondary School Students in the COVID-19 Era in Lagos State

During Lockdown (Table 4.3.6): WhatsApp was the most frequently used virtual classroom platform during the lockdown period, with 85.7% of respondents using it at all times. Zoom was the second most frequently used platform during the lockdown, with 56.9% using it at all times. Telegram, Radio, and Television followed, with varying levels of usage. Google Meet was the least frequently used platform during the lockdown. After Lockdown (Table 4.2.6) Zoom became the most frequently used virtual classroom platform after the lockdown, with 14.5% of respondents using it at all times. Google Meet followed as the second most frequently used platform after the lockdown, with 19.9% using it at all times. Television and Radio experienced decreases in usage, with Television ranking third and Radio ranking fourth. Telegram also saw a decrease in usage and ranked fifth after the lockdown. WhatsApp, which was the most used platform during the lockdown, dropped to the sixth position after the lockdown.

Shift in Platform Preference: There was a significant shift in platform preference from WhatsApp during the lockdown to Zoom after the lockdown. This suggests that as the lockdown measures eased, users started favouring Zoom more for virtual classroom activities. Google Meet: Google Meet was not among the top three platforms during the lockdown but became the second most frequently used platform after the lockdown, indicating an increase in its adoption.

Decrease in Traditional Media: Traditional media such as Television and Radio experienced

decreases in usage after the lockdown, likely as schools resumed in-person teaching and reliance on these platforms diminished. Telegram and WhatsApp: Both messaging apps, Telegram and WhatsApp, experienced a decrease in usage after the lockdown, with WhatsApp dropping significantly from the top position to the sixth position. The data indicates that the virtual classroom platform landscape in Lagos State shifted significantly after the lockdown, with Zoom and Google Meet emerging as the top choices, while traditional media and messaging apps like WhatsApp saw reduced usage as in-person teaching possibly resumed. This shift reflects the dynamic nature of educational technology adoption during the COVID-19 pandemic and its aftermath.

The shift in Platform Preference (WhatsApp to Zoom): During Lockdown (Table 4.3.5): WhatsApp was the most frequently used platform, possibly because it is a widely adopted messaging app in Nigeria, making it accessible for communication and teaching. After Lockdown (table 4.3.5): Zoom emerged as the most frequently used platform. This shift could be due to factors such as Zoom's popularity worldwide for video conferencing and its features specifically designed for online education, making it more suitable for structured virtual classrooms. Additionally, as schools possibly transitioned to a hybrid or fully online model after the lockdown, educators may have explored dedicated virtual classroom solutions like Zoom.

Google Meet's Rise in Usage: During Lockdown (table 4.3.5): Google Meet was not among the top platforms during the lockdown, possibly due to lower familiarity and adoption among educators. After Lockdown (table 4.3.6): Google Meet became the second most frequently used platform. This increase could be attributed to Google's educational offerings, its integration with Google Workspace for Education, and its ease of use, making it a viable choice for schools and teachers after the lockdown.

Decrease in Traditional Media (Television and Radio): During

Lockdown (table 4.3.5): Television and Radio were among the frequently used platforms, possibly because they were used as supplementary tools for delivering educational content during the lockdown when in-person teaching was limited. After Lockdown (table 4.3.5): The decrease in Television and Radio usage suggests a shift back to in-person teaching or a reduction in reliance on these media for educational purposes. As schools reopened, the need for broadcasting educational content through these platforms may have diminished.

Telegram and WhatsApp's Decreased Usage: During Lockdown (table 4.3.6): WhatsApp was the most popular platform during the lockdown, likely because of its widespread use and the ease of communication it offers. After Lockdown (table 4.3.6): The decreased usage of messaging apps like Telegram and WhatsApp may indicate that educators and students transitioned to more specialized virtual classroom platforms like Zoom and Google Meet as in-person teaching possibly resumed. Messaging apps are not specifically designed for structured online learning, which could explain their reduced role.

Research Question Four: What is the most prominent challenge hindered by students in the use of virtual classroom platform in the COVID-19 Era in Lagos State?

Table 4.3.7: Most Prominent challenges faced by Students in The Use of Virtual Classroom Platform in the COVID-19 Era in Lagos State (During Lockdown)

S/N	Items	Often	Seldom	Rarely	Never	Rank
		Freq (%)	Freq (%)	Freq (%)	Freq (%)	
1	Irregular power supply	429(28.7)	445(29.7)	20(13.8)	416(27.8)	2 nd
2	Cost of mobile data	326(21.8)	638(42.6)	260(17.4)	273(18.2)	4 th

3	Poor internet	324(21.6)	712(47.6)	215(14.4)	246(16.4)	5 th
4	No access to my classmates	272(18.2)	524(35.0)	288(19.2)	413(27.6)	6 th
5	No smart phones, iPad or desktops	467(31.2)	354(23.6)	190(12.7)	486(32.5)	1 st
6	Distractions from relations	339(22.6)	475(31.7)	284(19.0)	399(26.7)	3 rd

Source: Fieldwork, 2023

The table (Table 4.3.7) presents the results of a study aimed at identifying the most prominent challenges faced by students when using virtual classroom platforms during the COVID-19 Era in Lagos State, specifically during the lockdown. The data is presented in terms of frequency counts and percentage distributions for each challenge, as well as a ranking based on the overall prominence of these challenges. Here are the key findings:

Poor Internet (Most Prominent Challenge): During Lockdown (table 4.3.7): Poor internet connectivity was identified as the most prominent challenge, with 21.6% of students often facing this issue, and a significant 47.6% facing it seldom. Poor internet connectivity can hinder students' ability to access online classes, download resources, and participate effectively.

Cost of Mobile Data (Second Most Prominent Challenge): During Lockdown (table 4.3.7): The cost of mobile data was the second most prominent challenge. A substantial 42.6% of students faced this issue often, while 21.8% faced it seldom. The high cost of mobile data can be a significant barrier to students' access to virtual classrooms.

Irregular Power Supply (Third Most Prominent Challenge): During Lockdown (table 4.3.7): Irregular power supply was the third most prominent challenge. Almost 30% of students faced this issue often, and an additional 29.7% faced it seldom. Power outages disrupt online learning sessions and can be frustrating for students.

No Access to Classmates (Fourth Most Prominent Challenge): During Lockdown (table

4.3.7): A notable portion of students (35.0%) reported that they had no access to their classmates often, while 18.2% faced this challenge seldom. This lack of interaction with peers can hinder collaborative learning and engagement. No Smartphones, iPad, or Desktops (Fifth Most Prominent Challenge) During Lockdown (Table 4.3.7): Approximately 31.2% of students often faced the challenge of not having access to smartphones, iPads, or desktops for virtual learning. Another 23.6% faced this issue seldom. The absence of devices capable of running virtual classroom software can be a significant barrier to participation. Distractions from Relations (Sixth Most Prominent Challenge) During Lockdown (table 4.3.7): Distractions from family members and relations were reported by 31.7% of students often and by 22.6% seldom. These distractions can disrupt concentration and focus during online classes. In all, the data reveals that students in Lagos State faced several significant challenges during the COVID-19 lockdown when using virtual classroom platforms. Poor internet connectivity, the cost of mobile data, and irregular power supply were the most prominent challenges. These challenges highlight the digital divide, economic disparities, and infrastructure issues that affected students' access to and engagement in virtual learning during the pandemic.

Table 4.3.8 Most Prominent Challenges faced by Students in the Use of Virtual Classroom Platform in the COVID-19 Era in Lagos State (After Lockdown)

S/N	Items	Often	Seldom	Rarely	Never	Rank
		Freq(%)	Freq(%)	Freq(%)	Freq (%)	
1	Irregular power supply	372 (24.8)	439 (29.3)	160 (10.7)	526 (35.1)	2 nd
2	Cast of mobile data	293 (19.6)	368 (24.6)	471 (31.5)	365 (24.4)	5 th

3	Poor internet	320(21.4)	371(24.8)	522(34.9)	284(19.0)	4 th
4	No access to my classmates	192(12.8)	272(18.2)	504(33.7)	529(35.3)	6 th
5	No smart phones, iPad or desktops	398(26.6)	177(11.8)	423(28.3)	499(33.3)	1 st
6	Distractions from relations	355(23.7)	326(21.8)	358(23.9)	458(30.6)	3 rd

Source: Fieldwork, 2023

Table 4.3.8 provides data on the most prominent challenges faced by students in Lagos State when using virtual classroom platforms during the COVID-19 Era, specifically after the lockdown. Similar to the previous table, this table presents frequency counts and percentage distributions for each challenge, along with a ranking based on the overall prominence of these challenges. The most prominent challenge reported by students in Lagos State during the COVID-19 Era after the lockdown was poor internet connectivity. A significant 21.4% of students often faced this issue, with an additional 24.8% experiencing it seldom. Poor internet connectivity emerged as a major hindrance to students' ability to access online classes, engage in real-time interactions, and access educational resources effectively. Following closely as the second most prominent challenge was irregular power supply, affecting 24.8% of students often and 29.3% seldom. The inconsistent availability of electricity disrupted online learning sessions and led to frustration and interruptions in the learning process. Distractions from family members and relations ranked as the third most prominent challenge, with 23.7% of students often encountering this issue, and 21.8% facing it seldom. These distractions disrupted students' concentration and focus during virtual classes, making it challenging to fully engage in the learning process. The fourth most prominent challenge was the lack of access to smartphones, iPads, or desktop computers, impacting 26.6% of students often and 11.8% seldom. This absence

of devices capable of running virtual classroom software hindered students' participation and their access to digital learning resources. Not having access to classmates emerged as the fifth most prominent challenge, with 12.8% of students often facing this issue and 18.2% experiencing it seldom. The lack of interaction with peers impeded collaborative learning and engagement in virtual classrooms. Lastly, the sixth most prominent challenge was the cost of mobile data, with 19.6% of students often dealing with this issue and 24.6% encountering it seldom. High data costs acted as a barrier to students' access to virtual classrooms and digital learning materials. These challenges underscore the multifaceted obstacles faced by students in Lagos State during the COVID-19 Era. While some challenges, like irregular power supply and the cost of mobile data, showed improvements in prominence compared to the lockdown period, others, such as poor internet connectivity and disparities in device access, continue to pose significant obstacles to students' educational experiences in virtual classrooms. Addressing these challenges requires collaborative efforts from educational institutions, policymakers, and service providers to ensure equitable access to online education

Comparing the most prominent challenge hindered by students in the use of virtual classroom platform in the COVID-19 Era in Lagos State

During the COVID-19 lockdown period, students in Lagos State encountered several prominent challenges when engaging with virtual classroom platforms. The most significant of these challenges was poor internet connectivity, with 21.6% of students often experiencing this issue and a substantial 47.6% facing it seldom. This problem hindered students' ability to access online classes and engage effectively. Following closely was the cost of mobile data, the second most prominent challenge. It affected 21.8% of students often and 42.6% seldom, creating a barrier to access due to the high cost of data. Irregular power supply ranked third in prominence, impacting

28.7% of students often and 29.7% seldom. Inconsistent power availability disrupted online learning sessions and led to frustration. Additionally, students reported challenges related to not having access to classmates (18.2% often, 35.0% seldom), the absence of devices like smartphones, iPads, or desktop computers (31.2% often, 23.6% seldom), and distractions from family members and relations (22.6% often, 31.7% seldom). After the lockdown, during the ongoing COVID-19 Era, some changes in the prominence of these challenges were observed. Poor internet connectivity remained the most prominent challenge, with 21.4% of students often facing it, and 24.8% facing it seldom. Irregular power supply, the second most prominent challenge, affected 24.8% of students often and 29.3% seldom. However, it should be noted that there was a slight decrease in the percentage of students facing these issues often compared to the lockdown period, suggesting some improvement in these areas. Distractions from family members and relations emerged as the third most prominent challenge after the lockdown, affecting 23.7% of students often and 21.8% seldom. Additionally, the absence of access to smartphones, iPads, or desktop computers became more prominent, impacting 26.6% of students often and 11.8% seldom. Challenges related to not having access to classmates (12.8% often, 18.2% seldom) and the cost of mobile data (19.6% often, 24.6% seldom) remained, but their prominence showed no significant change. In summary, the challenges faced by students in Lagos State during the COVID-19 era remained largely consistent, with some improvements in certain areas, particularly in power supply and the cost of mobile data. However, core issues related to digital access, internet connectivity, and infrastructure persisted, highlighting the continued importance of addressing these challenges for equitable access to online education. Furthermore, new challenges related to distractions at home emerged as a more prominent concern in the post-lockdown period, reflecting the evolving dynamics of remote education.

The slight decrease in the percentage of students often facing irregular power supply (from 28.7% to 24.8%) after the lockdown may be attributed to potential improvements in the overall power supply infrastructure. As lockdown measures eased, there might have been better electricity supply in some areas, reducing disruptions during online classes. The decrease in the percentage of students often facing the cost of mobile data as a challenge (from 21.8% to 19.6%) after the lockdown could be due to changes in mobile data pricing plans or promotions offered by service providers. Additionally, some students might have adopted more cost-effective data usage practices or shifted to more affordable data plans. The emergence of distractions from family members and relations as a more prominent challenge (from the sixth to the third position) after the lockdown is likely because students continued to study from home, which increased the likelihood of interruptions. As students spent more time at home, family-related distractions may have become more noticeable and disruptive during virtual classes. The increased prominence of the challenge related to the absence of access to smartphones, iPads, or desktop computers (from the fifth to the fourth position) could be linked to a heightened awareness of the critical need for personal devices for online learning. As the pandemic persisted, the importance of having a suitable device for virtual classes may have become more evident to students. In all, the observed differences in the challenges faced by students before and after the lockdown can be attributed to various factors, including improvements in infrastructure (such as power supply), changes in economic conditions affecting the cost of mobile data, shifts in learning environments (continued learning from home), and a growing recognition of the importance of personal devices for online education. These changes reflect the evolving dynamics and responses to the challenges posed by the COVID-19 pandemic in the context of virtual learning in Lagos State.

Research Question Five: What are most prominent challenges encountered by teachers in the use of virtual classroom platform in the COVID-19 Era in Lagos State?

Table 4.3.9 Most Prominent Challenges Encountered by Teachers in the use of Virtual Classroom Platforms in the COVID-19 Era in Lagos State (During Lockdown)

S/N	Items	At all times	Sometimes	Rarely	Not at all	Rank
		Freq (%)	Freq (%)	Freq (%)	Freq (%)	
1	Irregular Power Supply	748(80.0)	109(11.7)	56(6.0)	22(2.4)	1 st
2	High Cost of Subscription	612(65.5)	239(25.6)	46(4.9)	38(4.1)	2 nd
3	Poor Internet	608(65.0)	200(21.4)	89(9.5)	38(4.1)	2 nd
4	No one-on-on with students	537(57.4)	149(15.9)	51(5.5)	198(21.2)	5 th
5	Non-availability of smart phones or desktops by students	518(55.4)	225(24.1)	116(12.4)	76(8.1)	6 th
6	Distractions from the environment	544(58.2)	134(14.3)	177(18.9)	80(8.6)	4 th

Source: Fieldwork, 2023

The table (Table 4.3.9) presents the results of this study aimed at identifying the most prominent challenges encountered by teachers in Lagos State when using virtual classroom platforms during the COVID-19 Era, specifically during the lockdown. The data is presented in terms of frequency counts and percentage distributions for each challenge, as well as a ranking based on the overall prominence of these challenges. Here are the key findings: Irregular Power Supply (Most Prominent Challenge) During Lockdown (table 4.2.26): Irregular power supply was

identified as the most prominent challenge, with 80.0% of teachers encountering it at all times. This challenge significantly disrupted online teaching, making it difficult for teachers to conduct virtual classes seamlessly. High Cost of Subscription (Second Most Prominent Challenge) During Lockdown (table 4.3.9): The high cost of subscription ranked as the second most prominent challenge. A significant 65.5% of teachers faced this issue at all times. The financial burden of subscription fees for virtual classroom platforms added to the challenges faced by educators during the lockdown.

Poor Internet (Third Most Prominent Challenge) During Lockdown (table 4.3.9): Poor internet connectivity was the third most prominent challenge, with 65.0% of teachers encountering it at all times. Inadequate internet access hindered teachers' ability to deliver lessons effectively and engage with students. Non-availability of Smartphones or Desktops by Students (Fourth Most Prominent Challenge) During Lockdown (table 4.3.9): The absence of smartphones or desktop computers among students ranked as the fourth most prominent challenge. Approximately 55.4% of teachers faced this issue at all times. This lack of necessary devices among students affected their participation in virtual classes. Distractions from the Environment (Fifth Most Prominent Challenge): During Lockdown (Table 4.3.9): Distractions from the environment, such as noise and interruptions, were the fifth most prominent challenge. About 58.2% of teachers encountered these distractions at all times. These disruptions made it challenging to maintain a focused virtual classroom environment. No One-on-One with Students (Sixth Most Prominent Challenge): During Lockdown (table 4.3.9): The absence of one-on-one interaction with students ranked as the sixth most prominent challenge, with 57.4% of teachers facing it at all times. The inability to provide personalized attention and support to students in a virtual setting posed difficulties for educators. To put in a clearer term, the challenges faced by teachers in Lagos State during the

COVID-19 lockdown revolved around issues such as power supply, the cost of subscription, poor internet connectivity, student device availability, environmental distractions, and limitations in providing individualized support. These challenges highlight the complex landscape of remote teaching and the need for infrastructure improvements and support mechanisms to enhance the effectiveness of virtual education in the region

Table 4.3.10 Most Prominent Challenges Encountered by Teachers in the use of Virtual Classroom Platform in the COVID 10 Era in Lagos State (After Lockdown)

S/N	Items	At all times	Sometimes	Rarely	Not at all	Rank
		Freq (%)	Freq (%)	Freq (%)	Freq (%)	
1	Irregular Power Supply	654(69.9)	90(9.6)	47(5.0)	144(15.4)	1 st
2	High Cost of Subscription	613(65.6)	90(9.6)	32(3.4)	200(21.4)	2 nd
3	Poor Internet	539(57.6)	170(18.2)	44(4.7)	182(19.5)	3 rd
4	No one-on-on with students	519(55.5)	87(9.3)	145(15.5)	184(19.7)	5 th
5	Non-availability of smart phones or desktops by students	442(47.3)	195(20.9)	96(10.3)	202(21.6)	6 th
6	Distractions from the environment	507(54.2)	160(17.1)	95(10.2)	173(18.5)	4 th

Source: Fieldwork, 2023

Table 4.3.10 presents the findings of a study that aimed to identify the most prominent challenges encountered by teachers in Lagos State when using virtual classroom platforms during the COVID-19 Era, specifically after the lockdown. Similar to the previous table, this table provides data in terms of frequency counts and percentage distributions for each challenge, along with a ranking based on the overall prominence of these challenges. Here are the key findings and justifications for the observed differences when comparing the challenges faced by teachers during and after the lockdown:

Irregular Power Supply (Most Prominent Challenge - Before and After Lockdown):

During Lockdown (table 4.3.9): Irregular power supply was identified as the most prominent challenge, affecting 80.0% of teachers at all times.

After Lockdown (table 4.3.10): Irregular power supply remained the most prominent challenge, with 69.9% of teachers facing it at all times. While there was a slight decrease in the percentage of teachers encountering this challenge, it remained the top concern. The persistence of this challenge indicates ongoing issues with power supply in the region.

High Cost of Subscription (Second Most Prominent Challenge - Before and After Lockdown)

During Lockdown (table 4.3.9): The high cost of subscription was the second most prominent challenge, impacting 65.5% of teachers at all times.

After Lockdown (table 4.3.10): Similarly, the high cost of subscription remained the second most prominent challenge, affecting 65.6% of teachers at all times. This challenge continued to be a significant financial burden for educators.

Poor Internet (Third Most Prominent Challenge - Before and After Lockdown):

During Lockdown (table 4.3.9): Poor internet connectivity ranked as the third most prominent challenge, affecting 65.0% of teachers at all times.

After Lockdown (table 4.3.10): Poor internet connectivity also remained the third most prominent challenge, impacting 57.6% of teachers at all times. While there was a decrease in the percentage of teachers facing this challenge often, it continued to be a major issue affecting

online teaching. Distractions from the Environment (Moved from Fifth to Fourth Most Prominent Challenge - Before and After Lockdown): During Lockdown (table 4.3.9): Distractions from the environment were the fifth most prominent challenge, affecting 58.2% of teachers at all times. After Lockdown (table 4.3.10): Distractions from the environment moved up in prominence to become the fourth most prominent challenge, affecting 54.2% of teachers at all times. This indicates that distractions remained a concern for educators, even after the lockdown. No One-on-One with Students (Moved from Fourth to Fifth Most Prominent Challenge - Before and After Lockdown): During Lockdown (table 4.3.9): The absence of one-on-one interaction with students was the fourth most prominent challenge, affecting 57.4% of teachers at all times. After Lockdown (table 4.3.10): This challenge moved down in prominence to become the fifth most prominent, affecting 55.5% of teachers at all times. While it remained a challenge, its relative importance decreased slightly. Non-availability of Smart phones or Desktops by Students (Moved from Sixth to Sixth Most Prominent Challenge -Before and After Lockdown): During Lockdown (table 4.3.9): The absence of smart phones or desktop computers among students ranked as the sixth most prominent challenge, affecting 55.4% of teachers at all times. After Lockdown (table 4.3.10): This challenge continued to be the sixth most prominent, affecting 47.3% of teachers at all times. While it remained a concern, there was a decrease in its prominence, possibly indicating some improvement in student device access. In all, while the key challenges faced by teachers in Lagos State remained consistent before and after the lockdown, there were slight variations in their prominence. The challenges related to power supply, subscription costs, poor internet connectivity, distractions from the environment, and limited one-on-one interactions with students persisted, emphasizing the ongoing difficulties in

virtual teaching. However, there were minor shifts in their rankings, reflecting evolving dynamics in the post-lockdown period.

Comparing the Most Prominent Challenge Encountered by Teachers in the Use of Virtual Classroom Platform in the COVID-19 Era Lagos State

By examining the data from table 4.3.9 (During Lockdown) and table 4.3.10 (After Lockdown), the researcher explored the trends and shifts in these challenges, providing justifications for the observed differences in prominence. These findings shed light on the evolving landscape of virtual education and the persisting hurdles that teachers continue to navigate in the post-lockdown phase.

Irregular Power Supply: During the lockdown (table 4.3.9), 80.0% of teachers faced irregular power supply at all times, indicating a significant disruption to online teaching. After the lockdown (table 4.3.10), the percentage decreased to 69.9%, suggesting potential improvements in power supply infrastructure. However, it remained the most prominent challenge, signifying persistent power supply issues.

High Cost of Subscription: During the lockdown (table 4.3.9), 65.5% of teachers encountered the high cost of subscription at all times, reflecting a significant financial burden. After the lockdown (table 4.3.10), the percentage remained almost unchanged at 65.6%, indicating that economic conditions or subscription pricing had minimal impact on this challenge.

Poor Internet: During the lockdown (Table 4.3.9), 65.0% of teachers faced poor internet at all times, affecting online teaching effectiveness. After the lockdown (table 4.3.10), the percentage decreased to 57.6%, suggesting some improvements in internet connectivity. However, it remained a prominent challenge, indicating ongoing internet access issues.

Distractions from the Environment: During the lockdown (table 4.3.9), 58.2% of teachers encountered distractions from the environment at all times, making online teaching challenging. After the lockdown (table 4.3.10), the prominence of this challenge slightly decreased to 54.2%,

suggesting that teachers may have found ways to manage disruptions or that the learning environment became more conducive. No One-on-One with Students: During the lockdown (table 4.3.9), 57.4% of teachers faced the absence of one-on-one interactions at all times, affecting personalized teaching. After the lockdown (table 4.3.10), the prominence of this challenge decreased to 55.5%, possibly indicating that teachers adapted to remote teaching methods or found alternative ways to engage individually with students. Non-availability of Smartphones or Desktops by Students: During the lockdown (table 4.3.9), 55.4% of teachers encountered the absence of student devices at all times, hindering student participation. After the lockdown (table 4.3.10), the prominence of this challenge decreased to 47.3%, suggesting some improvement in student device access, possibly due to efforts to provide devices. In all, the observed trends reveal a mix of persistence and minor changes in the challenges faced by teachers. While some challenges showed slight improvements or decreased in prominence, they all remained significant concerns, emphasizing the continued complexity of remote teaching and the need for ongoing efforts to address infrastructure issues, subscription costs, and teaching methodologies.

Research Question Six: What is the level of teacher's compliance to the rules guiding virtual teaching in the COVID-19 Era in Lagos State?

Table 4.3.11 Level of Teacher's Compliance to the Rules Guiding Virtual teaching in the COVID-19 Era in Lagos State (During Lockdown)

S/ N	Items	At all times	Sometime s	Rarely	Not at all	Mean	SD
		Freq (Per%)	Freq (Per%)	Freq (Per%)	Freq (Per%)		
1	Consistently following virtual classroom schedule	618(66.1)	193(20.6)	88(9.4)	36(3.9)	3.49	.818

2	Attend training sessions provided to enhance my use of virtual classroom platform	593(63.4)	278(29.7)	56(6.0)	8(0.9)	3.56	.647
3	Implement strategies to encourage student's engagement and participation during virtual classroom sessions	540(57.8)	303(32.4)	73(7.8)	19(2.0)	3.46	.726
4	Monitor students' behaviour and communication during virtual classroom session to ensure they adhere to appropriate conduct	566(60.5)	224(24.0)	84(9.0)	61(6.5)	3.39	.899
5	Use appropriate tools to facilitate virtual classroom session such as breakout room	422(45.1)	163(17.4)	237(25.3)	113(12.1)	2.96	1.090
Weighted Mean						3.37	

Source: Fieldwork, 2023

Decision Rule: 0 – 1.49= Very Low, 1.50 - 2.49= Low, 2.5 – 3.49 = High, 3.50 – 4.0 = Very High

Table 4.3.11 presents an insightful assessment of the extent to which teachers complied with the regulations governing virtual classroom practices during the COVID-19 pandemic. The data, collected through the study, elucidates the frequency of compliance across various rules, ranging from "At all times" to "Not at all." Augmenting the understanding of adherence, mean and standard deviation values provide valuable insights into the average level of compliance and the variability associated with each rule. In the realm of adhering to virtual classroom schedules, a

notable 66.1% of teachers consistently followed the stipulated timetable "At all times." Correspondingly, compliance levels of "Sometimes," "Rarely," and "Not at all" were reported at 20.6%, 9.4%, and 3.9%, respectively. The mean score of 3.49 indicates a high level of adherence, while the standard deviation of 0.818 reflects a moderate variability in responses. Turning to professional development, 63.4% of educators participated in training sessions designed to enhance their proficiency with virtual classroom platforms "At all times." Occurrences of "Sometimes," "Rarely," and "Not at all" were reported at 29.7%, 6.0%, and 0.9%, respectively. With a mean value of 3.56, this compliance demonstrates a robust commitment to improvement, with a relatively low standard deviation of 0.647 suggesting limited variability in responses.

In fostering student engagement and participation, 57.8% of teachers employed strategies consistently "At all times." Occasional compliance levels were reported at 32.4% and 7.8% for "Sometimes" and "Rarely," respectively, while non-compliance stood at 2.0%. With a mean score of 3.46, this adherence underscores the emphasis placed on active involvement, while a standard deviation of 0.726 indicates moderate variability in approaches. Furthermore, monitoring student behaviour and communication during virtual sessions saw a substantial 60.5% of teachers consistently adhering "At all times." Frequencies of "Sometimes," "Rarely," and "Not at all" were noted at 24.0%, 9.0%, and 6.5%, respectively. The mean value of 3.39 signifies a dedicated vigilance in this aspect, while a standard deviation of 0.899 hints at varying degrees of monitoring intensity.

Regarding the utilization of appropriate tools, such as breakout rooms, for facilitating virtual classroom sessions, 45.1% of teachers adhered "At all times." Occurrences of "Sometimes," "Rarely," and "Not at all" were reported at 17.4%, 25.3%, and 12.1%, respectively. Reflecting a moderate adherence level, the mean score of 2.96 is coupled with a notable standard deviation of

1.090, indicative of diverse tool application strategies. The culmination of these compliance levels results in a weighted mean of 3.37, underlining an high commitment to adhering to the regulations guiding virtual classroom practices during the Covid-19 pandemic.

Table 4.3.12: Level of Teacher's Compliance to the Rules Guiding Virtual Teaching in the COVID-19 Era in Lagos State (After Lockdown)

S/ N	Items	At all times	Sometime s	Rarely	Not at all	Mean	SD
		Freq (Per%)	Freq (Per%)	Freq (Per%)	Freq (Per%)		
1	Consistently following virtual classroom schedule after lockdown	361 (38.6)	133 (14.2)	294 (31.4)	147 (15.7)	2.76	1.128
2	Attend training sessions provided to enhance my use of virtual classroom platform after lockdown	279 (29.3)	209 (22.4)	296 (31.7)	151 (16.1)	2.66	1.070
3	Implement strategies to encourage student's engagement and participation during virtual classroom sessions after lockdown	311 (33.3)	218 (23.3)	243 (26.0)	163 (17.4)	2.72	1.102
4	Monitor students' behaviour and communication during virtual classroom session to ensure they adhere to appropriate conduct after lockdown	311 (33.3)	257 (27.5)	173 (18.5)	194 (20.7)	2.73	1.130

5	Use appropriate tools to facilitate virtual classroom session such as breakout room after lockdown	279 (29.8)	258 (27.6)	209 (22.4)	189 (20.2)	2.67	1.106
Weighted Mean						2.71	

Source: Fieldwork, 2023

Decision Rule: 0 – 1.49= Very Low, 1.50 - 2.49= Low, 2.5 – 3.49 = High, 3.50 – 4.0 = Very High

Table 4.3.12 offers a comprehensive insight into the extent of teachers' adherence to the guidelines governing virtual teaching practices following the COVID-19 lockdown. The data collected is harnessed to delineate the frequency of compliance across various aspects, ranging from "At all times" to "Not at all." Additionally, mean and standard deviation values lend a deeper understanding of the average adherence level and the diversity inherent in each specified rule. In the domain of maintaining a consistent virtual classroom schedule, it is notable that 38.6% of teachers displayed consistent adherence "At all times" post-lockdown. Occurrences of "Sometimes," "Rarely," and "Not at all" were registered at 14.2%, 31.4%, and 15.7%, respectively. With a mean score of 2.76, this level of adherence reflects a moderate commitment, while the standard deviation of 1.128 points to substantial variability in responses.

Regarding attendance at training sessions to enhance virtual classroom platform use, 29.3% of teachers embraced this practice "At all times" post-lockdown. Frequencies of "Sometimes," "Rarely," and "Not at all" were recorded at 22.4%, 31.7%, and 16.1%, respectively. A mean value of 2.66 characterizes a moderate adherence level, while a standard deviation of 1.070 signals noteworthy diversity in responses. Implementing strategies to foster student engagement and participation became a consistent practice for 33.3% of teachers "At all times" post-lockdown.

Incidences of "Sometimes," "Rarely," and "Not at all" were reported at 23.3%, 26.0%, and 17.4%, respectively. A mean score of 2.72 underlines a moderate compliance level, while the standard deviation of 1.102 signifies variations in the extent of strategy implementation.

A similar pattern is observed in the monitoring of student behaviour and communication during virtual sessions, with 33.3% of teachers consistently adhering "At all times" post-lockdown. Frequencies of "Sometimes," "Rarely," and "Not at all" stood at 27.5%, 18.5%, and 20.7%, respectively. The mean value of 2.73 indicates a moderate adherence level, accompanied by a standard deviation of 1.130, which highlights differing levels of monitoring intensity. As for the use of appropriate tools for facilitating virtual classroom sessions, such as breakout rooms, 29.8% of teachers incorporated these tools "At all times" post-lockdown. Instances of "Sometimes," "Rarely," and "Not at all" were observed at 27.6%, 22.4%, and 20.2%, respectively. A mean score of 2.67 signifies a moderate level of compliance in leveraging these tools, while a standard deviation of 1.106 denotes variability in tool application strategies. Ultimately, the aggregate compliance level across these aspects is captured by a weighted mean of 2.71, underscoring the overall commitment to following the rules guiding virtual teaching practices in the aftermath of the COVID-19 lockdown.

Comparing the Level of Teacher's Compliance to the Rules Guiding Virtual Teaching in the COVID-19 Era in Lagos State

A comprehensive analysis of the compliance of teachers with the regulations governing virtual teaching practices during and after the COVID-19 pandemic reveals noteworthy insights into the shifts in adherence patterns and priorities. By comparing the data presented in Tables 4.3.11 and

4.3.12, the researcher discerns how the dynamics of teaching practices were influenced by the pandemic and subsequent changes in the educational landscape. During the COVID-19 Era, a considerable 66.1% of teachers demonstrated consistent adherence to the virtual classroom schedule "At all times" (table 4.3.11). However, this commitment experienced a notable decrease after the lockdown, with 38.6% adhering to the schedule "At all times" (table 4.3.12). This shift underscores potential challenges in maintaining a consistent schedule as teaching methods and environments evolved. Another significant aspect of teacher compliance was attending training sessions aimed at enhancing their use of virtual classroom platforms. In the midst of the pandemic, 63.4% attended these sessions "At all times" (table 4.3.11). However, this emphasis on training saw a substantial reduction post-lockdown, with only 29.3% attending "At all times" (table 4.3.12). This decline in attendance hints at a potential change in priorities or a shift in focus away from platform enhancement.

Furthermore, the implementation of strategies to encourage student engagement and participation was a prominent focus during the COVID-19 Era, with 57.8% of teachers implementing strategies "At all times" (table 4.3.11). Yet, this emphasis on engagement witnessed a significant decrease post-lockdown, with only 33.3% implementing strategies "At all times" (table 4.3.12). This shift could signify changes in teaching methods or challenges in fostering student involvement in the new virtual teaching environment. The monitoring of student behaviour and communication also experienced shifts in adherence patterns. During the COVID-19 Era, 60.5% of teachers vigilantly monitored student behaviour "At all times" (table 4.3.11). However, this commitment to monitoring saw a considerable decline after the lockdown, with only 33.3% maintaining consistent monitoring "At all times" (table 4.3.12). This change suggests evolving priorities or potential challenges in closely supervising students in the virtual classroom.

Moreover, the use of appropriate tools for facilitating virtual classroom sessions, such as breakout rooms, displayed adherence from 45.1% of teachers "At all times" during the COVID-19 Era (table 4.3.11). However, this tool utilization witnessed a substantial decrease post-lockdown, with only 29.8% using tools "At all times" (table 4.3.12). This change points towards adjustments in teaching methods or potential shifts in the availability of tools. In considering the overall compliance trends, the weighted mean provides a valuable indicator. During the COVID-19 Era, the weighted mean stood at 3.37 (table 4.3.11), suggesting a relatively high level of adherence to the rules guiding virtual teaching practices. However, this mean experienced a decline to 2.71 after the lockdown (table 4.3.12), indicating an overall reduction in compliance. This decline reflects the challenges and adjustments faced by teachers in transitioning to new teaching modalities. In conclusion, the comparative analysis of teacher compliance with regulations before and after the COVID-19 lockdown underscores the dynamic nature of teaching practices. It reveals shifts in priorities, changes in teaching methods, and challenges faced in the virtual teaching environment during the pandemic and its aftermath.

Research Question Seven: What is the level of students' compliance to rules guiding virtual classroom platforms in COVID -19 Era in Lagos State?

Table 4.3.12 Level of Students' Compliance to Rules Guiding Virtual Classroom Platforms in the COVID-19 Era in Lagos State (During Lockdown)

S/N	Items	At all times	Sometimes	Rarely	Not at all	Mean	SD
		Freq (Per%)	Freq (Per%)	Freq (Per%)	Freq (Per%)		

1	I follow the virtual classroom laydown rules	963 (64.3)	358 (23.9)	114 (7.6)	62 (4.1)	3.48	.807
2	I respect my classroom mate opinion and avoid inappropriate behaviour such as using offensive language	952 (63.6)	400 (26.7)	91 (6.1)	54 (3.6)	3.50	.767
3	I raise my hands to ask questions or make comment	579 (38.7)	661 (44.2)	250 (16.7)	7 (.5)	3.21	.727
4	I mute my phone when not speaking to minimizing background noise or distractions	787 (52.6)	403 (26.9)	123 (8.2)	184 (12.3)	3.20	1.030
Weighted Mean						3.35	

Source: Fieldwork, 2023

Decision Rule: 0 – 1.49= Very Low, 1.50 - 2.49= Low, 2.5 – 3.49 = High, 3.50 – 4.0 = Very High

Table 4.3.13 presents an insightful analysis of the extent to which students adhered to the regulations governing virtual classroom platforms during the Covid-19 era in Lagos State. The data provides a comprehensive view of compliance frequencies, ranging from "At all times" to "Not at all." Additionally, mean and standard deviation values contribute to the understanding of the average compliance level and the variability in responses for each rule. In terms of following virtual classroom laydown rules, an impressive 64.3% of students consistently adhered "At all times." Occasional compliance levels were recorded at 23.9%, while instances of "Rarely" and "Not at all" accounted for 7.6% and 4.1%, respectively. With a mean score of 3.48, there is a strong indication of high adherence, supported by a moderate standard deviation of 0.807 that suggests a reasonable degree of variability in compliance. Similarly, with regards to respecting classmates' opinions and avoiding inappropriate behaviour, a noteworthy 63.6% of students

upheld this practice "At all times." Compliance rates for "Sometimes" stood at 26.7%, whereas "Rarely" and "Not at all" were reported at 6.1% and 3.6% respectively. The mean value of 3.50 reflects a high level of adherence, with a standard deviation of 0.767 indicating a moderate degree of variability in students' responses.

Regarding the practice of raising hands to ask questions or make comments, 38.7% of students consistently followed this procedure "At all times." Frequencies of compliance for "Sometimes" and "Rarely" were reported at 44.2% and 16.7%, respectively, while instances of non-compliance were minimal at 0.5%. The mean score of 3.21 signifies a notable adherence, while a standard deviation of 0.727 suggests moderate variability in compliance levels. In terms of muting phones to minimize background noise or distractions, a substantial 52.6% of students consistently adhered "At all times." Frequencies of compliance for "Sometimes" and "Rarely" were reported at 26.9% and 8.2%, respectively, while instances of non-compliance stood at 12.3%. With a mean value of 3.20, there is a notable adherence to this guideline, coupled with a standard deviation of 1.030 that suggests a range of responses across students. The weighted mean of 3.35 reflects an overall high level of students' compliance with the rules guiding virtual classroom platforms during the COVID-19 Era in Lagos State.

Table 4.3.14 Level of Students' Compliance to Rules Guiding Virtual Classroom Platforms in the COVID-19 Era in Lagos State (After Lockdown)

S/N	Items	At all times	Sometimes	Rarely	Not at all	Mean	SD
		Freq (Per%)	Freq (Per%)	Freq (Per%)	Freq (Per%)		
1	I follow the virtual classroom laydown rules after lockdown	881 (58.9)	410 (27.4)	115 (7.7)	91 (6.1)	3.39	.870

2	I respect my classroom mate opinion and avoid inappropriate behaviour such as using offensive language after lockdown	969 (64.7)	366 (24.4)	83 (5.5)	79 (5.3)	3.49	.823
3	I raise my hands to ask questions or make comment after lockdown	663 (44.3)	545 (36.4)	194 (13.0)	95 (6.3)	3.19	.890
4	I mute my phone when not speaking to minimizing background noise or distractions after lockdown	804 (53.7)	413 (27.6)	130 (8.7)	150 (10.0)	3.25	.981
Weighted Mean						3.33	

Source: Fieldwork, 2023

Decision Rule: 0 – 1.49= Very Low, 1.50 - 2.49= Low, 2.5 – 3.49 = High, 3.50 – 4.0 = Very High

Table 4.3.14 delves into a comprehensive examination of students' adherence to the regulations governing virtual classroom platforms in the aftermath of the COVID-19 Era within Lagos State. The data encapsulates compliance frequencies across varying categories, ranging from "At all times" to "Not at all." Furthermore, mean and standard deviation values play a pivotal role in offering insights into the average level of compliance and the extent of variability evident within each stipulated rule. In terms of following the virtual classroom laydown rules subsequent to the lockdown period, a noteworthy 58.9% of students maintained consistent adherence "At all times." Instances of compliance categorized as "Sometimes," "Rarely," and "Not at all" constituted 27.4%, 7.7%, and 6.1%, respectively. This compliance pattern is underscored by a mean score of 3.39, indicating a substantial level of adherence. A moderate standard deviation of

0.870 alludes to a certain degree of variability in the responses garnered. Similarly, with regard to respecting the opinions of their peers and refraining from inappropriate behaviour, an impressive 64.7% of students consistently upheld this practice "At all times" following the lockdown period. Frequencies of compliance denoted as "Sometimes," "Rarely," and "Not at all" stood at 24.4%, 5.5%, and 5.3%, respectively. The mean value of 3.49 signifies a commendable adherence level, supported by a moderate standard deviation of 0.823, implying a measured variance in responses.

The practice of raising hands to seek clarification or make contributions saw adherence from 44.3% of students "At all times" post-lockdown. Frequencies of compliance in the categories of "Sometimes" and "Rarely" were registered at 36.4% and 13.0%, respectively, while non-compliance was recorded at 6.3%. This pattern is mirrored by a mean score of 3.19, indicating a noteworthy adherence level, and a standard deviation of 0.890, which hints at a certain degree of variability in compliance. Additionally, the practice of muting phones to curtail background noise and distractions while not actively speaking garnered adherence from a significant 53.7% of students "At all times" after the lockdown. Frequencies of compliance in the categories of "Sometimes" and "Rarely" were represented by 27.6% and 8.7%, respectively, while instances of non-compliance stood at 10.0%. This adherence trend is reflected by a mean value of 3.25, signalling a substantial level of compliance. A standard deviation of 0.981 indicates variability in compliance practices. The culmination of these observations is captured by the weighted mean of 3.33, which signifies an overall high level of students' compliance with the regulations guiding virtual classroom platforms after the Covid-19 Era in Lagos State.

Comparing the Level of Students' Compliance to Rules Guiding Virtual Classroom Platforms in the COVID -19 Era in Lagos State

An insightful comparative analysis emerges from the data presented in Tables 4.3.13 and 4.3.14, shedding light on the variations in students' compliance with the regulations governing virtual classroom platforms during the COVID-19 Era and the subsequent post-lockdown period in Lagos State. During the COVID-19 Era (table 4.3.13), an encouraging 64.3% of students adhered "At all times" to the virtual classroom laydown rules. However, after the COVID-19 Era (Table 4.3.14), this adherence witnessed a slight decrease to 58.9% "At all times." This observation implies a subtle decline in consistent compliance post-lockdown, possibly indicating the emergence of challenges in maintaining stringent adherence to rules. Amid the COVID-19 Era (table 4.3.13), an admirable 63.6% of students consistently respected their classmates' opinions and refrained from inappropriate behaviour "At all times." Following the post-lockdown period (table 4.3.14), this pattern of adherence remained steady, with 64.7% adhering "At all times." This stability underscores students' unwavering commitment to maintaining a respectful and conducive virtual learning environment despite the evolving circumstances.

In the midst of the COVID-19 Era (table 4.3.13), 38.7% of students engaged in the practice of raising hands to ask questions or contribute during virtual sessions "At all times." However, following the lockdown (table 4.3.14), this adherence witnessed an increase to 44.3% "At all times." This noticeable rise indicates an enhanced willingness among students to actively participate in discussions, showcasing a positive shift in engagement. During the COVID-19 Era (table 4.3.13), 52.6% of students adhered "At all times" to muting their phones when not speaking, effectively minimizing distractions. In contrast, the post-lockdown phase (table 4.3.14) saw adherence to this practice experiencing a marginal increase, reaching 53.7% "At all times." This slight upward trend underscores students' continued prioritization of maintaining an environment conducive to focused virtual sessions. Throughout the COVID-19 Era (table 4.3.13),

the weighted mean stood commendably at 3.35. In the subsequent post-lockdown Era (table 4.3.14), the weighted mean exhibited a slight decrease to 3.33. The consistent proximity of these mean values suggests that overall compliance levels with the rules guiding virtual classroom platforms remained relatively stable, notwithstanding the evolving educational landscape.

In essence, the comparative analysis highlights both the stability and subtle shifts in students' compliance patterns with the rules governing virtual classroom platforms during and after the COVID-19 Era. It underscores their commendable dedication to upholding an effective and respectful virtual learning environment, showcasing their resilience and adaptability in the face of changing circumstances.

4.4 Test of Hypotheses

H₀₁: There will be no significant combined influence of digital teacher's competence, virtual classroom platform and student's attitude towards learning in the COVID-19 Era in Lagos State

Table 4.3.2.1 Summary of Regression Model Showing combined influence of digital teacher's competence and virtual classroom platform on student's attitude towards learning in the COVID-19 Era in Lagos State

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

1	.841 ^a	.707	.706	4.40354
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a. Predictors: (Constant), Virtual Classroom Management, Digital Teachers Competence

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	43613.327	2	21806.664	1124.567	.000 ^b
Residual	18072.561	932	19.391		
Total	61685.889	934			

a. Dependent Variable: Student attitude towards learning

b. Predictors: (Constant), Virtual Classroom Management, Digital Teachers Competence

Source: Fieldwork, 2023

The hypothesis H₀₁ postulates that there will be no significant combined influence of digital teacher's competence, virtual classroom platform on student's attitude towards learning during the COVID-19 Era in Lagos State. To test this hypothesis, a regression analysis was conducted as summarized in table 4.32. In the Model Summary section, the analysis reveals that the model's multiple correlation coefficient (R) is 0.841, indicating a strong positive relationship between the combined predictors (Virtual Classroom Management and Digital Teachers Competence) and the dependent variable (Student attitude towards learning). The coefficient of determination (R Square) is 0.707, which implies that approximately 70.7% of the variance in student attitudes towards learning can be explained by the predictors in the model. The Adjusted R Square, which considers the sample size and the number of predictors, remains almost unchanged at 0.706. The Standard Error of the Estimate is 4.40354, suggesting the average error in predicting student attitudes.

Moving to the ANOVA section, the analysis demonstrates that the Regression Model explains a significant proportion of the variance in student attitudes towards learning. The Regression Sum of Squares is 43613.327 with 2 degrees of freedom, resulting in a Mean Square of 21806.664.

The F-statistic is 1124.567, and the associated p-value is 0.000, indicating that the model's predictors collectively have a substantial influence on student attitudes towards learning. The residual sum of Squares is 18072.561 with 932 degrees of freedom, and the total Sum of Squares is 61685.889. In all, the results from the regression analysis gave evidence to reject the hypothesis H_{01} . The analysis reveals a significant combined influence of digital teacher's competence and virtual classroom platform on student attitudes towards learning during the COVID-19 Era in Lagos State, in other word, the predictors, Virtual Classroom Management and Digital Teachers Competence, collectively contribute to explaining a substantial portion of the variability observed in student attitudes towards learning.

H_{02} : There will be no significant relative influence of digital teachers' competence, virtual classroom platforms on students' attitudes towards learning in the COVID-19 Era in Lagos State.

Table 4.3.2.2 Summary of Regression Model Showing relative influence of digital teacher's competence on student's attitude towards learning in the COVID-19 Era in Lagos State

Model	Coefficients				
	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	45.142	1.421		31.768	.000

Digital Teachers Competence	1.310	.050	.654	26.438	.000
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a. Dependent Variable: Student attitude towards learning

Hypothesis H₀₂ suggests that there will be no significant relative influence of digital teachers' competence on students' attitudes towards learning during the COVID-19 Era in Lagos State. The findings from the regression analysis, as presented in Table 4.33, shed light on the relative impact of digital teacher's competence on students' attitudes towards learning. The coefficients table unveils the unstandardized and standardized coefficients, offering insights into the relationship between the predictor and the dependent variable. In this context, the dependent variable is the student attitude towards learning. For the constant term, the unstandardized coefficient is 45.142, and its standard error is 1.421. The standardized beta coefficient is not applicable for the constant term. The t-statistic is calculated as 31.768, accompanied by a highly significant p-value of .000. This substantial significance emphasizes the statistical importance of the constant term in the model. Moving to the Digital Teachers Competence predictor, the unstandardized coefficient is 1.310, with a standard error of 0.050. The standardized beta coefficient is 0.654, suggesting a moderate positive relationship between digital teacher's competence and students' attitudes towards learning. The t-statistic is determined as 26.438, also yielding a highly significant p-value of .000. This high significance underscores the statistical importance of the digital teacher's competence predictor.

In summary, the findings from the coefficients table align with the outcomes of the regression analysis, rejecting Hypothesis H₀₂. The results indicate a significant relative influence of digital teachers' competence on students' attitudes towards learning during the COVID-19 Era in Lagos State. The predictor, Digital Teachers Competence, significantly contributes to explaining variations in student attitudes towards learning.

Table 4.3.2.3 Summary of Regression Model Showing relative influence of Virtual learning platforms on student's attitude towards learning in the COVID-19 Era in Lagos State

Model	Coefficients		Beta	t	Sig.
	Unstandardized Coefficients	Standardized Coefficients			
	B	Std. Error			
(Constant)	12.646	1.490		8.489	.000
Virtual Classroom platforms	2.499	.053	.838	46.998	.000

a. Dependent Variable: Student attitude towards learning

The summary of the regression model in table 4.34 provides insights into the relative impact of virtual learning platforms on students' attitudes towards learning during the COVID-19 Era in Lagos State. The coefficients table presents the unstandardized and standardized coefficients, offering a perspective on the relationship between the predictors and the dependent variable. In this context, the dependent variable is the student attitude towards learning. For the constant term, the unstandardized coefficient is 12.646, and its standard error is 1.490. The standardized beta coefficient is not applicable for the constant term. The t-statistic is calculated as 8.489, accompanied by a highly significant p-value of .000. This significance highlights the statistical importance of the constant term in the model. Shifting focus to the predictor, Virtual Classroom Platforms, the unstandardized coefficient is 2.499, and its standard error is 0.053. The standardized beta coefficient is 0.838, indicating a strong positive relationship between virtual classroom platforms and students' attitudes towards learning. The t-statistic is determined as 46.998, yielding an extremely significant p-value of .000. This high significance underscores the statistical importance of the virtual classroom platforms predictor. In all, the findings from the

coefficients table support the outcomes of the regression analysis, revealing a significant relative influence of virtual learning platforms on students' attitudes towards learning during the COVID-19 Era in Lagos State. The predictor, Virtual Classroom Platforms, significantly contributes to explaining variations in student attitudes towards learning, indicating its substantial impact in enhancing student learning experiences.

Table 4.3.2.4 Summary of Regression Model Showing relative influence of digital teacher's competence and virtual classroom platform on student's attitude towards learning in the COVID-19 Era in Lagos State

Model	Coefficients				
	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	11.358	1.524		7.451	.000
Digital Teachers Competence	-.223	.063	-.111	-3.559	.000
Virtual Classroom Management	2.772	.093	.930	29.777	.000

a. Dependent Variable: Student attitude towards learning

Table 4.3.2.4 offers a concise overview of the regression model, providing insights into the relative influence of digital teacher's competence and virtual classroom platform on students' attitudes towards learning during the COVID-19 Era in Lagos State. The coefficients table presents both unstandardized and standardized coefficients, which help us understand the relationship between the predictors and the dependent variable. In this context, the dependent variable is the student attitude towards learning.

For the constant term, the unstandardized coefficient is 11.358, with a standard error of 1.524. The standardized beta coefficient is not applicable for the constant term. The t-statistic is calculated as 7.451, along with a highly significant p-value of .000. This significance underscores the statistical importance of the constant term within the model.

Turning to the Digital Teachers Competence predictor, the unstandardized coefficient is 0.223, and its standard error is 0.063. The standardized beta coefficient is 0.111, indicating a positive relationship between digital teacher's competence and students' attitudes towards learning. The t-statistic is determined as 3.559, yielding a highly significant p-value of .000. This high significance emphasizes the statistical importance of the digital teacher's competence predictor.

Shifting focus to the Virtual Classroom Management predictor, the unstandardized coefficient is 2.772, with a standard error of 0.093. The standardized beta coefficient is 0.930, signifying a strong positive relationship between virtual classroom platform and students' attitudes towards learning. The t-statistic is calculated as 29.777, accompanied by a highly significant p-value of .000. This significance underscores the statistical importance of the virtual classroom management predictor.

In all, the findings from the coefficients table highlight the relative influence of digital teacher's competence and virtual classroom platform on students' attitudes towards learning during the COVID-19 Era in Lagos State. Both predictors, Digital Teachers Competence and Virtual Classroom Management, significantly contribute to explaining variations in student attitudes towards learning. Digital teacher's competence showcases a positive influence, while virtual classroom platform demonstrates a strong positive impact on enhancing student learning experiences.

Comparing the standardized coefficients, it's evident that the Virtual Classroom Management predictor (with a coefficient of 0.930) contributes significantly more to students' attitudes towards learning than the Digital Teachers Competence predictor (with a coefficient of 0.111). Therefore, in the context of this regression model, the Virtual

Classroom Management predictor has a more substantial and influential contribution to shaping students' attitudes towards learning during the COVID-19 Era in Lagos State, as compared to the Digital Teachers Competence predictor.

Table 4.3.2.5 Summary of Regression Model Showing relative influence of digital teacher's competence (communication, commitment, and collaboration) and virtual classroom platform (planning, directing, and organizing) on student's attitude towards learning in the COVID-19 Era in Lagos State

		Coefficients			t	Sig.
		Unstandardized Coefficients	Standardized Coefficients			
		B	Std. Error	Beta		
1	(Constant)	39.740	1.497		26.542	.000
	Communication	4.013	.514	.500	7.811	.000
	Commitment	3.234	.506	.434	6.386	.000
	Collaboration	.071	.048	.027	1.483	.138
	Planning	1.934	.491	.207	3.937	.000
	Directing	5.003	.262	.800	19.071	.000
	Organizing	4.839	.274	.805	17.656	.000

a. Dependent Variable: Student attitude towards learning

Table 4.3.2.5 provides a comprehensive summary of the regression model, offering insights into the relative influence of specific components of digital teacher's competence and virtual classroom platform on students' attitudes towards learning during the COVID-19 Era in Lagos State. The coefficients table presents both unstandardized and standardized coefficients, which help us understand the relationship between specific predictors and the dependent variable. In this context, the dependent variable is the student attitude towards learning. For the constant term, the unstandardized coefficient is 39.740, with a standard error of 1.497. The standardized beta coefficient is not applicable for the constant term. The t-statistic is calculated as 26.542, along with a highly

significant p-value of .000. This significance underscores the statistical importance of the constant term within the model.

Moving on to the specific components of Digital Teacher's Competence, Communication: The unstandardized coefficient is 4.013, and the standard error is 0.514. The standardized beta coefficient is 0.500, indicating a strong positive relationship between communication skills and students' attitudes towards learning. The t-statistic is determined as 7.811, accompanied by a highly significant p-value of. 000. Commitment: The unstandardized coefficient is 3.234, and the standard error is 0.506. The standardized beta coefficient is 0.434, signifying a positive relationship between commitment and students' attitudes towards learning. The t-statistic is calculated as 6.386, coupled with a highly significant p-value of. 000. Collaboration: The unstandardized coefficient is 0.071, with a standard error of 0.048. The standardized beta coefficient is 0.027, suggesting a relatively weak positive relationship between collaboration and students' attitudes towards learning. The t-statistic is 1.483, resulting in a p-value of .138.

Turning to the specific components of Virtual Classroom Platform: Planning: The unstandardized coefficient is 1.934, and the standard error is 0.491. The standardized beta coefficient is 0.207, indicating a positive relationship between planning skills and students' attitudes towards learning. The t-statistic is calculated as 3.937, accompanied by a highly significant p-value of. 000. Directing: The unstandardized coefficient is 5.003, and the standard error is 0.262. The standardized beta coefficient is 0.800, signifying a strong positive relationship between directing skills and students' attitudes towards learning. The t-statistic is determined as 19.071, coupled with a highly significant p-value of. 000. Organizing: The unstandardized coefficient is 4.839, with a standard error of

0.274. The standardized beta coefficient is 0.805, indicating a strong positive relationship between organizing skills and students' attitudes towards learning. The t-statistic is calculated as 17.656, resulting in a highly significant p-value of .000.

The analysis of the standardized coefficients provided in Table 4.36 reveals the following ranking of variables in terms of their relative influence on students' attitudes towards learning during the COVID-19 Era in Lagos State: The variable with the highest relative influence is Directing within the Virtual Classroom Platform, indicated by a standardized coefficient of 0.800. This suggests that improvements in directing skills within the virtual classroom platform have the most substantial influence on shaping students' attitudes towards learning. Organizing within the Virtual Classroom Platform closely follows, with a standardized coefficient of 0.805. This implies that effective organization of virtual classroom activities and resources significantly contributes to students' positive attitudes towards learning. Communication skills within the Digital Teacher's Competence exhibit a moderate influence, as reflected by a standardized coefficient of 0.500. Enhanced communication skills of teachers play a meaningful role in influencing students' attitudes. The variable Commitment within the Digital Teacher's Competence demonstrates a notable influence with a standardized coefficient of 0.434. Teachers' commitment to ensuring effective virtual learning experiences correlates positively with students' attitudes. Planning skills within the Virtual Classroom Platform possess a moderate impact, represented by a standardized coefficient of 0.207. Proficient planning of virtual classroom activities contributes moderately to students' attitudes towards learning. Collaboration within the Digital Teacher's Competence shows a relatively weaker

influence, with a standardized coefficient of 0.027. Collaborative efforts among teachers have a limited impact on influencing students' attitudes towards learning.

In all, the ranking underscores that both aspects of the Virtual Classroom Platform which are Directing and Organizing have the most significant relative influence on students' attitudes towards learning during the COVID-19 Era in Lagos State. This is followed by Communication and Commitment within the Digital Teacher's Competence. Planning skills within the Virtual Classroom Platform hold a moderate impact, while Collaboration skills within the Digital Teacher's Competence exhibit a relatively weaker influence.

H₀₃: There will be no significant gender difference in school students' attitudes toward learning in the COVID-19 Era in Lagos State.

Table 4.3.2.6 Summary of T-test showing gender difference in school students' attitudes toward learning in the COVID-19 Era in Lagos State

Group Statistics				
Gender	N	Mean	Std. Deviation	Std. Error Mean
Student Male	449	82.4543	7.99879	.37749

attitude towards learning	Female	486	82.2222	8.24996	.37423
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Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Student attitude towards learning	Equal variances assumed	3.042	.081	.436	933	.663	.23212	.53220	-.81232	1.27656
	Equal variances not assumed			.437	930.822	.662	.23212	.53155	-.81105	1.27529

The hypothesis H03, which asserts that there will be no significant gender difference in school students' attitudes toward learning during the COVID-19 Era in Lagos State, was tested using a t-test. The results are summarized in table 4.37: The group statistics reveal the following information for each gender group: For Male students (N = 449), the mean attitude score towards learning was 82.4543, with a standard deviation of 7.99879 and a standard error mean of 0.37749. For Female students (N = 486), the mean attitude score towards learning was 82.2222, with a standard deviation of 8.24996 and a standard error mean of 0.37423. The independent samples t-test was conducted to determine if there is a significant gender difference in students' attitudes toward learning during the COVID-19 Era in Lagos State. Levene's test for equality of variances was performed to assess the assumption of equal variances. Based on the results: When equal variances were assumed, Levene's test yielded an F value of 3.042 with a significance level of 0.081, which suggests that the assumption of equal variances was not met. The t-test for equality of

means with equal variances not assumed resulted in a t value of 0.437 and a corresponding degree of freedom of 930.822. The significance value was 0.662. The mean difference between male and female students' attitudes toward learning was 0.23212, with a standard error difference of 0.53155. The 95% confidence interval of the difference ranged from -0.81105 to 1.27529. In conclusion, the t-test results do not show a significant gender difference in school students' attitudes toward learning during the COVID-19 Era in Lagos State, as the significance value (p-value) exceeds the common threshold of 0.05, therefore the hypothesis was accepted at 0.05 level of significance.

H₀₄: There will be no significant school type difference in digital teacher's competence in secondary school students in Lagos State

Table 4.3.2.7 Summary of T-test showing school type difference in digital teacher's competence in secondary school in the COVID-19 Era in Lagos State

Group Statistics					
School Type		N	Mean	Std. Deviation	Std. Error Mean
Digital Teachers Competence	Public	295	27.4746	2.32522	.13538
	Private	640	28.8141	4.58699	.18132

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
				F	Sig.	T	Df	Sig. (2- tailed)	Mean Difference		
		Lower	Upper								
Digital Teachers Competence	Equal variances assumed	23.138	.000	4.742	933	.000	1.33949	.28249	1.89388	.78509	
	Equal variances not assumed			5.920	925.138	.000	1.33949	.22628	1.78357	.89540	

The test of hypothesis H_{04} , which posits that there will be no significant school type difference in digital teacher's competence among secondary school students in Lagos State, was tested using a t-test. The results are summarized in Table 4.38: The group statistics present the following details for each school type: For Public schools ($N = 295$), the mean digital teacher's competence score was 27.4746, with a standard deviation of 2.32522 and a standard error mean of 0.13538. For Private schools ($N = 640$), the mean digital teacher's competence score was 28.8141, with a standard deviation of 4.58699 and a standard error mean of 0.18132. An independent samples t-test was conducted to investigate whether there exists a significant school type difference in digital teacher's competence among secondary school students in Lagos State. Levene's test for equality of variances was used to assess the assumption of equal variances.

The outcomes of the analysis are as follows: Levene's test with equal variances assumed yielded an F value of 23.138, with a p-value of 0.000, indicating that the assumption of equal variances was violated. The t-test for equality of means, with equal variances not assumed, produced a t value of 4.742 and degrees of freedom of 933. The significance value (p-value) was 0.000. The mean difference in digital teacher's competence between public and private school students was 1.33949, with a standard error difference of 0.22628. The 95% confidence interval of the difference ranged from -1.78357 to -0.89540. In conclusion, the t-test results demonstrate a significant school type difference in digital teacher's competence among secondary school students in Lagos State. The significance level (p-value) is well below the commonly accepted threshold of 0.05, indicating that the observed difference is statistically significant. Therefore, the null hypothesis was accepted.

4.3.3 Analysis of Qualitative Findings

The followings were the responses on the interview conducted with 120 school principals in the six educational districts in Lagos State on virtual classroom teaching and learning process during the COVID-19 Era in Lagos State.

Question (1)

What are the virtual classroom platforms used by teachers for teaching and learning in Lagos state schools during COVID-19

D1PU1

Respondent:

Basically, we used Telegram and WhatsApp. The students also used Radio and Television introduced by Lagos State Government to teach the students

D1PU2

Respondent:

Good afternoon. During the COVID- 19 Lockdown, we used platforms WhatsApp, Telegram, Students were directed to join the Radio and Television organized by Lagos state government.

DIPU 3

Respondent:

Although the Lagos Government gave students Radio for use. The students also used WhatsApp because it is believed that it is cheaper in terms of the data the WhatsApp will consume less data

DIPU4

Respondent:

Lagos as a center of Excellence, introduced different platforms to keep the students going during the Lockdown. Our school keyed into the use of Radio and Television introduced by the state Government. WhatsApp groups were also created on class bases and used by our teachers and students

DIPU5

Respondent:

Thank you. We made use of WhatsApp platform and also Television to teach the students online

DIPR1

Respondent:

The school embarked on the use of WhatsApp to teach our students online because it is accessible to our students for the mere fact that their parents can afford to buy Android phones for their wards

DIPR2

Respondent:

It was an unprecedented occurrence. In our school during the Lockdown, we used Goggle meet, Zoom and Learning Management system (LMS)to teach the students online.

DIPR3

Respondent:

The COVID -19 lockdown contributed faster transition towards the new stage of education in Lagos State, the use of online platforms was the tool that saved and implementing digitalization as a beneficial alternative. WhatsApp was used in my school because it was readily available and parents released their Android phones to their children

DIPR4

Respondent:

During the COVID-19 Lockdown, which took the global unaware, WhatsApp was used by teachers in our school to teach the students because it does not consume much data.

D1PR5

Respondent:

The COVID-19 disrupted teaching globally, to minimize the impact of lockdown, we used WhatsApp to teach our students. We also advised them to join the Radio and Television program introduced by the Lagos State government

D2PU1

Respondent:

Due to the social economic peculiarity of the school, we opted for LTV 8 and WhatsApp. Different WhatsApp groups were created based on their classes

D2PU2

Respondent:

We use zoom and WhatsApp for the online teaching. Students were also advised to join the Radio and Television

D2PU3

Respondent:

We used the E- learning facilitated by Lagos State through Radio, Television. We used WhatsApp and Telegram too to teach the students online

D2PU4

Respondent:

We started with WhatsApp and later used Telegram which we enjoyed better. Students also joined the Radio and Television introduced by the Lagos state Government

D2PU5:

Three different virtual platforms were used, WhatsApp, Radio and Television for the teaching and learning

D2PR1

Respondent:

There different platforms used in our school during the lockdown. These include Edmund, WhatsApp, Radio Television and Telegram

D2PR2

Respondent:

Majorly, we used WhatsApp and Zoom. Teachers were trained on how to teach the students. We also joined the Radio and Television program introduced by the Lagos State Government

D2PR3

Respondent:

COVID-19 came as a thief in the night. It, took the whole world by surprised and unprepared event. In our school, we used WhatsApp and Television station

D2PR4

Respondent:

COVID-19 brought a temporal halt to academic's activities. E- learning medium took over education space. In my school we used WhatsApp and Television program to impact knowledge on the students

D2PR5

Respondent:

Thank you, we use WhatsApp, Radio and Television

D3PUI

Respondent:

School closures due to COVID-19 brought significant disruptions to education across the globe. Lagos state government implemented measures to support the teaching and learning via television and Radio. Our school introduced the WhatsApp for teaching and learning where students were grouped according to their classes

D3PU2

Respondent:

Virtual platforms teaching changed all components of teaching and learning in secondary schools. During the lockdown. WhatsApp and Television introduced by the state government were used.

D3PU3

Respondent:

Globally, everything stopped during COVID-19 lockdown, however students had the opportunity to continue their education through virtual classroom teaching. The virtual platforms used by students in my school include WhatsApp, Radio, Television and Telegram.

D3PU4

Respondent:

Lagos State government like other states of the federation, began the use of broadcasting corporations to connect students and teachers in secondary schools. Core subjects are being taught and transmitted via television and radio stations. Our school keyed into it and also used WhatsApp

D3PU4

You welcome. Today education has changed dramatically with the rise of the use of e-learning due to the COVID -19 lockdown. The Lagos State government introduced the use of Radio and Television for teaching and learning during the lockdown, however in our school we also used WhatsApp along with the Radio and Television program.

D3PU5

Respondent:

During the COVID -19 lockdown, different platforms were used for teaching and learning such as Telegram, Radio, Television, Zoom and WhatsApp. In my school, we used WhatsApp, Radio and Television

D3PR1

Respondent:

Good morning. During the lockdown, the virtual classroom platform used in my school was WhatsApp.

D3PR2

Respondent:

My teachers and my students used Telegram and WhatsApp for teaching and learning.

D3PR3

Respondent:

The COVID-19 brought a significant surge in the usage of digital technology. Different platforms were used in imparting knowledge, we used WhatsApp and Telegram

D3PR4

Respondent:

Following the lockdown in which students were kept home for long due to the COVID-19 pandemic, we resulted to the use of WhatsApp to teach the students so as not to lack behind in their academics

D3PR5

Respondent:

The school used Zoom, Telegram and WhatsApp to teach the students online.

D4PU1

Respondent:

Good morning. The COVID-19 pandemic had a major impact on education which made learning method to go virtual. We used WhatsApp, Radio and Television program.

D4PU2

Respondent:

COVID-19 lockdown forced teachers and administrators to quickly respond to an unexpected and forced transition from face- to- face to virtual teaching. The school used WhatsApp, and Radio.

D4PU3

Respondent:

Different virtual platforms were used to teach the students. Platforms such as Telegram, Goggle meet, Zoom, Edmund, Radio, Television, WhatsApp. In our school we used WhatsApp.

D4PU4

Respondent:

In line with the Lagos state government directives to use Radio and Television, we also used WhatsApp. Students were grouped on class basis.

D4PU5

Respondent:

The virtual platforms used in my school are Radio, Television and WhatsApp.

D4PR1

Respondent:

We used Zoom, google classroom and Microsoft team.

D4PR2

Respondent:

The school used WhatsApp to impact knowledge on the students

D4PR3

Respondent:

We used Zoom and WhatsApp and took advantage of Lagos State Radio and Television.

D4PR4

Respondent:

Thank you. During COVID -19, we used Zoom and Microsoft team.

D4PR5

Respondent:

During COVID-19, the school used Zoom, Telegram and WhatsApp.

D5PU1

Respondent:

Actually, what we used was the WhatsApp group. We linked all students and teaching were passed to them during the period of COVID-19 pandemic was ravaging. School registers were used to divide the students into group

D5PU2

Respondent

At my former school, we had a lot of platforms generally. Teachers also created WhatsApp subjects' group. We also used Zoom restricted to SS3 students, but majority complained of data. The state government created a Radio and Television classes and we were directed that students should join. Subjects like Mathematics, English. Biology and Civic education were taught at stipulated time

D5PU3

Respondent:

The lockdown during COVID-19, was a shocking period in education. Lagos state government introduced the use of Radio and Television for learning. Earlier before this time, school principals were directed to create WhatsApp groups.

D5PU4

Respondent:

COVID-19 lockdown was a great period that exposed us to another way of teaching, classrooms were shut down, however the Lagos state government introduced the use of learning

known as virtual teaching students were grouped based on their classes. The virtual classroom platform used was WhatsApp

D5PU5

Respondent:

You are welcome, its nice meeting you. Virtual classroom teaching was a new norm in schools. In our school, we used WhatsApp for teaching and learning.

D5PRI

Respondent

WhatsApp was used due to the fact that majority of the learners had Android phones so that learn could continue at that time.

D5PR2

Respondent

Mainly we used WhatsApp, because the COVID -19 lockdown came sudden.

D5PR3

Respondent:

COVID-19 lockdown was a difficult problem because of the new methods of teaching introduced. We tried Zoom, but due to the cost of data consumption, teachers were directed to switched to WhatsApp

D5PR4

Respondent:

The one we used to be WhatsApp because we were limited in terms of the students we had at that time.

D5PR5

Respondent:

The COVID-19 lockdown came un- announced which affected all facet of lives. Although so many platforms were used, but in my school, we used WhatsApp.

D6PU1

Respondent:

Virtual platforms have opened up new avenues to teaching and learning. Access to them makes learning more interactive and interesting which has tremendously and students have been more

exited. Here in my school despite that there are different platforms such as Zoom, YouTube, google meet, Radio, Television, WhatsApp, Telegram. We used WhatsApp, Radio and Television

D6PU2

Respondent:

Good afternoon, you welcome to our great school. Some schools used Zoom, WhatsApp, audio, YouTube to download information. We used WhatsApp, Radio and Television as directed by the Lagos state government

D6PU2

Respondent

During the COVID-19 lockdown that students were at home, teaching by media (Television) was introduced. Teachers were directed to create WhatsApp group. We used WhatsApp. Platform

D6PU3

Respondent:

WhatsApp, Radio and Television were used by teachers to teach the students during the COVID-19 lockdown.

D6PU4

Respondent

Virtual platforms available for use during the lockdown for teaching and learning in my school were Radio, Television and WhatsApp.

D6PU5

Respondent:

2020 was not a good year for students and teachers most especially in Nigeria. it was indeed a great threat to education. Government and school administrators were forced to look outside to ensure students continue learning. We engaged in remote learning via WhatsApp because the government formed various platforms for students to augment learning during lockdown. We also had Radio and Television online classes

D6PR1

Respondent:

We used Zoom, Google meet and Microsoft team to teach the students online

D6PR2

Respondent:

During the COVID-19 lockdown, our school used WhatsApp and Telegram.

D6PR3

Respondent:

COVID-19 lockdown transformed the way we do just about everything which brought about the sudden shift to online learning in education. We used WhatsApp mainly in my school.

D6PR4

Respondent:

My school used WhatsApp, Zoom and also took the advantage and advised our students to join the Radio and Television program introduced by Lagos state government.

D6PR5

Respondent:

Morning ma, the lockdown was not really a thing we prepared for. The school adjusted by using WhatsApp to teach the students so that they will not be lying idle at home.

D= District (1 -6) Pu= Public School, PR= Private school

Question 2

What are the most commonly used virtual classroom platforms for teaching and learning in Lagos State during COVID-19 lockdown?

Respondents:

D1PU1- We used WhatsApp and Radio for teaching and learning

D1PU2: We used only WhatsApp in our school.

D1PU3: The teachers used WhatsApp and students also participated in Radio and Television program

D1PU4: The students used Radio, Television and WhatsApp

D1PU5: WhatsApp was mostly used to teach the students online

D1PR1: The school used Zoom because it was more interactive and more engaging

D1PR2: We used WhatsApp and Zoom.

D1PR3: The school only used WhatsApp to impart knowledge to the students

D1PR4: We initially used WhatsApp but due to its clumsiness, we changed to Zoom

D1PR5: We only used WhatsApp to teach students online

D2PU1: The only platform used was WhatsApp.

D2PU2: WhatsApp was the most frequently used platform.

D2PU3: The very popular one used was WhatsApp.

D2PU4: WhatsApp was the most frequently used because it consumes less data.

D2PU5: WhatsApp and Radio were used.

D2PR1: Zoom platform was the most frequently used.

D2PR2: The most frequently used is goggle classroom.

D2PR3: WhatsApp platform was used.

D2PR4: WhatsApp was generally used.

D2PR5: Zoom was used.

D3PU1: WhatsApp was the most frequently use virtual platform

D3PU2: The most frequently used was WhatsApp

D3PU3: We made use of WhatsApp platform

D3PU4: We used WhatsApp and Zoom.

D3PU5: WhatsApp was used.

D3PR1: The most frequently used was WhatsApp.

D3PR2: WhatsApp was the most commonly used virtual platform.

D3PR3: Zoom and WhatsApp.

D3PR4: Only WhatsApp.

D3PR5: WhatsApp and Zoom

D3PU1: We used WhatsApp for teaching and learning.

D4PU2: My school used WhatsApp.

D4PU3: The school used WhatsApp mostly.

D4PU4: WhatsApp was the most frequently used

D4PU5: *Only WhatsApp.*

D4PR1: *Zoom was used for teaching and learning during COVID-19 lockdown.*

D4PR2: *The school used WhatsApp and Telegram*

D4PR3: *Our school used WhatsApp due to affordability of data*

D4PR4: *WhatsApp*

D4PR3: *WhatsApp was the most frequently used.*

D4PR5: *My school used WhatsApp*

D5PU1: *The most frequently used virtual platform used was WhatsApp.*

D5PU2: *WhatsApp was the most commonly used.*

D5PU3: *We used WhatsApp mostly, however some students joined the Radio and Television Program.*

D5PU4: *The teachers used WhatsApp to teach the students.*

D5PU5: *WhatsApp was the only platform used.*

D5PR1: *We used WhatsApp and Telegram.*

D5PR2: *WhatsApp was the mostly virtual platform used.*

D5PR3: *WhatsApp and zoom were used.*

D5PR4: *WhatsApp and Telegram.*

D5PR5: *The school used WhatsApp majorly.*

D6PU1: *WhatsApp was the mostly commonly used*

D6PU2: *The platform used in my school to teach the students was WhatsApp.*

D6PU3: *WhatsApp was used by teachers and students*

D6PU4: *WhatsApp was the most frequently used*

D6PU5: *Mainly, we used WhatsApp*

D6PR1: *Zoom and WhatsApp*

D6PR2: *Goggle meet and WhatsApp*

D6PR2: *WhatsApp*

D6PR3: *Zoom and WhatsApp*

D6PR4: *Our school used WhatsApp and Zoom*

D6PR5: *WhatsApp*

Question 3: *What are some of the challenges faced by teachers in using virtual classroom platforms to teach the students in Covid-19 lockdown?*

DIPU1:

Respondents:

The teachers faced numerous challenges probably because it was a new order. Some of the teachers are not real literate in using internet devices, students not having Android phone as a result many missed classes.

DIPU2:

It is a general thing everywhere, network and most especially purchase of data by parents, erratic power supply and teachers could not walk around to supervise the students

DIPU3

Considering the school environment where not all the parents are literate, they could not afford buying Android phone, most of their wards could not partake in the learning process, students not be punctual, sending nasty emojis reactions that were not relevant to the purpose of creating the group

DIPU4

You know, the use of virtual platforms was strange to the students, both teachers and students were learning how to use it, although there was an in- house- training for teachers. I was fortunate to present the pedagogy of teaching Mathematics in the 21st century at TESCOM level which covers about 500 selected teachers. I later introduced to students how to use Apps to solve problem in Mathematics. As I was teaching then, I was also learning.

DIPU5

The major challenge was availability of data, abuse of the platform by the students although we curtailed it and brought decorum to the platform, power supply, non- availability of Android phones from the students.

DIPR1

Students not concentrating, they put on their devices, however they were busy watching videos or chatting with other students when classes were ongoing, other challenges are noisy background, non- availability of data for students to join online.

DIPR2

Challenges bothered around Network, no power to charge their phones and other devices, some students said they do not have money to buy data.

DIPR3:

Non – availability of digital devices by the teachers and students, network also hindered the teaching process, most classes were later rescheduled

DIPR4:

Some students lacked the devices and internet access to be able to participate on virtual classroom learning. This leaves many students in a bad spot where they are unable to receive an education. Students complained that the workload is much that was the reason why some are not punctual while classes are going on

DIPR5:

Lateness in joining classes, network issue, teachers not well equipped and not versatile, it was indeed an impediment to the success of using virtual classroom platforms electricity and no cash to fuel their generator

D2PU1:

The challenges teachers faced were; distraction or an unexpected noise background from family member, friends and pets that diverted students' attention and participation during virtual teaching, parents were contacted to provide a conducive environment for their wards to allow them to be focused when classes were ongoing, students do not have access to Android phones, no data and poor power supply.

D2PU2:

The challenges are numerous. Students not having Android phone, lateness to join class, no network, epileptic power supply, students not punctual class, not immediately adjusting to the new norm

D2PU3:

Non- availability of data as a result of financial crises during that period, Android phones not available from the students, and no network.

D2PU4:

The challenges encountered by the teachers were that students do not have Android phones; parents were appealed to release their phones to their wards, but majority of them were always at work, so we shifted our classes to evening time.

D2PU5:

Topmost of the challenges was electricity, inability to monitor students' participation and lack of face-to-face teaching and lack of enough training and tools by the teachers.

D2PR1:

Teachers complained about data, although the parents' teachers association (PTA) assisted in the purchase of data for them and also not all the students and teachers have the gadgets to enable them to learn and teach online.

D2PR2:

Students not punctual on line, power not stable, students giving various reasons for not attending classes, teachers lack of technical- know- how, failure on the part of teachers to quickly adapt to changes.

D2PR3:

Lack of parental guidance to monitor students while on online, lack of preparation, inadequate digital tools and support from parents, and distraction from the environment.

D2PR4:

Parents failed to release their phones, erratic power supply, connectivity was also another problem, some students do not see virtual teaching as a serious thing and so they were not participating very well while teaching was going on.

D2PR5:

Challenges encountered are numerous but the most common ones are non- availability of Android phones by the students made students not to be available for virtual teaching students. Where phones are available, there is no data to connect the internets

D3PU1:

We had a lot of challenges network, purchasing data and not many students had Android phone

D3PU2:

Students do not have phone of theirs, it is when their parents are back home that students can participate in the online learning. There was also the problem of not having data to connect the internet. students also played prank by been present in class but involved in other things behind the scene.

D3PU3:

Lack of face- to- face interaction was also one of the challenges teachers encountered, to maintain discipline was a battle they fought with the student, there was also the problem of no data, no network.

D3PU4:

Power supply issues, non-availability of Android phone, Network and lack of communication and one- on- one contact with the students.

D3PU5:

Anything new will surely have its own challenges These include no data on the part of the students, no access to Android phone, network problem, students' participation very low.

D3PR1:

Some students sent irrelevant messages why learning was going on, lack of support from parents who are not literate, inability of parents to purchase data due to their economic status, erratic power supply.

D3PR2:

There was little preparation on the part of the teachers, some students had no reliable internet access, poor internet connection quality and inadequate technical support are some barriers teachers faced while using virtual classroom platforms.

D3PR3: Personal attention is also one of the challenges, students wanted two- way interaction which is not possible in many cases, some topics in the curriculum are theoretical and does not let students practice and learn effectively. Students were not sufficiently prepared for virtual teaching due to lack of devices

D4PR4:

Teachers faced a lot of challenges in teaching the students with virtual platforms. There was a low- level preparedness on the part of teachers and students. It was a challenge for teachers to engage students and make them participate in the teaching- learning process. It was a challenge for teachers to move from offline mode to online mode, changing their teaching methodologies, and managing their time.

D4PR5:

The experience was terrific and quite challenging, another issue we had was that of poor network, most times network was bad, some students did not have access to the Internet and could not afford the services. Most teachers do not know how to protect their devices making them open to cyber-attacks

D5PU1:

Difficulty in assembling all the students for the class, lack of cooperation from the parents, lack of internet facilities, lack of technological expertise from teachers and training in online mode of teaching and their believe in the traditional methods of teaching.

D5PU2:

Teachers faced some challenges in teaching with virtual classroom platforms. It was strange to many because of the technicality involved, some students find it difficult to grasp the online teaching, lack of infrastructure like smartphone, laptops and Internet connection needed to access the platforms

D5PU3:

Some teachers initially felt that traditional method of teaching is a better method of effective teaching, others, lack of technical issues such as electricity, and network, teachers also believed that using virtual platforms are challenging and they do not have emotional attachment with the students

D5PU4:

The challenges include; students finding it difficult to understand instructional goals, not well prepared for classes, lack of parental guidance most especially for working class parents, assessing the students was also another challenge.

D5PU5:

Teachers complained of not feeling connected to their students through the virtual classroom platforms because it is teacher centered most especially with the use of WhatsApp and Telegram. Inaccessibility of virtual learning platforms by the students.

D5PR1:

Infrastructural challenges which include; data cost, poor internet quality, poor electricity and limited or no access to internet for students in the rural areas were some of the challenges faced by teachers in using virtual classroom platforms

D5PR2:

The use of using virtual platforms to teach in our schools was a new norm during the COVID-19 lockdown. Teachers were faced with the tasks of teaching the students such as non- familiarity with few of the platforms, no room for thorough assessment, low students' response.

D5PR3:

The challenges of virtual teaching by teachers include: low students' responsiveness, lack of interpersonal relationship between students and teachers, internet costs and electricity supply

D5PR4:

Students were distracted, feedback from the students were poor; insufficient funds, data and electricity to access learning materials always, lack of organization structure also posed another challenge for the use of virtual platforms to teach the students.

D5PR5:

At times there were no electricity to access learning programs at the time of airing which made some students to miss classes, learning program sometime it was too fast for students to comprehend, distraction from family members.

D6PU1:

Executing topics that are of practical's was a difficult task to teach the students, scheduling enough time for each subject was also challenging due to insufficient data and network problems.

D6PU2:

My teachers faced challenges for the mere fact that teaching online was a new occurrence. Challenges such as; network failure to access learning programs, sometimes, network slow and data gets exhausted and lack of face-to-face interactions.

D6PU3:

Parents inability to support wards during the pandemic was as a result of the cost of digital devices. Students from poorer households experience these challenges relating to affordability of learnt through the platforms because they had less access to internet connectivity, devices, power supply among others.

D6PU4:

Teachers felt that they were not connected to the students through virtual platforms. Students were not actively engaged with the learning platforms and not getting immediate feedback from the students, electricity supply.

D6PU4:

Access to internet at home was a challenge, lack of technological skills on the part of few teachers, most parents do not have Android phone and the nature of prevailing power supply.

D6PU5:

No access to Android phone, no network, and no data. The massive use of internet globally led to internet problems, poor quality video and audio.

D6PR1:

Parents failed to release their phones to their wards, some students were engaged in other activities not related to school system, teachers not prepared and not good in using virtual platforms.

D6PR2:

Connectivity issue, network, distractions from family members, indiscipline; students appearing and disappearing while class is going on, sleeping, eating while classes were ongoing and not concentrating in what the teacher is doing.

D6PR3:

Interaction not available at the point of teaching, students do not have access to Android phone, some that had, parents denied them, electricity supply, some students not taken the class serious, some students did not understand what the teacher taught them.

D6PR4:

The challenges I can remember for now; students do not have success to virtual teaching due to non-availability of Android phone, some parents denied their wards from using it, electricity, no data.

D6PR5:

Some of the challenges are poor network hindered teaching, classes were sometimes rescheduled, some students failed to respond to assignment given by their teachers, no data issue made some students not to be punctual in class, and abuse of the use of the platforms by the students.

Question 4a&4b:

What are the major rules guiding virtual classroom learning? Are the rules guiding the virtual classroom followed by teachers during COVID-19?

DIPU1:

Attendance was made compulsory, it was well organized, teachers and students were given scheduled timetable to be conversant and get prepared for classes, students were advised to mute themselves, they can only unmute when teachers directed them to do so. There was also a golden rule, teachers were directed to be the last person to leave the after the virtual lesson. Teachers were also advised on the type of words to use during their lessons since the management were part of the teaching process on line. We achieved about 80% because the rules were obeyed by the teachers and the students.

DIPU2:

We used a prepared and scheduled time- table, students were advised to be prepared for their lessons, mute their microphone and attend classes from a quiet place that is free from directions, students were also directed not to send things that are not relevant to the purpose of creating the WhatsApp group.

DIPU3

We set the time for the teachers and the students as to when to come up online, during teaching students were advised to refrain from distractions that could affect their concentration. Students

are to get prepared with necessary working materials such as Android phones, pen and paper; teachers are to show up early enough for their classes to instil punctuality in the students. The rules were not followed 100% because at times most students were not online due to some personal reasons, classes were rescheduled.

DIPU4:

The rules include raising their hands to signifying the students have questions to ask the teachers, no rude comments irrespective of student's response, teachers to prepare their lesson notes before the lesson, students to mute their microphone, they unmute when there was need to raise an issue. Teachers obeyed the rules.

DIPU5:

We set the rules by following the scheduled timetable and the teachers complied.

DIPR1:

All links were sent to general platforms for students to follow up, teachers strictly followed the timetable. Assignments were given to the students, marked and scored. Teachers followed the rules strictly except on few occasions.

DIPR2;

All HODS were part of the group WhatsApp created. Although it was difficult to comply with the rules because of the peculiarity of the situation, we had to appeal to the teachers. Logging in at the right time in order not to miss the classes.

DIPR3:

Students were advised not to send emojis while classes were going on, timetable were given to teacher and students to know when to come up on board. Teachers, took attendance of students, students were given time to make their contributions, teachers marked assignments given to students.

DIPR4:

Students were told that the WhatsApp created was mainly an educative platform, yet some students sent emojis, they were removed from the group for a week to serve as lessons to others. Students are to press the icon when they want to ask questions.

DIPR5;

Students were advised to adhere to timetable in order not to miss classes, no questions to be asked until after the lesson, students were to log in and when they do not concentrate, their parents were involved.

D2PU1:

Hun. They do attendance like: am present” “am available” the teacher will be able to know those that were present, we had timetable used by students and teachers, teachers are to prepare

well for the class, we have all the contacts and I monitored the classes. The rules were obeyed by the teachers.

D2PU2:

Teachers were advised to make learning process fun; students are to treat others with respect. students to listen to teachers when teaching, students are not to share irrelevant messages while teaching was going on, students are to respect their teachers and classmates.

D2PU3:

Teachers created awareness of say “hi”, students to mute their phones, ask questions at the end of the lesson, signify by raising up their finger. 90% adhere strictly to the rules

D2PU4:

The rules include been punctual although it was a challenge due to non- availability of Android phone from parents who had gone to work, assignments were given and marked, messages that distract students’ attention are not to be sent by them.

D2PU5:

Time table scheduled, I monitored them with other management team, and also do follow-up. It was effective as teachers and students were engaged in the learning process. The teacher introduces himself that he/she was online. The rules were obeyed.

D2PR1:

Management staff were on the administrator of the group to monitor both the teachers and the students, timetable was schedule for the teachers and students also, students were directed to respect their classmate and should desist from using foul language, they are not to share messages that are not relevant to the purpose of creating the group which was mainly for academics.

D2PR2:

I was the general administrator of the WhatsApp group created, teachers were advised to prepare adequately their lesson, teachers to make sure they are ahead of the students before their classes started to give room for the teachers to be able to take attendance. Part of the rules to the students are that; they mute their microphone while teaching is going on and also be punctual in class. The rules were obeyed like about 80%

D2PR3:

As the school head, monitoring the teachers and the students to make teaching online to be effective, there were code of conduct such as; using the scheduled timetable, teachers are to engage them by making the lesson interesting, teachers are to teach, rehearse and reinforce students.

D2PR3:

The rules used by teachers and students include directing teachers and students to get prepared, students to get a quiet place that is free from distractions, students are to have all needed things for the lesson such as Android phone, phones to be well charged and have enough data to be able to participate in the online classes, students are to mute their microphone when classes are going on.

D2PR4:

Part of the rules for the virtual classroom teaching are that students and teachers to comply with the scheduled timetable, there should be no distraction of any form, students are to mute their phone while lesson was on, ask teachers for help where necessary, raise their hands when they want to speak. The rules were obeyed.

D2PR5:

Students were asked to dress properly most especially when using Zoom platform to teach online, they are to be attentive, mute microphone when they log in, however they can unmute when they have questions to ask, they are to turn on their camera on to see each other. The school used a scheduled time table to teach, teacher was to prepare well for the lesson and also have class control on the students.

D3PU1:

In my school, there are some rules set to monitor the teachers and the students for teaching online to be effective. We have a structured time table that teachers and students used and complied with, teachers were advised to prepare very well for their classes, they are to make teaching online fun to catch the students well. Students are to be punctual and respect their classmate's opinion, mute their phone while classes were going on. All these rules were complied with because the principal was involved in the WhatsApp group created.

D3PU2:

Teachers were advised to make learning engaging to makes learning interesting, a schedule that works for everyone was given to teachers and students, they are to allow students to ask questions, adequate planning and the basic technical knowledge to be put in place, time management, they are to show passion and assist students where necessary.

D3PU3:

With the assistance of parents, they were advised to provide a quiet place devoid of distractions for their wards, students are to mute their phone and be punctual in their classes, they are to get ready the necessary materials to use for the virtual learning such as Android, jotting notes and pen phone and to make sure they are well charged, teachers are to prepare well for the lesson to make them enjoying using online platforms. To some extent, the rules were followed.

D3PU4:

The rule included using scheduled timetable, when students and teachers come online, students, are to mute their phone except when they are directed to unmute their phone, respect their classmate and be careful of their doings. Teachers were directed to get prepared for their lessons, discipline their students where necessary and also caution wayward ones. Teachers obeyed the rules

D3PU5:

Teachers are to organize the class by coordinating the class activities, teachers to be punctual and should always to be in the class before the students, he was in charge of marking attendance, mute their phone, they are to unmute their phone when they want to ask questions, the teacher is to monitor students' activities by asking question with student's name mentioned to know if they were online. The rules were obeyed.

D3PR1:

There were rules set by the school authority concerning the use of virtual platform in teaching our students. Students are directed to mute their phone when learning was going on, they are to respect their classmate, comply with scheduled timetable, be punctual during the virtual teaching, they are not to send messages that are not relevant to the purpose of creating the virtual platforms. Teachers are to obey the time table, to always be ahead of students before the commencement of the virtual teaching, plan adequately for the class and make the teaching interesting. The rules were obeyed

D3PR2:

Teachers are to obey the school timetable so also the students., teachers are to develop creative initiatives that can assist students to overcome limitations of virtual teaching, user - friendly tools that will make teaching interactive. Students are to mute their smartphones when teacher was teaching, they can only unmute when teacher directed the to do so. Teachers complied with the rules because they knew their job was at stake.

D3PR3:

Students were advised to avoid distractions background to allow for full concentration, raise their hands or use icon for permission to speak, they are to mute themselves except when they have the floor, teachers are to guide and encourage the students and students were to pay

attention to the teachers'. Teachers and students are to obey the timetable. Teachers were monitored and rules obeyed.

D3PR4:

When there are no rules, effective learning might not really take place. In our school, rules were set for teachers and students, we used a planned timetable during that period, teachers are to control disruption, students were to be polite and punctual, students to mute their phone, parents are notified when students misbehaved. Teachers were to be role models to create a better learning for the students, create good rapport, connect and interact with the students. The rules were obeyed at least to about 80%.

D3PR5:

Rules were made at the beginning of the classroom teaching. Teachers were advised to make the classes engaged for the students., they were to identify students responding to questions been asked so as to monitor the passive students and also to involve everyone in the class, questions that were related to the topics were to be asked by the teachers, assist students where necessary. Time table were also followed.

D4PU1:

As we have rules for students, so we also have for teachers to obey. Students' rules were; to mute their phone except it was their turn to speak, find a quiet place to receive learning to avoid distractions, be punctual and charge their smartphones properly, teachers are to keep class focused and effective. Teacher was to be prepared, get all necessary tools to be used, be punctual so as to be able to take attendance.

D4PU2:

Students were to be punctual not to miss an important aspect of the topic and to avoid distractions, students to mute their phone, raise up their hands or use icon, no negative jokes, warm and positive interactions expected from the teachers, this will make learners to be motivated, confident and ready to be involved in the teaching learning process. To a greater extent the rules were complied with.

D4PU3:

Rules are important in a virtual classroom learning; they assist in reducing distractions and emphasize while it is necessary to obey the rules, raise up students' hands, when necessary, gives rooms for attention without interrupting the lesson, remind students of the rules of virtual teaching helps in cautioning them, assignments are to be completed at stipulated time, be respectful and refrain from making offensive comments. Teachers are to be prepared with necessary tools needed for learning, encourage their students by asking questions, mark their assignment and give them feedback.

D4PU4:

Some of the rules used for virtual classroom learning by the teachers and students were: students raising up their hands when they intend speaking, participate actively, avoid distraction from family and environment, be punctual by showing up at least five minutes to the commencement of the lesson, non-use of unproductive comments. Teachers given the power to remove unruly behaviour without delay. The rules laid down were obey to the letter.

D4PU5:

Part of the rules set by the school for virtual classroom learning; students were to be active members, be respectful, posting negative things or bullying classmates not allowed, no use of vulgar language, complete and forward their assignments to their teachers, abide with the school timetable, minimize background noise and be focused.

D4PR1:

Students were told to respect their teachers and their classmates, they are to mute their phones, and if they have anything to say, they are to raise their hands or used the icon and wait for the teacher to acknowledge them before talking, pay attention on the goals of the lesson, remove distractions by finding a quiet place to listen to the lesson. Teachers were to engage the students by involving them in the lesson and also mark their assignments.

D4PR2:

Students are to obey the school timetable, be punctual in class, submit assignment as at when due, be courteous and polite, they are to ensure that their phone are fully charged, be punctual, reduce sounds in the background, doing other things while classes are going on was not allowed. submit assignments given by the teachers promptly. Adequate planning by teachers made learning to be effective, they were to obey the timetable set by the school.

D4PR3:

In order for a virtual teaching to be educationally effective for students, there are rule to abide with; avoid distraction backgrounds, be respectful and constructive, inappropriate posting should not be displayed, harassment of classmates not entertained. Teachers are to be role models for students to emulate, they are to follow the timetable prepared by the school, involve the students and ask questions to test the level of their understanding. The rules were obeyed.

D4PR4:

Students to be in class and be attentive, respect teachers and classmates. Students who violated the rules were warned to correct their behaviour either by removing the students for a particular period, called the attention of parents to such act or total removal. Teacher was to be punctual, not to leave class early, ask questions from the students and took responsibility for what happened in the class and should have a reliable internet.

D4PR5:

Students were to show respect to their mates, no foul language, be punctual, participate in class and stay focused, pay attention. Teachers were to obey the time table, be punctual, discipline

students where necessary and make learning involving. The rules were not fully obeyed due to lack of face- to- face interaction between teachers and students.

D5PU1:

We had rules that we followed during the virtual classroom learning. All management members were part of the WhatsApp group to know what was going on, we had a scheduled timetable used by the teachers and students, teachers were advised to prepared well for the lesson with the gadgets they were doing to you, to maintain discipline and also make learning to be involving. Students are to respect their teachers and students, participate actively by responding to questions asked by the teachers, they are not to post thing that are not relevant on the platform learning was going on. The rules were obeyed.

D5PU2:

Managing students online was really a herculean task both for the teachers, administrators and even parents, however, we had rules that we used during the use of virtual platforms to teach the students. Students were to be punctual, to get prepared for the lesson with their phone, and writing materials, be focused and no distraction of whatsoever. Teachers were to be online before the students to take attendance, used the school timetable, prepare adequately for the lesson and make the lesson engaging. The rules were obeyed at least about 75%.

D5PU3:

Time table were released to teachers and students to follow, teachers were to be certain to allow them to achieve the goals of the lesson, they were to prepare for the lesson, mark attendance and give assignment to students, management, HOD's and year tutors were part of the WhatsApp group. Students are to be focused, listen to teachers and contribute where necessary. The rules were obeyed partially due to the fact that accessibility to internet was a major problem, thus having a class control the students was a major problem.

D5PU4:

My school involved the parents in some of the rules we created, so that they will be able to guide their wards towards obeying the slated rules. Part of the rules were that; joining the WhatsApp group was a must for all students, they were to be punctual with necessary tools such as Android phone connected to internet, pen and notebooks, they are to respect others online with them, raise hands up when they have questions to ask. The rules were partially obeyed.

D5PU5:

Rules were set for teachers and students. It is compulsory for teachers to administer test after the lesson and marked, this was to give opportunity to the teachers to know if students were following them or not. Rules were followed by the teachers, during the period teachers' salaries were paid then to motivate them.

D5PR1:

Rules were made to be followed by teachers and students they are to be available and punctual, not allowed to send Emojis, they were to submit assignment directly to teachers WhatsApp, students were sometimes exited for a while when they send messages that were not relevant to the topics taught.

D5PR2:

Students were to be punctual, be ready for the class, contribute where necessary, be respectful, raise hands or use icon when intended speaking. Teachers were to follow the timetable, carry the students along while teaching and give assignment.

D5PR3:

The rules set in our school are; that students are to signify when they want to ask question through icon, respect others' views, no rude comments. Teachers are to prepare their lesson notes, and give assignment to students. The rules were not followed 100% sometimes the Zoom classes were rescheduled due to inability of student's presence when classes were going on

D5PR4:

Schools definitely set few rules for teachers and students to obey, this include students and teachers to use the timetable from the school, teachers and students to be punctual at classes, be prepared to receive learning, students to participate in class discussions, discipline themselves. Teachers to relate well with the students to make teaching effective, give assignment and scored them.

D5PR5:

Teachers and students were advised to comport themselves to the new norm, followed the timetable, be prepare for the lessons, get tools that are necessary for the learning too, they are to avoid distractions. The rules were obeyed to certain level.

D6PUI:

There were guidelines rules for our students and teachers during the use of virtual classroom platforms. Considering that classes were online, teachers were advised to communicate in the language the students would understand, they were to assist them where necessary knowing fully that they were new to the use of online teaching., making sure that students make satisfactory academic progress, ensuring students attentiveness. Students are to be ready for classes based on the timetable given to them, active participation and also to do the assignment given to them. The guidelines were fully obeyed.

D6PU2:

Teachers were advised to maintain a calm and confident tone in teaching the students, encourage students to ask questions, mark their attendance to reduce the rate of absenteeism, direct students to mute their phone to avoid distractions. Students to get prepared for the lesson with

their device and all other material needed, to signify through icon if they have questions to ask, follow the timetable, respect their classmates' opinions.

D6PU3:

Teaching and learning in virtual classroom required some rules to follow both by the teacher and the students. Teachers were directed to use engaging styles to impact knowledge on the students. Students are to be punctual in class and to be attentive, ask questions when in doubt.

D6PU4:

Teachers, students and parents were involved in the rules set by the school authority. Students are to be attentive; they are not to be chatting or do other thing while learning was going on. Parents are to support them by supplying the necessary tools, also provide an environment devoured of distractions, and educate themselves to understand the apps and type of activities their ward was involved online.

D6PU5:

Teachers were to ensure that there were no distractions from their own end, adequately prepared for the lesson, take attendance, monitor their attention while learning was going on, keep classes focused and effective, be familiar with the device they want to use. Students were to charge their phone and be able to connect online, they are to be in an environment conducive to attentive virtual studying, be respectful while others are speaking.

D6PR1:

Students were to be online on time, avoid distractions, avail themselves with necessary materials, be attentive, mute their phone, ask relevant questions. Teachers were to use the language students were familiar with, be there and be ready for the students, evaluate students' performance. They obeyed the rules partially.

D6PR2:

Students are to find a private space in their homes to avoid distractions, making sure their devices were connected, abide with the timetable and be punctual, remain focused, ask questions. Teachers to make expectations clearer, for the mere fact that students are new to the online environment, teachers guided them of appropriate behaviors and expectations from them. Use encouraging and positive language, ask questions and communicate with them.

D6PR3:

Teachers were to build relationships with students online by warmly welcoming them to the class, use the school timetable to teach the students, encourage the students, monitor students by regularly with them calling on their names to know if they are still in class, create a human bond with them. Students were to be prepared for the lesson with necessary tools, be attentive and be focused, ask questions when in doubt.

D6PR4:

Students were to respect each other's view, be ready when class starts, be prepare for the lesson, be respectful to your teacher and classmates, exhibit good behaviors and manners, keep microphone mute, be fully present in class, get a quiet place for your lesson to remove distractions. Teachers were to plan very well for their lesson, be in the class before the commencement of the teaching, discipline students where necessary.

D6PR5:

There were rule set by the school during the use of virtual classroom platforms; Students were to submit assignment timely, be courteous and polite, be ready to learn, mute their phone when it was not their turn to speak, listen to the teach attentively, avoid doing things that might disrupt your teachers lesson and classmates' attention, stay focused and be disciplined. Teachers were to be organized, provide feedback, connecting and engaging students, setting clear expectations for the students. The rules were not totally obeyed

Question 5:

What were some of the attitudes exhibited by students during virtual platform teaching?

D1PU1:

They were excited because to most of the students, it was learning with a difference.

D1PU2:

Some were playing truancy, posting things not relevant with the purpose of the group.

D1PU3:

Playing funny, dropping message that are not part of the learning process.

D1PU4:

Lateness, however, they responded positively.

D1PU5:

Not punctual, posting nude photos.

D1PR1:

Lack of concentration and lateness to class.

D1PR2:

Some students were not all punctual due to the fact that they do not have Android phone.

D1PR3:

So many distractions from the environment where they live.

D1PR4:

Some were confident and happy with the online teaching.

D1PR5:

We had active students (serious contributor) and Non- active (Passive)

D2PU1:

Exposed students to social vices.

D2PU2:

Truancy with the teachers, bullying and calling themselves different names.

D2PU3:

Nonchalant attitude towards online teaching.

D2PU4:

Decrease in learning performance when compared to face –to– face classroom learning.

D2PU5:

Students had positive attitudes towards online teaching.

D2PR1:

Distracting the teacher and students by lying in bed and eating while learn was going on most especially when using goggle meet and zoom.

D2PR2:

There was the willingness of students been engaged in virtual classes.

D2PR3:

Absenteeism was a common thing among the students.

D2PR4:

It was a new innovation, most of our students were excited participating on virtual learning.

D2PR5:

Excited, while there was also absenteeism's, turning the WhatsApp group to social interacting platforms with greetings like 'hi babe' "My lovely One".

D3PU1:

Nonchalant attitude due to non-availability of smartphones.

D3PU2:

Interesting and were time conscious of when they have classes.

D3PU3:

Laziness and excitement.

D3PU4:

Committed, lateness and excitement.

D3PU5:

Lateness and using foul language.

D3PR1:

Eager to attend classes, excited.

D3PR2:

Inquisitiveness and excitement.

D3PR3:

Exposed to social vices such as bullying, cultism, and thuggery.

D3PR4:

Students were able to unlock their potentials and were able to navigate uncertainty.

D3PR4:

Some students were optimistic in deriving much learning from the use of virtual classroom platforms for learning.

D3PR5:

Students developed the attitude of acceptance and adapting to change in the learning process.

D4PU1:

They were confident of using virtual platforms for learning

D4PU2:

Missing classes or frequent lateness, not paying attention to teachers' direction.

D4PU3:

Some had the phobia of using device, pessimism, complain about not having data.

D4PU4:

Laziness and not been punctual in class.

D4PU5:

They were positive using virtual platforms for learning.

D4PR1:

Absenteeism, underground noise, and distractions

D4PR2:

Coming late to classes, non-participation which cannot really be monitored by teachers.

D4PR3:

There was excitement, all students were ready to respond, room for them to research more on the assignment given to them by their teachers

D4PR4:

Complacency, making fun of everything, hijack lesson activities leading to distractions distraction.

D4PR5:

Students not committed, responding to assignment were not encouraging.

D5PU1:

Some of were discouraged due to non-availability of Android phones and money to purchase data

D5PU2

Non-participation on the part of the students.

D5PU3:

While some students were interested in the virtual teaching, seeing it as a new mode of teaching, they keyed into it and were confident in using them to connect the world.

D5PU4:

The poor parental background of some parents led to non- accessibility to online teaching. This resulted into frustration and discouragement from the students.

D5PU5:

Attitude on non-participatory from the students due to the fact that the Android phone belongs to their parents who had gone to work as at the time learning was going on.

D5PR1:

Students were elated, you know this was the first time we are experiencing such a thing, sense of belonging to school was developed.

D5PR2:

It gave the students the opportunity of sharing educational activities idea, they were able to share linking of related topics.

D5PR3:

WhatsApp assisted them to get them motivated and interested during the teaching.

D5PR4:

Some of the attitudes exhibited by our students revealed that they that they used the platforms for different motives, easy use, and communicating with other students.

D5PR5:

Using virtual platforms to teach the students instil the habit of been punctual in classes and eagerness to learn new thing most especially through internet.

D6PU1:

Few of the attitudes exhibited by students according to their teachers include being punctual although not in all cases and pursuing hardworking, and eager to learn through internet.

D6PU2:

It developed the idea of creating and sharing knowledge among themselves beyond the four walls of the classrooms.

D6PU3:

The use of virtual platforms by students developed the attitudes such as looking for information, and trying to solve problems related to learning activities which helped in enhancing their learning

D6PU4:

Using virtual platforms for learning also had a negative attitude on some of the students. It exposed them to social devices such as cultism, thuggery, examination fraud etc.

D6PU5:

Truancy was most common among the students and not paying attention while classes were going on.

D6PR1

In the course of using virtual platforms to teach the students, some traits were exhibited by some of the students such as not been committed to learning, truancy, coming to classes at will.

D6PR2:

Students were excited, eager to attend the class, few of them were lazy hiding under flimsy excuses of no network, no data and no Android phone to use

D6PR3:

Absenteeism was the order of the day on few cases, teachers will be on line, however students will not be available for the lesson.

D6PR4:

Students' attitudes were positive to learning, although there were very few that do not.

D6PR5:

Students showed enthusiasm when learning was in place, punctual during classes and participating regularly were some of the attitudes exhibited by students when using virtual platforms to teach students.

4.4 Discussion of Findings

4.4.1 Discussion of Quantitative

Research question one delved into the assessment of the attitudes held by secondary school students in Lagos State towards learning during the COVID-19 Era. This investigation entailed the evaluation of their readiness, self-discipline, and patience in the context of learning during the pandemic. The results of this study unveiled the remarkable adaptability, determination, and dedication displayed by secondary school students in Lagos State as they navigated the challenges of the COVID-19 pandemic. These findings were in line with prior research endeavours that similarly highlighted positive attitudes and resilience among students when faced with online learning. For instance, a study that examined the attitudes of university students toward online learning during the pandemic discovered a positive outlook, resilience, and adaptability, all of which were identified as pivotal for successful virtual teaching and

learning¹. This alignment is also observable in this study's findings regarding students' confidence, adjustment to online learning, and their persistence during lockdown². In a related investigation, the engagement levels of students in virtual classrooms were explored, revealing their dedicated, focus and patience throughout the online learning process³. This evidence further reinforced the results of this study regarding time dedication, focused engagement, and comprehension of new concepts.

Furthermore, an examination of the impact of self-discipline and goal setting on student performance in online courses concurred with this study's findings⁴. The aforementioned study highlighted how students' creation of study plans, avoidance of distractions, and establishment of achievable goals contributed to their success in virtual learning activities⁴. Moreover, a longitudinal study that tracked students over their educational journey discovered that students who maintained a positive attitude and exhibited persistence were more likely to graduate successfully⁵. These findings correlated with the present study's discoveries concerning persistence and positive attitudes in the face of challenges. A comprehensive analysis also identified key factors for online learning success, including confidence, adaptability, self-discipline, and engagement mirroring the dimensions of attitude explored in this study⁶. Similarly, research suggested that online learners frequently demonstrated higher levels of resilience and adaptability due to the unique challenges they encountered, thereby supporting the positive attitudes and resilience observed among students during the COVID-19 Era in this study⁷.

In contrast, a study uncovered the difficulties many students encountered during online learning, such as motivation struggles, distractions, and ineffective time management⁸. This discarded with the current study's focus on confidence, time dedication, and self-discipline. Similarly, a study comparing academic achievements before and during the pandemic noted a decline in learning

outcomes attributed to challenges tied to online learning, contradicting the positive attitudes and adaptability findings of this study⁹. The phenomenon of online learning fatigue, investigated in another study, contributed to decreased engagement and motivation, contrasting with this study's emphasis on engaged participation and positive attitudes in virtual classrooms¹⁰. An investigation into the digital divide among students highlighted unequal access to technology and resources, which impacted online learning experiences discrepancies that were not mirrored in the surveyed students of this study¹¹.

Furthermore, a study emphasized the difficulties students faced in maintaining motivation and achieving goals online, citing a lack of face-to-face interaction and immediate feedback as hindrances, potentially opposing the goal-setting and achievement outcomes found in this study¹². In all, a study explored technology anxiety and its hindrance to adapting to virtual learning environments, a viewpoint contrary to this study's findings on students' familiarity with online learning tools and rules¹³.

The second research question aimed to ascertain the extent of digital competence among teachers in secondary schools during and post the COVID-19 Era in Lagos State. This investigation involved an evaluation of teachers' commitment, collaboration, communication, planning, organizing, and directing capabilities both during and after the lockdown. The outcomes revealed a notably high level of digital competence among teachers, particularly in areas of collaboration, communication, and specific aspects of planning and directing. However, certain elements of planning and organizing indicated areas for potential enhancement. Moreover, the findings suggested an overarching positive attitude and strong dedication among teachers in Lagos State toward integrating digital technology into their teaching practices following the lockdown.

These results were bolstered by findings from related research. For example, a study concentrated on teacher digital competence post the pandemic and found that teachers exhibited commitment to integrating digital tools, effective collaboration, clear communication, and engaging lesson planning, successfully adapting to the new teaching landscape¹⁴. This aligns with the current study's findings regarding commitment, collaboration, communication, and planning of teachers during and after the lockdown. Additionally, an exploration of teacher collaboration's impact on digital learning outcomes emphasized how collaborative efforts led to effective digital tool integration, enhanced communication, and innovative lesson planning, aligning with the present study's results on collaboration, communication, and planning¹⁵. Similarly, a study underlined the significance of teachers' digital pedagogical competence in online teaching, revealing a substantial percentage of teachers displaying commitment, proficient communication, and digital tool proficiency for improved student engagement and learning outcomes¹⁶. These outcomes corresponded with the study's findings regarding commitment, communication, and digital competence among teachers during and post the COVID-19 Era. Likewise, research delved into teachers' perspectives on online assessment strategies, showcasing teachers' planning skills and adept integration of digital tools to maintain student engagement and accurate assessment, mirroring the findings on teacher competence in planning and assessment in this study¹⁷. Similarly, an exploration of strategies for organizing virtual classrooms uncovered that teacher who established clear guidelines, adhered to schedules, and fostered virtual community-building created conducive learning environments, aligning with this study's results on organizing¹⁸.

In contrast, a study highlighted challenges teachers faced in sustaining digital competence post the pandemic, noting difficulties in adapting to new technologies, effective communication, and

student engagement in virtual classrooms¹⁹. This contrasted with the current study's findings on commitment, communication, and engagement. Similarly, research identified obstacles to teacher collaboration in online settings, attributing limited time, technological barriers, and inadequate training as hindrances, differing from the findings on collaboration in this study²⁰. Similarly, challenges in virtual classroom communication were revealed by a study, encompassing issues such as misinterpretation of digital communication and monitoring student progress difficulties, in contrast with the communication findings²¹. Moreover, research discussed challenges in planning virtual lessons, highlighting the complexities of designing engaging virtual lessons, assessing student learning, and communicating expectations for teachers, contrasting with the results on planning in this study²². Additionally, a related study addressed the challenges of organizing digital classrooms, identifying obstacles like maintaining student adherence to schedules, effective breakout room management, and fostering virtual community-building, differing from the organizing results in this study²³. Furthermore, a study examined challenges in directing virtual classrooms, revealing difficulties in setting clear goals, defining student roles, and providing explicit instructions, contrasting with the directing findings in this study²⁴.

Research question three aimed to identify the virtual classroom platforms most frequently employed for teaching secondary school students during and after the COVID-19 Era in Lagos State. The findings indicated that WhatsApp was the predominant virtual learning platform during the COVID-19 lockdown in Lagos State, while Zoom took the lead as the most commonly utilized platform after the lockdown. In comparing and contrasting these findings with other relevant studies, a study focused on WhatsApp's use for remote learning during the pandemic. It revealed WhatsApp's popularity due to its user-friendly interface and widespread accessibility, facilitating communication and resource sharing between educators and students²⁵.

This finding bolstered the present study's results regarding WhatsApp's prominence during the lockdown. Likewise, a study compared Zoom and Google Meet's effectiveness for virtual classrooms and concluded that both platforms enabled efficient real-time interaction, resulting in widespread teacher adoption²⁶. This concurred with the present study's observation of Zoom's popularity.

On the contrary, a study exploring shifts in virtual classroom platform usage after the pandemic reported a decline in platforms like WhatsApp as educators returned to in-person teaching, in contrast to this study's findings²⁷. Additionally, another study highlighted the continued use of radio and television in remote education, emphasizing their significance for reaching underserved regions, differing from the trend observed in your study²⁸. Furthermore, a study examined the adaptability of Google Meet and Zoom post-pandemic in the Nigerian secondary school context and suggested that these platforms might not retain their relevance as schools' transition back to in-person learning indicating a contrast with the findings on Zoom's post-lockdown usage²⁹.

Research question four aimed to uncover the challenges encountered by students in utilizing virtual classroom platforms during the COVID-19 Era in Lagos State. The findings indicated that among various challenges, poor internet services and unreliable power supply stood out as prominent issues faced by students during and after the pandemic. These results were congruent with observations from related research. For instance, a study focused on challenges faced by teachers in developing countries amid the pandemic, highlighting that poor internet connectivity and inconsistent power supply were common barriers impeding effective virtual teaching³⁰. Similarly, another study delved into the impact of the digital divide on education during the pandemic, underscoring how students and educators in underserved regions struggled with

connectivity problems due to inadequate internet access and unreliable power supply³¹. A study conducted in a related geographical location examined the challenges of transitioning to online education and noted that teachers encountered difficulties like power outages and unstable internet connections, leading to disruptions in virtual classes³². The consistent presence of poor internet services and power supply issues across these studies and the present research underscores the significant impact of infrastructural challenges on the effectiveness of virtual learning platforms during the COVID-19 Era.

Research question five aimed to uncover the challenges experienced by teachers when using virtual classroom platforms in Lagos State. The results revealed that, among various challenges, poor internet services and unreliable power supply were particularly prominent during the COVID-19 Era. However, after the pandemic era, irregular power supply and high costs of subscription emerged as more significant issues. These findings were in line with similar observations from other studies. For instance, a study conducted in Lagos State examined the challenges teachers faced during the pandemic and highlighted the detrimental effects of poor internet connectivity and power outages on effective virtual teaching³³. Similarly, research delved into how socioeconomic factors influenced virtual learning, particularly noting how irregular power supply and high subscription costs for internet services disproportionately affected educators in specific areas³⁴. These observations aligned well with the findings after the COVID-19 Era in this study. Moreover, a related study centred on policy recommendations to address digital equity challenges advocated for interventions by governments and institutions to improve internet access and alleviate subscription costs³⁵. This stance corresponded with the findings in both the during and after pandemic eras, emphasizing the ongoing need for addressing infrastructural challenges to support effective virtual teaching.

Research question six aimed to assess the extent of teacher compliance with the regulations guiding virtual teaching during the COVID-19 Era in Lagos State. The outcomes revealed an overarching commitment to adhering to these regulations both in the COVID-19 era and after the pandemic. These findings were consistent with findings from similar research. For example, a study uncovered that teachers displayed strong dedication to following guidelines to ensure effective virtual teaching during and after the COVID-19 Era in Lagos State, Nigeria³⁶. Furthermore, research emphasized the pivotal role of clear and well-communicated guidelines from education authorities in fostering teachers' commitment to adhering to virtual teaching regulations, which aligned with the present study's findings³⁷. Similarly, it was noted in a study that teachers who comprehended the significance of adhering to regulations for enhancing student engagement and learning outcomes exhibited higher levels of compliance, supporting the findings of this study³⁸.

Conversely, another study highlighted instances where teachers faced challenges in adhering to guidelines due to technical difficulties, lack of training, or conflicting expectations, contrasting with the high compliance level identified in your study³⁹. Similarly, a related study identified cases in which teachers deviated from strict guidelines to creatively engage students while still achieving learning outcomes, differing from the present study's results⁴⁰. Moreover, a related study explored the role of teacher autonomy in compliance with virtual teaching regulations, suggesting that teachers who felt empowered to adapt guidelines to their unique classroom contexts exhibited variations in compliance, which contrasted with the uniform compliance found in this study⁴¹.

Research question seven aimed to determine the extent of students' compliance with the rules governing virtual classroom platforms during the COVID-19 Era in Lagos State. The findings

revealed a high level of compliance among students with the regulations guiding virtual classroom platforms both during and after the COVID-19 Era. These results were corroborated by similar research findings. For instance, a study that compared students' compliance with virtual classroom guidelines across various regions found that students consistently adhered to rules and regulations, thereby contributing to effective virtual learning⁴². Similarly, research delved into students' perspectives on adhering to rules in virtual education and highlighted their recognition of the benefits associated with following guidelines, such as heightened engagement and improved learning outcomes. These findings aligned with the present study's results on high student compliance. Likewise, an exploration of factors influencing students' adherence to virtual classroom rules unveiled that clear communication, understanding the significance of rules, and teacher guidance played key roles in fostering students' high compliance rates, in line with the findings of the current study⁴³. However, on the contrary, a study suggested that students grappled with technical difficulties, distractions, or lack of accountability, potentially leading to challenges in compliance, which contrasted with the high compliance levels identified in this study⁴⁴.

Test of hypothesis one was conducted to ascertain the significant combined influence of digital teacher's competence, virtual classroom platform, and student's attitude towards learning during the COVID-19 Era in Lagos State. The results obtained unequivocally demonstrated a profound and significant combined influence of these factors within the context of online education. This finding not only underscores the relevance of these elements but also contributes to a deeper understanding of their interplay. Furthermore, the implications of the current study's findings are buttressed by corroborative evidence from several related studies. For instance, a study examining the significance of collaboration on student attitudes towards learning illuminated the

pivotal role of fostering a positive learning environment through effective collaboration⁴⁵. While this study primarily focused on collaboration in isolation, the current study extends its scope by encompassing not only collaboration itself (represented by teacher competence and virtual platforms) but also the critical dimension of student attitudes towards online learning. By harmonizing these factors, the current study augments the understanding of the intricate interrelationships between collaboration, technological integration, and student outlook. Likewise, an allied study ventured into the effects of integrating digital technology into the virtual classroom and its subsequent impact on student attitudes. The emphasis on the virtual classroom platform and its harmonized influence on student attitudes parallels the present study's findings⁴⁶. In a complementary manner, the current study extends these observations by recognizing that teacher competence, in tandem with the integration of digital technology, serves as pivotal determinants of student attitudes towards learning. This discernment of interconnected components sets the current study apart in terms of its holistic approach.

Additionally, a parallel investigation illuminated the significant role of mobile app usage in facilitating student collaboration, interaction, and consequent learning outcomes⁴⁷. While this study primarily revolved around the role of mobile applications, the current study broadens its horizon by incorporating not only the technological facet (virtual platforms) but also the indispensable factor of teacher competence. By encompassing all three elements, the present study gains a comprehensive grasp of how the symbiosis of technological integration, effective teaching practices, and optimistic student attitudes collectively elevate the efficacy of online learning during the challenging landscape of the pandemic.

Similarly, a study addressing the challenges of e-learning during the pandemic highlighted the obstacles encountered by both students and educators in transitioning to remote education. This

emphasis on the impediments tied to technology access, infrastructure, and skills mirrors the challenges acknowledged in the present study. By comprehensively acknowledging how teacher competence and student attitudes intersect to mitigate or exacerbate these challenges, this study renders a nuanced comprehension of the broader ramifications associated with e-learning hurdles⁴⁸.

In contrast, it is important to recognize that some studies explore the potential negative ramifications of technology overexposure, such as heightened screen time leading to digital fatigue, diminished attention spans, and waning engagement⁴⁹. These studies caution against the excessive utilization of technology, especially for educational purposes, due to its potential to negatively impact student well-being and mental health, consequently influencing their attitudes towards learning. Similarly, related research offers support for the notion that technology acceptance is positive, yet it concurrently underscores instances of resistance to technology adoption among specific cohorts of students or educators⁵⁰. These studies underscore the challenges inherent in adapting to novel technologies and underscore the necessity of adequate training and support mechanisms.

In all, the amalgamation of the current study's focus on the combined influence of teacher competence, virtual platforms, and student attitudes underscores its unique contribution to the existing body of knowledge. While the majority of the provided studies accentuate the affirmative aspects of technological integration and collaboration in the realm of online learning, the educational landscape remains multifaceted. Acknowledging the potential contrasts and limitations within the realm of education and technology ensures a holistic and well-rounded understanding of the intricate dynamics shaping modern education.

The test of hypothesis two aimed to uncover the significant relative influence of digital teachers' competence and virtual classroom platforms on students' attitudes towards learning in the COVID-19 Era within Lagos State. The results of this inquiry yielded a noteworthy finding both during and after the Covid-19 Era, a significant relative influence of digital teachers' competence and virtual classroom platforms on students' attitudes towards learning was discerned. This outcome not only sheds light on the dynamics of online education during the pandemic but also aligns harmoniously with the conclusions drawn from various other empirical studies. One such study, which conducted a comparative analysis of the impact of digital teachers' competence and virtual classroom platforms on students' attitudes towards learning during the COVID-19 Era, shared similar findings⁵¹. Employing a quantitative methodology, this research collected data from a diverse student sample in Lagos State. The ensuing statistical analysis indicated a substantial relative influence of both digital teachers' competence and virtual classroom platforms on students' attitudes towards learning. This influence was particularly pronounced among students who experienced higher levels of digital teachers' competence and more effective virtual classroom environments, leading to more positive attitudes towards their learning experiences⁵¹.

In a comparative reflection upon these findings and the present study, it becomes apparent that both investigations underscore the pivotal roles played by digital teachers' competence and virtual classroom platforms in shaping students' attitudes towards learning amidst the challenges posed by the pandemic. However, a nuanced distinction arises in the scope of focus between the two studies. While the previous study embraced a broader perspective by considering the combined influence of teacher competence, virtual platforms, and student attitudes, the present study zoomed in to examine the relative contributions of teacher competence and virtual

platforms to attitudes. This shift in focus to relative influence adds a valuable dimension, offering insights into the unique roles each factor plays in moulding students' attitudes, thereby complementing the broader canvas of the earlier study.

Another empirical inquiry set out to explore the intertwining roles of digital teachers' competence and virtual classroom platforms in shaping students' attitudes towards learning during and after the COVID-19 Era. Utilizing a mixed-methods approach that combined quantitative surveys with qualitative interviews, this study presented a comprehensive understanding of the subject. The findings brought to the fore a significant impact of both digital teachers' competence and virtual classroom platforms on students' attitudes⁵². The quantitative analysis further unveiled a positive correlation between the level of digital teachers' competence, the effectiveness of virtual platforms, and students' attitudes.

A careful juxtaposition of these findings with the present study reveals a convergence in the emphasis placed on the critical roles played by digital teachers' competence and virtual classroom platforms in influencing students' attitudes towards learning. However, the present study takes a step forward by delving into the distinct contributions of these factors to attitudes. Additionally, the qualitative insights provided by the mixed-methods approach in this study delve deeper into the underlying mechanisms, enriching our comprehension of the intricate relationships within the realm of online learning experiences.

Likewise, in an exploration of the intricate interplay among digital teachers' competence, virtual classroom platforms, student attitudes, and their combined impact on online learning outcomes during the COVID-19 Era, another study employed a mixed-methods approach. By gathering quantitative survey data alongside qualitative interview insights, this research aimed to offer a comprehensive understanding of the factors influencing students' online learning experiences.

The resultant findings unveiled a multi-dimensional relationship among digital teachers' competence, virtual classroom platforms, student attitudes, and learning outcomes⁵³.

Drawing parallels between these outcomes and the present study, a resonance emerges in the recognition of the pivotal roles occupied by digital teachers' competence, virtual classroom platforms, and student attitudes in shaping the landscape of online learning experiences. However, the current study elevates the discourse by exploring how these factors collaboratively impact actual learning achievements. The nuanced perspective achieved by examining the holistic influence of these factors on attitudes enriches our understanding of their implications on the broader canvas of effective online education. The employment of a mixed-methods approach further elevates the depth of analysis, contributing to a more comprehensive comprehension of the intricate relationships at play.

The interconnected nexus of digital teachers' competence, virtual classroom platforms, and student attitudes in shaping effective online education during the COVID-19 Era, a quantitative research design was employed. Data were collected from students in Lagos State, leading to the revelation of intricate relationships among digital teachers' competence, virtual classroom platforms, student attitudes, and online learning outcomes. When these findings are considered alongside the present study, a striking alignment emerges in the highlighting of the significant roles played by digital teachers' competence, virtual classroom platforms, and student attitudes in shaping the landscape of online education during the COVID-19 Era. However, the present study distinguishes itself by delving deeper into the interconnected nature of these factors and their collective impact on effective online education. While the referenced study emphasized the significance of these factors in shaping attitudes, the present research delves further to elucidate how their interrelatedness translates into successful online learning experiences. The adoption of

a quantitative research design ensures the rigor of analysis, with the findings contributing substantially to our holistic comprehension of the intricate dynamics underpinning effective online education.

Test of hypothesis three was conducted to determine the significant gender difference in school students' attitudes toward learning in the COVID-19 Era in Lagos State. The result of the test showed no significant gender difference in school students' attitudes toward learning during the COVID-19 Era in Lagos State, as the significance value (p-value) exceeds the common threshold of 0.05, therefore the hypothesis was accepted at 0.05 level of significance. The outcome of this analysis yielded an intriguing revelation: there was no substantial gender difference detected in school students' attitudes toward learning in the context of the COVID-19 pandemic. This result was based on the observation that the significance value (p-value) obtained from the statistical analysis surpassed the commonly accepted threshold of 0.05. As a result, the hypothesis, positing a significant gender difference, was accepted at the 0.05 level of significance.

To contextualize and enrich this finding, it's valuable to examine it in light of the outcomes from several empirical studies in related domains. One study, which investigated gender differences in students' attitudes toward online learning, aligned with the present finding. This study found no significant gender difference in attitudes toward online learning platforms, highlighting that both male and female students displayed similar attitudes and preferences in this educational context⁵⁴. This parallel finding further underscores the consistency observed in the current study, suggesting that gender may not be a decisive factor influencing attitudes toward learning during the COVID-19 Era.

In another empirical exploration that focused on gender differences in remote learning experiences, no significant disparities were uncovered. The study assessed students' satisfaction,

engagement, and perceived effectiveness of remote learning methods. The results indicated that gender did not play a statistically significant role in shaping these perceptions. This congruence in findings echoes the notion that gender-based variations in attitudes toward learning during the pandemic might be less pronounced than initially presumed⁵⁵. A similar line of inquiry that assessed gender differences in attitudes toward e-learning platforms during the pandemic found no significant variation based on gender. The study delved into students' perceptions of technology's usability, learning outcomes, and overall satisfaction with the e-learning environment. The absence of a significant gender divide in these domains mirrors the lack of a substantial gender difference found in the current study's investigation of students' attitudes toward learning⁵⁶. Furthermore, a study investigating gender differences in online education preferences during the COVID-19 Era highlighted that both male and female students expressed similar preferences for synchronous online learning. This similarity in preferences resonates with the finding that gender did not exert a significant influence on attitudes toward learning in the Lagos State context during the pandemic⁵⁷.

Adding to this body of evidence, another study exploring gender differences in attitudes toward remote education discovered that gender was not a significant predictor of attitudes. The study measured students' perceptions of technological aspects, interaction quality, and overall satisfaction with remote education. The absence of gender-related disparities in these dimensions mirrors the lack of a substantial gender difference in the attitudes of Lagos State students toward learning during the COVID-19 Era⁵⁸.

Collectively, the findings from these diverse empirical studies coalesce to support and reinforce the outcome of the present investigation. The common theme that emerges is that gender differences in attitudes toward learning during the COVID-19 Era appear to be minimal or

negligible. This indicates that other factors, such as instructional strategies, technology access, and individual learning preferences, might have played a more significant role in shaping students' attitudes toward learning in the challenging context of the pandemic. The convergence of these findings underscores the importance of considering multifaceted factors when understanding student attitudes and preferences in the dynamic landscape of remote and online education.

Test of hypothesis four was conducted to determine the significant school type difference in digital teacher's competence in secondary school students in Lagos State. The result obtained showed significant school type difference in digital teacher's competence in secondary school students in Lagos State. Therefore, the null hypothesis was rejected. The investigation carried out in hypothesis four aimed to ascertain whether there existed a substantial difference in digital teacher's competence among secondary school students in Lagos State based on the type of school they attended. The outcome of this analysis yielded a noteworthy finding: a significant difference in digital teacher's competence emerged among secondary school students in Lagos State, with this difference being contingent on the type of school attended by the students. As a result of the statistical analysis, the null hypothesis, which posited no significant school type difference in digital teacher's competence, was rejected.

To enrich the discussion and place this finding within a broader context, it's imperative to draw insights from the outcomes of several relevant empirical studies. One study delved into the disparity in digital teacher's competence between students in public and private schools during the COVID-19 Era. This study revealed that students in private schools tended to perceive their teachers as more digitally competent compared to students in public schools. This aligns with the present finding of significant school type difference, wherein the type of school attended

influenced students' perceptions of their teachers' digital competence⁵⁹. A similar inquiry explored differences in digital teacher's competence across different school types and regions. The study revealed variations in students' perceptions of their teachers' digital skills, with urban schools generally exhibiting higher levels of perceived competence⁶⁰. This variation based on school type parallels the outcome of the current investigation and underscores the significance of considering school characteristics in assessing digital teacher's competence. Furthermore, a study investigating the impact of school type on digital education experiences identified differences in students' perceptions of their teachers' ability to effectively use digital tools. The findings highlighted that the type of school attended could influence students' evaluations of their teachers' digital competence⁶¹. This finding resonates with the present study's result, which points toward a notable school type difference in digital teacher's competence.

Adding to this discourse, another study assessed the factors affecting students' perceptions of their teachers' digital readiness. The research highlighted that the school's technological resources and infrastructure could significantly influence students' perspectives on their teachers' digital competence⁶². This consideration further reinforces the significance of school type in shaping perceptions of digital teacher's competence, as indicated in the current investigation. Moreover, a study examining the role of school type in students' digital learning experiences found that the level of digital competence demonstrated by teachers varied across different types of schools⁶³. This variance was attributed to differences in resources, training, and technology integration. This observation closely aligns with the finding that significant school type differences exist in digital teacher's competence among secondary school students in Lagos State. In sum, the findings from these empirical studies collectively align with the outcome of the current investigation, substantiating the notion of a significant school type difference in digital

teacher's competence among secondary school students in Lagos State. The shared theme across these studies underscores the influence of school characteristics, resources, and infrastructure on students' perceptions of their teachers' digital competence. This insight underscores the importance of considering school-specific factors when designing strategies to enhance digital teacher's competence and effectively integrate technology in education.

4.4.2 Discussion of Qualitative Findings

Question One

What are the virtual classroom platforms used by teachers for teaching and learning in Lagos state schools during COVID- 19?

Summary of Principals Responses

In response to Research Question 1, secondary school principals in Lagos state reported a range of virtual classroom platforms utilized during the COVID-19 pandemic. These platforms were selected based on factors such as accessibility, cost-effectiveness, and government directives. The most frequently mentioned virtual classroom platforms included WhatsApp, Radio, Television, Zoom, Telegram, Google Meet, and Microsoft Teams. Here is a consolidated presentation of the findings:

District 1 (Public Schools): Respondents from District 1 public schools primarily cited the use of WhatsApp, Radio, and Television as key platforms for online teaching. WhatsApp was favoured for its accessibility and data-saving qualities. District 2 (Public Schools): District 2 public schools employed a variety of virtual platforms, including Zoom, WhatsApp, Radio, Television, and Telegram. WhatsApp played a significant role alongside the government's Radio and Television programs. District 3 (Public Schools): Schools in District 3 utilized multiple virtual

platforms, encompassing WhatsApp, Radio, Television, and Telegram. WhatsApp emerged as a common choice for facilitating teaching and learning. District 4 (Public Schools): In District 4, virtual platforms such as WhatsApp, Radio, and Television were adopted for online education. District 5 (Private Schools): Private schools in District 5 predominantly relied on WhatsApp as the primary platform for teaching during the lockdown. This choice was attributed to its widespread availability among students. District 6 (Private Schools): District 6 private schools employed a combination of virtual platforms, including WhatsApp, Radio, Television, Zoom, Google Meet, and Microsoft Teams. WhatsApp remained a popular choice due to its accessibility. In summary, the virtual classroom platforms used in Lagos state schools during COVID-19 included WhatsApp, Radio, Television, Zoom, Telegram, Google Meet, and Microsoft Teams. The selection of these platforms varied based on factors such as accessibility, cost, and compliance with government directives. WhatsApp, in particular, emerged as a widely utilized platform across both public and private schools, with Radio and Television programs introduced by the Lagos state government complementing online education efforts.

The study examining the virtual classroom platforms employed by teachers in Lagos state schools during the COVID-19 pandemic revealed several noteworthy findings. Faced with the unexpected closure of physical classrooms, educators in Lagos state swiftly turned to a diverse array of virtual platforms to ensure the continuity of education. WhatsApp emerged as a common choice among both public and private schools. This preference was primarily due to its accessibility, cost-effectiveness, and data-saving features. Notably, many students and parents had access to Android phones, making WhatsApp a practical and widely accepted choice. The Lagos state government played a pivotal role in facilitating online education during this challenging period. They introduced Radio and Television programs, which were embraced by

numerous schools as an effective means of reaching students through mass media channels. This government initiative underlined the collaborative effort to adapt to the crisis. Teacher training also played a significant role in the successful transition to virtual teaching. Educators received training on how to effectively utilize these platforms to educate their students, highlighting the importance of teacher preparedness in the digital teaching landscape.

However, challenges were not absent. Some respondents expressed concerns about data consumption, particularly with platforms like Zoom. This issue underscored the need to consider data affordability and accessibility when selecting virtual platforms for education. Overall, the findings of this study underscored the resilience and adaptability of Lagos state's education system in the face of an unprecedented global crisis. The use of a variety of virtual platforms, with WhatsApp as a prominent choice, demonstrated the importance of flexibility and creativity in ensuring that education remains accessible during times of crisis. The government's involvement through Radio and Television initiatives further emphasized the collaborative efforts to mitigate the impact of the pandemic on education. This period of upheaval accelerated the adoption of digital technology in education, leaving a lasting impact on the educational landscape in Lagos state.

Research Question Two: What are the most commonly used virtual classroom platforms for teaching and learning in Lagos State during COVID-19 lockdown?

Presentation Responses

Based on the responses of the school principals in Lagos State to the research question about the most commonly used virtual classroom platforms during the COVID-19 lockdown, we can make

the following interpretations: WhatsApp was the most commonly used virtual platform across both public and private schools in Lagos State during the COVID-19 lockdown. This platform was mentioned by nearly all principals from both public and private schools.

Radio and Television programmes were also mentioned, though not as frequently as WhatsApp. It was mentioned that some students participated in Radio and Television programs alongside WhatsApp. Zoom was mentioned by a few principals from both public and private schools as an alternative to WhatsApp. Some schools initially used WhatsApp but switched to Zoom due to perceived advantages.

Google Classroom and Telegram were mentioned but not as frequently as WhatsApp and Zoom. Google Classroom was mentioned only by one respondent from a private school, while Telegram was mentioned by one respondent from a private school. Affordability of data was mentioned as a reason for choosing WhatsApp as the primary platform. While WhatsApp was widely used, it's important to note that its popularity may have been influenced by factors such as ease of access and affordability of data. In all, WhatsApp was the overwhelmingly dominant virtual classroom platform used by both public and private schools in Lagos State during the COVID-19 lockdown, with Zoom as a notable alternative. Radio and Television programs were used in conjunction with virtual platforms in some cases as stated by the school principals.

The most significant and consistent finding is that WhatsApp was the virtual platform of choice for both public and private schools. It was mentioned by virtually all secondary school principals, indicating its widespread adoption for teaching and learning during the lockdown. This could be attributed to its user-friendliness, accessibility on mobile devices, and the fact that many students and teachers were already familiar with the app.

While WhatsApp was the primary tool, some schools also incorporated Radio and Television programmes into their teaching strategies. This suggests that schools explored various means to reach students, recognizing that not all students had access to the internet or smart-phones. This hybrid approach aimed to ensure that educational content reached a broader audience.

Zoom emerged as a notable alternative to WhatsApp, with some schools using it for its perceived advantages, such as interactivity and engagement. The shift from WhatsApp to Zoom by some schools implies that some schools were willing to adapt and experiment with different tools to enhance the quality of online education.

Google Classroom and Telegram were mentioned but to a lesser extent. Google Classroom, in particular, was only mentioned by one principal from a private school. This suggests that while other platforms existed, they were not as prevalent or widely adopted as WhatsApp and Zoom.

The mention of data affordability influencing the choice of WhatsApp highlights a practical consideration. WhatsApp's lower data usage compared to some other platforms may have made it a more accessible option for both students and teachers, particularly in the study area where data costs can be a significant barrier.

Overall, the findings reveal that schools in Lagos State made their platform choices based on a combination of factors, including accessibility, cost-effectiveness, and perceived functionality. This adaptability and willingness to explore multiple tools reflect the resilience of educators and their commitment to providing quality education during challenging circumstances. The widespread use of WhatsApp and the exploration of supplementary tools like Zoom, Radio, and Television demonstrate the agility of educational institutions in Lagos State in responding to the educational challenges posed by the COVID-19 lockdown. These findings highlight the

importance of considering multiple factors, including accessibility and cost, when selecting virtual classroom platforms for effective distance learning.

Question 3: What are some of the challenges faced by teachers in using virtual classroom platforms to teach the students in Covid-19 lockdown?

Presentation Responses

The responses from the school principals provide valuable insights into the challenges faced by teachers when using virtual classroom platforms during the COVID-19 lockdown in Lagos State. During the COVID-19 lockdown in Lagos State, teachers encountered a range of challenges when transitioning to virtual classroom platforms. One prominent issue was the level of digital literacy among educators. Many teachers were unfamiliar with internet devices and had to adapt quickly to this new mode of teaching. This posed a significant hurdle to their ability to effectively deliver lessons online. A critical challenge revolved around student access. Not all students had the necessary devices, such as Android phones or laptops, to participate in virtual classes. This digital divide hindered their engagement in online learning, creating disparities in educational access. Another persistent challenge was network issues, including poor internet connectivity and unstable connections. These problems affected both teachers and students, leading to disruptions in virtual classes and hindering the learning process. The cost of purchasing data for online classes emerged as a significant financial barrier for both teachers and students. This was particularly challenging for those from economically disadvantaged backgrounds, further exacerbating educational inequalities. Erratic power supply added to the difficulties. Frequent power outages disrupted virtual classes, making it challenging for teachers and students to maintain consistent participation and engagement. Some students were not fully engaged in virtual classes, often being distracted by unrelated activities during lessons. This lack

of engagement affected the quality of learning and teaching. Both teachers and students faced challenges due to a lack of preparation and training in using virtual classroom platforms. This steep learning curve impacted the effectiveness of online teaching and learning. The support and guidance of parents were crucial, but not all parents were able to provide a conducive learning environment or assistance with technology. Lack of parental support was especially challenging for students from less technologically literate households. Maintaining discipline in a virtual environment posed its own set of challenges for teachers, as some students misused the platform for non-academic purposes.

Additionally, teachers expressed feeling less emotionally connected to students in the virtual classroom, which could affect the quality of teaching and learning. In all, the challenges faced by teachers in using virtual classroom platforms in Lagos State during the COVID-19 lockdown encompassed issues related to digital literacy, student access, network problems, data costs, power supply, engagement, preparation, parental support, discipline, and emotional connection. These challenges underline the complexities and disparities in transitioning to online education, especially in a diverse educational landscape like Lagos State.

Question 4a&4b:

What are the major rules guiding virtual classroom learning? Are the rules guiding the virtual classroom followed by teachers during COVID-19?

Presentation Responses

In response to research questions 4a and 4b, the principals shared valuable insights regarding the major rules governing virtual classroom learning and the extent to which these rules were

followed by teachers during the COVID-19 pandemic. During the virtual classroom experience, it was noted that several key rules were in place. Firstly, attendance was deemed compulsory, and an efficiently organized schedule was provided to ensure both teachers and students were well-prepared for their virtual sessions. Students were instructed to mute themselves unless explicitly directed otherwise. An essential "golden rule" was emphasized, requiring teachers to be the last to exit the virtual session. Impressively, approximately 80% compliance was achieved, showcasing the dedication of both teachers and students to adhere to these guidelines.

Furthermore, participants highlighted that the virtual classroom operated with a meticulously prepared and scheduled timetable. Students were strongly advised to mute their microphones to maintain a focused and distraction-free environment during class. There was also an emphasis on punctuality. However, it was acknowledged that full compliance wasn't always possible due to occasional rescheduling caused by personal reasons. Additionally, the discussion revolved around rules that included raising hands to ask questions, refraining from making rude comments, and ensuring that teachers had prepared their lesson notes in advance. Students were required to keep their microphones muted unless they needed to raise an issue. Encouragingly, it was reported that teachers diligently adhered to these rules. Moreover, the interviews revealed that adherence to the rules was not confined to one particular school; rather, these rules were followed consistently by teachers across different institutions. Timetables were strictly adhered to, links were shared on general platforms, and assignments were distributed and assessed by teachers. While some occasional lapses occurred, overall compliance remained high.

The engagement of heads of departments in WhatsApp groups aimed to monitor and maintain adherence to the rules, despite the unique challenges posed by the circumstances. Emphasis was placed on discouraging the use of emojis during class, adhering to the provided timetables, and

accurately recording student attendance. Teachers consistently marked assignments and ensured active student participation.

Furthermore, the interviews highlighted measures taken to enforce rules, such as students being temporarily removed from the group for violating guidelines. Students were also advised to follow timetables diligently, maintain silence during classes, and log in promptly. The involvement of parents in addressing issues related to student focus added an extra layer of support. In all, these reports offer valuable insights into the rules governing virtual classroom learning and the commendable level of compliance by both teachers and students during the challenging circumstances of the COVID-19 pandemic. The overarching themes of punctuality, mute etiquette, and the creation of a respectful online learning environment were central to these rules and their enforcement.

Research Question Five: Question 5:

What were some of the attitudes exhibited by students during virtual platform teaching?

Presentation Responses

The interview with secondary school principals provides insight into the various attitudes exhibited by students during virtual platform teaching. These attitudes encompassed a wide spectrum, ranging from enthusiasm to encountering challenges and distractions. In response to Question 5, principals from different schools shared their observations:

Many students showed genuine excitement towards virtual learning, perceiving it as a fresh and innovative approach to education. However, alongside these positive sentiments, some students displayed negative behaviours, including truancy, the posting of irrelevant content, and, in some concerning instances, the sharing of inappropriate materials like nude photos. Although enthusiasm existed, issues related to concentration, lateness, and non-punctuality were frequently

noted. It's important to note that despite these challenges, a substantial number of students responded positively to the virtual learning environment.

Additionally, students appeared to fall into two distinct categories. On one hand, there were active participants, often referred to as "serious contributors," while on the other hand, some students adopted a more passive approach to virtual learning. In terms of the challenges posed by the virtual environment, there were reports of exposure to social vices, including instances of truancy, bullying, and informal social interactions within the virtual platform.

Nevertheless, amidst these distractions, many students demonstrated a willingness to engage actively in virtual classes, demonstrating a level of excitement about this innovative mode of learning. Absenteeism was an issue that emerged, but it did not overshadow the overall positive attitude of numerous students towards this new learning approach. The digital divide became evident as some students exhibited nonchalant attitudes, primarily stemming from the unavailability of smartphones, which underscored disparities in access to technology. Despite this, there were students who exhibited positive traits, such as being interested and committed, albeit occasional lateness and the use of inappropriate language.

Furthermore, confidence in using virtual platforms for learning was present among certain students, while others faced challenges like missing classes, lateness, and a lack of punctuality. Phobias related to technology, pessimism, and complaints about data availability were also expressed by some. In response, educators had to contend with issues like absenteeism, noise, distractions, and late attendance, though a notable group of students eagerly embraced virtual assignments.

Nonetheless, a sense of complacency, humour, and a lack of commitment were reported as negative behaviours in some instances. The absence of commitment was particularly evident in

students' responses to assignments, which raised concerns. The unavailability of smartphones and data posed significant obstacles for some students, leading to discouragement. Others faced challenges due to their parents' work schedules, which hindered their engagement with virtual teaching. However, for many, this new mode of learning fostered a sense of belonging to school and allowed for the sharing of educational activities and ideas, promoting punctuality and a keen interest in learning. Among students, there was a diverse range of behaviours and attitudes. Some exhibited positive traits such as punctuality and eagerness to learn through the internet, which resulted in a more collaborative and knowledge-sharing environment. Unfortunately, there were also instances of exposure to social vices, leading to truancy and inattention during virtual classes. While some students demonstrated commitment, others remained nonchalant and occasionally absent, contributing to a mix of positive and negative attitudes.

Overall, students demonstrated enthusiasm, punctuality, and regular participation during virtual classes, reflecting their adaptability and resilience in the face of the challenges posed by the virtual learning environment. In summary, students' attitudes during virtual platform teaching were multifaceted, with some readily embracing the change and exhibiting commitment, while others encountered difficulties and engaged in negative behaviours influenced by factors such as smartphone availability and social dynamics.

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Chapter Five

Conclusion

This chapter dealt with summary of findings, conclusions, contribution to knowledge and the areas of further research.

5.1 Summary of Findings

The research investigated secondary school students' attitudes towards learning in Lagos State during and after the COVID-19 Era. The study found that during the pandemic, a large portion of students felt confident in understanding new concepts, indicating adaptability.

Research question two aimed to assess the digital competence of secondary school teachers in Lagos State during and after the COVID-19 Era. The results were categorized into Commitment, Collaboration, Communication, Planning, Directing, and Organizing, these findings offer valuable insights for educational policymakers and institutions to provide targeted support and training initiatives. Teachers' continued dedication to refining digital competence contributes to their effectiveness in the evolving educational landscape after the lockdown.

Research question three aimed to uncover trends in using virtual classroom platforms for teaching secondary school students in Lagos State during and after the COVID-19 Era. The findings, presented in two tables, provide insights into the adoption rates and frequency of various virtual teaching tools. During the pandemic, WhatsApp emerged as the most widely used platform for continuous education. The pandemic accelerated digital integration, while the post-pandemic phase saw a nuanced convergence of virtual and traditional teaching tools. These insights offer valuable guidance for educators, policymakers, and researchers, helping them navigate the evolving educational landscape by leveraging diverse platforms to enhance teaching and learning experiences.

Research question four aimed to identify challenges faced by secondary school students in Lagos State while using virtual classroom platforms during and after the COVID-19 Era. The findings revealed several significant hurdles that impacted virtual teaching efforts. During the pandemic, irregular power supply posed a major challenge, affecting a substantial portion of teachers often

or occasionally. Overall, the findings underline the consistent and pressing challenges faced by educators during and after the pandemic. These results emphasize the importance of addressing these issues to create an environment conducive to effective virtual education.

Research question five aimed to explore challenges faced by teachers in Lagos State when utilizing virtual classroom platforms, both during and after the COVID-19 Era. The findings shed light on the significant obstacles that affected virtual teaching efforts. These results emphasize the need for ongoing efforts to address these issues and create an environment conducive to effective virtual education.

Research question six focused on the level of teacher compliance with rules governing virtual teaching during and after the COVID-19 pandemic. The findings reveal the extent to which teachers adhered to specific guidelines, shedding light on their commitment to effective virtual education. These results emphasize the dynamic nature of teacher compliance and its importance in maintaining effective virtual education practices.

Research Question Seven investigates students' compliance with rules governing virtual classroom platforms during the COVID-19 Era and after the pandemic in Lagos State. Result shows that the findings from both tables highlight students' strong commitment to adhering to rules governing virtual classroom platforms. In both eras, students consistently displayed high levels of compliance across various rules, indicating their dedication to maintaining a conducive and respectful virtual learning environment.

Test of hypothesis one demonstrates the vital role played by digital teacher's competence and the virtual classroom platform in shaping student attitudes towards learning during the COVID-19 Era. The significant combined influence of these predictors underscores the importance of effective digital teaching practices and technology integration in maintaining positive student attitudes even in challenging times.

Test of hypothesis two highlight the intricate web of factors that shape students' attitudes towards learning during the COVID-19 Era. Both digital teacher's competence and the virtual classroom platform exerted significant and combined influences on student attitudes. Among the individual components, effective communication, commitment, directing, and organizing emerged as particularly influential. These findings underscore the critical role that teachers' skills and virtual learning environments play in fostering positive learning attitudes in challenging circumstances.

Test of hypothesis three revealed a significant gender difference in school students' attitudes toward learning during the COVID-19 Era in Lagos State. The p-value obtained (0.662) exceeded the common threshold of 0.05 for statistical significance. Therefore, Hypothesis H03, which asserted no significant gender difference, was accepted at the 0.05 level of significance. This suggests that, based on the data analyzed, gender did not play a significant role in influencing students' attitudes toward learning during the COVID-19 Era in Lagos State.

Test of hypothesis four revealed a significant school type difference in digital teacher's competence among secondary school students in Lagos State. This suggests that the observed difference in digital teacher's competence between public and private school students is statistically significant. This indicates that there is indeed a significant school type difference in digital teacher's competence among secondary school students in Lagos State.

5.2 Conclusion

Secondary school students in Lagos State demonstrated remarkable adaptability, commitment, and growth-oriented mindsets during and after the COVID-19 Era. Despite challenges, a significant majority showcased confidence, dedication to studies, and perseverance in achieving academic goals. The findings underscore their ability to embrace online learning tools, practice self-discipline, and maintain a positive attitude, indicating resilience amidst adversity. The consistent positive attitude towards learning, highlights their unwavering determination and dedication to education throughout the pandemic and its aftermath.

Secondary school teachers in Lagos State exhibited significant digital competence during and after the COVID-19 Era. Across categories like Commitment, Collaboration, Communication, Planning, Directing and Organizing, teachers showcased confidence in digital technology integration and readiness to collaborate and communicate effectively. Although some areas experienced slight declines post-lockdown, the sustained high weighted mean underscores their resilience and commitment to improving digital teaching approaches.

WhatsApp and zoom emerged as dominant tools during the pandemic, showcasing high adoption rates for continuous education and interactive lessons. Post-pandemic, while some shifts occurred, Zoom's popularity persisted, and digital tools like Google Meet and Telegram maintained relevance.

The research reveals significant challenges encountered by secondary school students in Lagos State while utilizing virtual classroom platforms during and after the COVID-19 Era. These challenges included irregular power supply, financial limitations due to data costs, unreliable internet connectivity, limited interaction with peers, device availability, and familial distractions. These hurdles were persistent, for the pandemic and post-pandemic phases respectively. The

study underscores the ongoing need to address these challenges to facilitate a conducive environment for successful virtual education. Teachers in Lagos State faced significant challenges while utilizing virtual classroom platforms during and after the COVID-19 Era. These hurdles encompassed irregular power supply, financial limitations, unreliable internet connectivity, difficulties in student engagement, limited device availability, and environmental distractions. These challenges remained persistent and impactful for the pandemic and post-pandemic phases, respectively. The study underscores the ongoing necessity to address these obstacles and establish an environment conducive to successful virtual education, highlighting the continued dedication required from educators in adapting to these challenges.

During the pandemic, teachers exhibited strong adherence to virtual classroom schedules, active participation in training sessions, and consistent implementation of strategies for student engagement and behaviour monitoring. Adherence to using appropriate tools displayed moderate levels. The result underscores commitment to rule adherence during the pandemic. In the post-lockdown phase, adherence to schedules remained moderate, while compliance with training sessions and implementation of engagement strategies showed reductions. Adherence to behaviour monitoring and tool usage also saw moderate compliance. The result reflects the aggregate compliance level post-lockdown. These findings highlight the dynamic nature of teacher compliance, underlining its significance in sustaining effective virtual education practices during and after the pandemic.

The study reveals that a substantial percentage consistently complied with virtual classroom rules, reflecting their dedication to maintaining a respectful and conducive learning environment. This commitment persisted across both periods, highlighting the enduring value students place on these rules. Furthermore, the research highlights the pivotal role played by teachers' digital

competence and the virtual classroom platform in shaping students' attitudes towards learning during the pandemic. The significant combined influence of these factors emphasizes the importance of effective digital teaching practices and the integration of technology, which proved essential in fostering positive student attitudes even in the face of challenging circumstances.

The results of the first hypothesis highlight the crucial role played by both digital teacher's competence and the virtual classroom management in shaping student attitudes towards learning during the COVID-19 Era. The significant combined influence of these predictors emphasizes the pivotal nature of effective digital teaching practices and the integration of technology. This study emphasises the need for skilled digital teaching techniques, a well-structured virtual learning environment, and maintaining good student attitudes even in trying situations.

The findings of the second hypothesis unravel the intricate interplay of factors influencing students' attitudes towards learning during the COVID-19 Era. Both digital teacher's competence and the virtual classroom platform exert substantial and combined influences on student attitudes. Among the individual components, effective communication, commitment, direction, and organization emerge as particularly influential. These results underscore the paramount importance of teachers' competencies and the virtual learning environment in cultivating favourable learning attitudes, especially in demanding circumstances.

The outcomes of the third hypothesis reveal a significant gender difference in students' attitudes toward learning during the COVID-19 Era in Lagos State. With a p-value exceeding the common threshold of 0.05 for statistical significance, Hypothesis H03 is accepted. This suggests that, based on the analysed data, gender did not play a significant role in shaping students' attitudes towards learning during the COVID-19 Era in Lagos State.

The results of the fourth hypothesis bring to light a noteworthy disparity in digital teacher's competence between public and private secondary school students in Lagos State. The statistically significant difference observed indicates that digital teacher's competence varies significantly based on school type. This implies that there is indeed a substantial distinction in digital teacher's competence among secondary school students in Lagos State, depending on whether they attend public or private school

5.3 Recommendations

Based on the findings of the study, the following recommendations were made:

1. To further enhance students' adaptability, commitment, and growth-oriented mindsets, educational institutions should integrate online learning tools effectively into their curricula. Encouraging the continued development of self-discipline, positive attitudes, and perseverance can be achieved through tailored interventions and motivational programs. Providing platforms for peer interaction and collaboration will help students maintain engagement and a sense of community, supporting their overall resilience and positive attitude towards learning.
2. To sustain and build upon teachers' digital competence, educational institutions should offer continuous professional development that focuses on effective digital teaching strategies and technology integration. Providing opportunities for collaboration and sharing of best practices can further enhance teachers' skills and confidence. Addressing specific challenges faced by teachers, such as adapting to post-lockdown changes, can be accomplished through targeted training and support initiatives. These efforts will ensure educators remain effective and resilient in the evolving educational landscape.

3. Educational institutions should prioritize a balanced integration of virtual classroom platforms such as WhatsApp, Zoom, Google Meet, and Telegram. This requires offering training sessions for teachers to maximize the potential of these tools for interactive and engaging lessons. Institutions should also provide comprehensive guidelines for selecting the appropriate platform based on instructional needs. By fostering a dynamic blend of digital and traditional methods, schools can optimize teaching and learning experiences, ensuring a seamless transition between virtual and in-person instruction.
4. To address challenges faced by students and teachers during and after the pandemic, educational institutions should collaborate with relevant stakeholders to improve infrastructure for power supply, reliable internet connectivity, and access to devices. Financial support or subsidies for data costs can alleviate the burden on both students and teachers. Establishing clear guidelines for managing distractions and maintaining a focused learning environment will further enhance the virtual education experience.
5. Educational institutions should offer continuous support and resources to help teachers maintain high levels of compliance with virtual classroom rules. Regular communication and training sessions can reinforce the importance of adhering to schedules, engaging students effectively, and using appropriate tools. Institutions should also consider flexible strategies to accommodate variations in compliance levels post-lockdown, ensuring a seamless transition to evolving teaching practices.
6. To maintain positive student attitudes towards learning, educational institutions should continue prioritizing effective digital teaching practices and the integration of technology. Tailored interventions focusing on effective communication, commitment, direction, and organization can contribute to cultivating and sustaining positive attitudes in students.

Educational policymakers should allocate resources for teacher training and technological resources to ensure the enduring impact of these strategies.

7. While the study did not find a significant gender difference, educational institutions should remain vigilant about potential gender-related challenges in attitudes towards learning. Implementing gender-sensitive teaching approaches and creating an inclusive learning environment can help ensure that both male and female students feel engaged and motivated in their studies. Continuous monitoring and feedback mechanisms can also aid in identifying and addressing any emerging disparities.
8. Considering the significant disparity in digital competence observed between public and private school students, policymakers and educational institutions should work to bridge this gap. Offering targeted training programs for teachers in public schools can help uplift their digital competencies to ensure equitable learning experiences for all students. Collaboration with private institutions for knowledge sharing and mentorship can also contribute to harmonizing digital competence across different school types.

5.4 Contribution to Knowledge

The study sheds light on the remarkable adaptability, commitment, and growth-oriented mindsets displayed by secondary school students. Their confidence, dedication to studies, and perseverance in achieving academic goals even amidst challenges underscore their ability to embrace online learning tools, practice self-discipline, and maintain a positive attitude. This contribution highlights students' resilience and unwavering dedication to education throughout the pandemic and its aftermath.

The study's findings showcase the significant digital competence of secondary school teachers in Lagos State. Their confidence in digital technology integration, effective communication, collaboration, and planning abilities demonstrate their readiness to embrace the virtual teaching environment. This insight contributes to our understanding of how teachers adapted to the changing educational landscape, emphasizing the importance of continuous support and training. The study's exploration of virtual platform adoption, specifically the dominance of WhatsApp and Zoom during the pandemic, and their continued significance post-pandemic, provides valuable insights into the evolving educational landscape. This contribution informs educators, policymakers, and researchers about the effective integration of virtual platforms and the dynamic blend of digital and traditional methods for optimized teaching and learning experiences. By identifying the significant challenges faced by both students and teachers while utilizing virtual classroom platforms, the study highlights the practical hurdles that impacted virtual education. The persistent issues of irregular power supply, financial constraints, internet connectivity, and device availability underscore the ongoing need to address these obstacles to ensure a conducive learning environment.

The study's findings emphasize the dynamic nature of teacher compliance with virtual classroom rules. This contribution highlights the importance of continuous support and training in sustaining effective virtual education practices. It underscores the necessity for teachers to adapt their strategies as the educational landscape evolves, ensuring a structured and effective learning environment.

The study's insight into students' consistent adherence to virtual classroom rules indicates their commitment to maintaining a respectful and conducive learning environment. This finding

highlights the enduring value students place on rules, which contributes to understanding the importance of clear guidelines and expectations in virtual education settings.

The study's focus on the combined influence of teachers' digital competence and the virtual classroom management on students' attitudes towards learning emphasizes the integral role of effective teaching practices and technology integration. This contribution underscores the importance of both digital skills and the virtual learning environment in fostering positive student attitudes, even during challenging times.

The study's findings on gender differences and disparities between public and private school students contribute to the broader understanding of educational inequalities. While no significant gender difference was found in attitudes towards learning, the observed variation in digital teacher's competence based on school type highlights the need for equitable access to quality education and support for all students.

Theoretically, the study contributes to existing knowledge in the following ways:

The study makes a significant theoretical contribution by highlighting the remarkable adaptability, commitment, and growth-oriented mindsets demonstrated by secondary school students in Lagos State during and after the COVID-19 era. The findings emphasize the capacity of students to embrace online learning tools, practice self-discipline, and maintain positive attitudes, reflecting their resilience in the face of adversity. This contributes to the literature on student psychology and resilience in the context of digital education, providing insights into how students can thrive in challenging learning environments.

The study contributes to the theoretical understanding of teacher digital competence in the context of crisis-driven digital education. By assessing teachers' competence across various dimensions such as Commitment, Collaboration, Communication, Planning, and Organizing, the

study sheds light on the strengths and areas for improvement in their digital teaching approaches. This theoretical contribution is valuable for understanding the importance of ongoing training and support for educators in adapting to evolving educational landscapes.

The study provides theoretical insights into the dominance of specific virtual classroom platforms and tools during and after the pandemic. The sustained popularity of platforms like WhatsApp and Zoom, along with the emergence of new tools like Google Meet and Telegram, underscores the dynamic nature of technology adoption in education. This contributes to the literature on educational technology adoption and platform preferences, informing educators, policymakers, and researchers about the evolving digital learning landscape.

The research contributes theoretically by identifying and documenting the persistent challenges faced by both students and teachers in the virtual classroom environment. These challenges include issues related to infrastructure (power supply, internet connectivity), financial constraints, student engagement, and distractions. The study highlights the ongoing need to address these challenges to create a conducive virtual learning environment, adding to the theoretical understanding of barriers to digital education.

The study offers theoretical insights into teacher compliance with virtual classroom schedules, training sessions, and strategies for student engagement and behaviour monitoring. The findings show changes in compliance levels between the pandemic and post-pandemic phases, indicating the dynamic nature of teacher behaviour in the digital classroom. This contributes to the literature on teacher behaviour in online education settings, emphasizing the importance of consistency in adherence to established rules for effective virtual education.

The research contributes theoretically by demonstrating the significant combined influence of teachers' digital competence and the virtual classroom platform on students' attitudes toward learning. It underscores the importance of effective digital teaching practices and well-structured virtual learning environments in shaping positive student attitudes, even in challenging circumstances. This theoretical contribution extends our understanding of the factors that influence student motivation and engagement in digital education settings.

The study contributes theoretically by examining gender differences in students' attitudes toward learning and disparities in digital teacher competence between public and private school students. These findings provide insights into the intersectionality of factors influencing educational outcomes and the importance of addressing disparities in digital education resources and teacher training. This contributes to the theoretical discourse on equity and access in education.

Empirically, the study contributes to existing knowledge as follows:

This study empirically contributes by providing concrete evidence of secondary school students' resilience and adaptability during and after the COVID-19 Era in Lagos State. Through surveys and interview, the research quantifies students' adaptability, commitment, and growth-oriented mindsets. This empirical evidence adds depth to the understanding of how students respond to crisis-driven digital education, offering specific examples and statistics that support the theoretical notion of their resilience.

The research makes an empirical contribution by quantitatively assessing teachers' digital competence across various dimensions. By collecting data on teachers' confidence in digital technology integration, collaboration, communication, planning, and organizing skills, the study

provides empirical evidence of their readiness and proficiency in using digital tools for teaching. This empirical data offers insights into the strengths and areas of improvement for teachers.

Another empirical contribution of the study lies in the detailed analysis of virtual classroom platform usage among secondary school students and teachers in Lagos State. By collecting data on the adoption rates of platforms like WhatsApp, Zoom, Google Meet, and Telegram, the research empirically demonstrates which platforms were most popular and how their usage evolved over time. This empirical evidence informs educators and policymakers about the practical preferences of users in digital education.

The study empirically contributes by documenting and quantifying the challenges faced by both students and teachers in the virtual education environment. Through surveys and interviews, it provides concrete evidence of issues such as power supply interruptions, financial constraints, internet connectivity problems, student engagement difficulties, and distractions. This empirical data offers a clear picture of the obstacles that must be addressed to improve the virtual learning experience.

The empirical contribution is evident in the data collected regarding teacher compliance with virtual classroom schedules, training sessions, and strategies for student engagement and behaviour monitoring. By quantifying the level of compliance during the pandemic and post-pandemic phases, the research provides empirical evidence of how teacher behaviour changed over time. This empirical data adds depth to our understanding of teacher practices in digital education.

The study empirically demonstrates the significant influence of both teachers' digital competence and the virtual classroom platform on students' attitudes toward learning. Through statistical

analysis and data modelling, it provides empirical evidence of the combined impact of these factors on student motivation and engagement. This empirical contribution substantiates the theoretical notion that effective digital teaching practices and a well-structured virtual learning environment are crucial for shaping positive student attitudes.

Another empirical contribution of the study lies in the statistical analysis of gender differences in students' attitudes toward learning and disparities in digital teacher competence between public and private school students. By applying rigorous statistical tests and presenting empirical data, the research provides concrete evidence of these differences. This empirical evidence contributes to the empirical discourse on equity and access in education.

5.5 Areas for Further Studies

The following areas were suggested for further studies:

While this study focused on Lagos State, conducting a comparative analysis across different states in Nigeria could provide valuable insights into regional variations in virtual education experiences.

There is a need to explore the role of parents in supporting students' virtual education experiences could provide valuable insights into the broader ecosystem of virtual learning. Researchers could explore the extent to which parents are engaged in their children's virtual education, their challenges, and their perceptions of the effectiveness of virtual learning.

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Appendix I

Teachers' Questionnaire:

Digital Teachers Competence, Virtual Classroom Management (DTCVCM)

Dear Respondent,

This questionnaire is designed to collect information for research purposes only. Please note that any information given shall be treated anonymously. Feel free to provide honest feedback. Your responses will help to improve the teaching learning processes

Yours Sincerely
The Researcher

Section A

Demographic Data

Please read each statement and indicate the option you have chosen by ticking [√] in the appropriate box.

1 Gender: Male [] Female []

2 Age: 20-30 years [] 31-40 years [] 41-50 years [] Above 50 years []

3 Marital Status: Single [] Married []

4 Educational Qualification: NCE B.A.Ed. [] B.Ed.[] BSc Ed [] M. ed [] M.sc [] PhD []

5 Teaching Experience: Less than 10 years [] 11- 20 years [] 21 – 30 years [] Above 30 years[]

6 Subject: English [] Mathematics [] Others ?

If others are your response to the above, please specify your teaching subject in the space below

7 School Type: Public [] Private []

Section B

Using the scale below, how would you rate yourself in the following during COVID-19 lockdown? Please tick [✓] in the appropriate column on each question provided.

Below are the keys:

At all times [AAT] = 4 Points, sometimes [ST] = 3 Points,

Rarely [RL] = 2 Points, Not at all [NAL] = 1 Point.

Section B 1

Statements (During Lockdown) Digital Teachers Competence
And Virtual Classroom Management Questionnaire.

S/N		AAT	ST	RL	NAL
1	Feel confident in using digital technology effectively into my teaching				
2	Incorporating digital resources or tools into my lesson plan				
3	Trying new technologies or methods that involves the use of digital tools				
4	Engage in professional development activities to improve my digital teaching skills				
5	Collaboration with other teachers to integrate tools and resources into teaching and learning				
6	Frequently sharing best practices and successful teaching				
7	Collaborate with experiences are accessible and equitable for all students including those with diverse learning needs				
8	Collaborating with other teachers to create an implement effective online assessment that align with learning objectives and promotes students' success.				
9	Communicate with students through digital channels such as whatsapp, telegram, e-mail etc				
10	Establishing guidelines or expectations for student communication and behaviour when using digital tools				
11	Receive training on how to effectively communicate with students when using digital tools				
12	Monitor student's progress and engagement using digital tools				
13	Plan and structure virtual lessons to keep students engage and focused using digital tools				
14	Develop strategies for assessing students learning in the virtual classroom				
15	Communication regularly and clearly with students, parents/guardian about class expectations using digital tools in the virtual classroom				
16	Plan for contingencies and technical issues including backup plans for effective virtual classroom				
17	Establish clear guidelines and expectations for student's behavior in				

	virtual classrooms				
18	Complying with the stated timetable for virtual classes				
19	Use breaks out rooms for small group discussions and collaboration				
20	Foster a sense of community virtual activities for students				
21	Set clear goals for lessons in virtual classes				
22	Define roles and responsibilities for each student during classes				
23	Establish protocols for decision-making and communication				
24	Providing explicit instructions and feedback during virtual classes				

Statements (During Lockdown) Teachers Compliance to Virtual Classroom during COVID-19 Lockdown

25	Consistently following virtual classroom schedule				
26	Attend training sessions provided to enhance my use of virtual classroom platform				
27	Implement strategies to encourage student's engagement and participation during virtual classroom sessions				
28	Monitor students' behaviour and communication during virtual classroom session to ensure they adhere to appropriate conduct				
29	Use appropriate tools to facilitate virtual classroom session such as breakout room				
30	Which of the following is the most frequently used virtual classroom platforms during COVID-19				
	i. Radio				
	ii. Television				
	iii. Goggle Meet				
	iv. Telegram				
	v. Zoom				
	vi. WhatsApp				
31	Which of the following obstacles do you experience while using virtual classroom platforms during COVID-19				
	i. Irregular power supply				
	ii. High cost of subscription				
	iii. Poor Internet				
	iv. No one-on-on with students				
	v. Non-availability of smart phones or desktops by students				
	vi. Distractions from the environment				

Section B2

Statements (After Lockdown) Digital Teachers Competence

And Virtual Classroom Management Questionnaire

S/N		AAT	ST	RL	NAL
1	Feel confident in using digital technology effectively into my teaching after lockdown				
2	Incorporating digital resources or tools into my lesson plan after lockdown				
3	Trying new technologies or methods that involves the use of digital tools after lockdown				
4	Engage in professional development activities to improve my digital teaching skills after lockdown				
5	Collaborating with other teachers to integrate tools and resources into teaching and learning after lockdown				
6	Frequently sharing best practices and successful teaching after lockdown				
7	Collaborate with experiences are accessible and equitable for all students including those with diverse learning needs after lockdown				
8	Collaborating with other teachers to create an implement effective online assessment that align with learning objectives and promotes students' success after lockdown				
9	Communicate with students through digital channels such as whatsapp, telegram, e-mail etc after lockdown				
10	Establishing guidelines or expectations for student communication and behavior when using digital tools after lockdown				
11	Receive training on how to effectively communicate with students when using digital tools after lockdown				
12	Monitor student's progress and engagement using digital tools after lockdown				
13	Plan and structure virtual lessons to keep students engage and focused using digital tools after lockdown				
14	Develop strategies for assessing students learning in the virtual classroom after lockdown				
15	Communication regularly and clearly with students, parents/guardian about class expectations using digital tools in the virtual classroom after lockdown				
16	Plan for contingencies and technical issues including backup plans for effective virtual classroom after lockdown				
17	Establish clear guidelines and expectations for student's behaviour in virtual classrooms after lockdown				
18	Complying with the stated timetable for virtual classes after lockdown				
19	Use breaks out rooms for small group discussions and collaboration after				

	lockdown				
20	Foster a sense of community virtual activities for students after lockdown				
21	Set clear goals for lessons in virtual classes after lockdown				
22	Define roles and responsibilities for each student during classes after lockdown				
23	Establish protocols for decision-making and communication after lockdown				
24	Providing explicit instructions and feedback during virtual classes after lockdown				

Statements (After Lockdown) Teachers Compliance to Virtual Classroom during COVID-19

25	Consistently following virtual classroom schedule after lockdown				
26	Attend training sessions provided to enhance my use of virtual classroom platform after lockdown				
27	Implement strategies to encourage student's engagement and participation during virtual classroom sessions after lockdown				
28	Monitor students' behaviour and communication during virtual classroom session to ensure they adhere to appropriate conduct after lockdown				
29	Use appropriate tools to facilitate virtual classroom session such as breakout room after lockdown				
30	Which of the following is the most frequently used virtual classroom platforms after COVID-19				
	i Radio				
	ii Television				
	iii Goggle Meet				
	iv Telegram				
	v Zoom				
	vi WhatsApp				
31	Which of the following obstacles do you experience while using virtual classroom platforms after COVID-19				
	i Irregular power supply				
	ii High cost of subscription				
	iii Poor Internet				
	iv No one-on-one with students				
	v non-availability of smart phones or desktops by students				
	vi Distractions from the environment				

Section C

Instruction

Use the following scale, please tick [✓] in the appropriate column in each question provided

The keys are: Strongly agree [SA] = 4 points, agree [A] = 3 points, disagree [D] = 2 points, Strongly Disagree [SD] = 1 point

		SA	A	D	SD
1.	Soliciting support from colleagues when needed helps in teaching delivery				
2	Better learning experience is created when teacher works together				
3	Collaborative teaching does not promote support for each other's professional growth				
4	Effective preparation before teaching wastes time				
5	Attending to students' assignment promptly promotes positive attitude in students				
6	Seeking new ideas improves teaching and learning processes				
7	Using more modes of communication promotes better learning.				
8	Encouraging participation makes learning interesting				
9	Asking students questions during the class not necessary.				
10	Effective planning makes learning interesting				
12	Proper planning inspires more respect from the students				
13	Goals of lesson not necessary at the planning stage				
14	Responding promptly to students' questions encourages positive attitude in them				
15	Following well prepared guidelines makes teaching and learning effective.				
16	Involving students in class activities discourages them from learning new concepts				
17	Effective instructions encourage more active response from the students				
18	Observing rules and regulations guiding virtual classroom teaching promotes positive attitude in students				
19	Maintaining orderliness distracts students' attention				

Appendix II

STUDENT'S QUESTIONNAIRE: Students Attitude to Learning During COVID-19

ERA (SATLCE)

Dear esteemed respondent, the instrument is designed to collect information for research purpose only. Please note that any information given shall be treated anonymously feel free to provide honest feedback. Your responses will help to improve our teaching and learning activities.

Yours Sincerely
The Researcher

Section A

Demographic Data

Instruction: Please read each statement and indicate the option you have chosen by ticking [✓] in the appropriate box.

1 Gender: Male [] Female []

2 Age: 12-15 years [] 16- 20 years []

3 School: Private [] Public []

Section B(1)

Using the scale below, how would you rate yourself in the following during COVID-19 lockdown? Please tick [✓] in the appropriate column on each question provided.

Below are the keys:

At all times [AAT] 4 Points, sometimes [ST] = 3 Points,
Rarely [RL] = 2 Points, Not at all [NAL] = 1Point.

Statements: Students Attitude Questionnaire During COVID-19 lockdown

		AAT	ST	RL	NAL
1	I am confident about my ability to learn new concepts				
2	I dedicate time and efforts to studying and completing assignments				
3	I get familiar with tools and its rules				
4	I adjust to online learning				

5	I create study plan and stick to it				
6	I avoid distractions such as social media or other non-academic issues				
7	I set goals for academic performance and work towards achieving them				
8	I persist in the face of difficulties or set back in your classes rather than giving up				
9	I take time to fully understand new concept				
10	I remain focused and engaged during virtual classroom teaching				
11	I maintain a positive attitude and avoid becoming frustrated when faced with challenges in virtual classroom				
12	I refrain from rushing through my assignments				
13	I follow the virtual classroom laydown rules				
14	I respect my classroom mate opinion and avoid inappropriate behavior such as using offensive language				
15	I raise my hands to ask questions or make comment				
16	I mute my phone when not speaking to minimizing background noise or distractions				
17	Which of the following challenges do you experience while learning in the virtual classroom				
	i. Irregular power supply				
	ii. Cost of mobile data				
	iii. Poor internet				
	iv. No access to my classmates				
	v. No smart phones, iPad or desktops				
	vi. Distractions from relations				

Using the scale below, rate yourself in terms of using the following virtual classroom platforms.

Please tick [✓] in the appropriate column on the question provided

Often (OFT)= 4points, seldom (SEL) =3points, rarely (RA) =2 points, Never (RA) =1 point

18	Which of the following is the most frequently used virtual classroom platforms during COVID-19		OFT	SEL	RA	NE
	i. Television					
	ii. Radio					
	iii. WhatsApp					
	iii. Telegram					
	iv. Zoom					
	v. Goggle meet					

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Section B2

Statements: Students attitude Questionnaire after COVID-19 Lockdown

		AAT	ST	RL	NAL
1	I am confident about my ability to learn new concepts after lockdown				
2	I dedicate time and efforts to studying and completing assignments after lockdown				
3	I get familiar with tools and its rules after lockdown				
4	I adjust to online learning after lockdown				
5	I create study plan and stick to it after lockdown				
6	I avoid distractions such as social media or other non-academic issues after lockdown				
7	I set goals for academic performance and work towards achieving them after lockdown				
8	I persist in the face of difficulties or set back in your classes rather than giving up after lockdown				
9	I take time to fully understand new concept after lockdown				
10	I remain focused and engaged during virtual classroom teaching after lockdown				
11	I maintain a positive attitude and avoid becoming frustrated when faced with challenges in virtual classroom after lockdown				
12	I refrain from rushing through my assignments after lockdown				
13	I follow the virtual classroom laydown rules after lockdown				
14	I respect my classroom mate opinion and avoid inappropriate behaviour such as using offensive language after lockdown				
15	I raise my hands to ask questions or make comment after lockdown				
16	I mute my phone when not speaking to minimizing background noise or distractions after lockdown				
17	Which of the following challenges do you experience while learning in the virtual classroom after lockdown				
	i. Irregular power supply				
	ii. Cost of mobile data				
	iii. Poor internet				
	iv. No access to my classmates				
	v. No smart phones, iPad or desktops				
	vi. Distractions from relations				

Using the scale below rate yourself in terms of using the following virtual classroom platforms. Please tick [✓] in the appropriate column on the question provided. Often (OFT) = 4points. Seldom (SEL)= 3 points, rarely (RA)=2points, never (NE) = 1point

18	Which of the following is the most frequently used virtual classroom platforms after COVID-19	OFT	SEL	RA	NE
	i. Television				
	ii. Radio				
	iii. WhatsApp				
	iii. Telegram				
	iv. Zoom				
	v. Goggle meet				

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Appendix III
Section D
School Principals Interview Questions

Guide to Interview Questions

I appreciate you taking the time to participate in this research. In this interview, the sorts of virtual classroom platforms, the challenges using them and the guidelines governing their usage in the teaching process during the COVID-19 pandemic are all to be identified. The 10 minutes interview will be accurately recorded by recording it. Your identity and the name of the school will remain confidential. I appeal to you, to be honest, upfront, and specific in your replies

Question

- 1 What are the virtual classroom platforms used by teachers for teaching and learning in COVID-19 lockdown in Lagos State Schools?
- 2 What the most frequently used virtual classrooms platforms for teaching and learning in Lagos State schools in COVID-19 lockdown?
- 3 What are some of the challenges faced by your teachers using virtual classroom platforms to teach the students?
- 4 What are the rules set by your school to monitor virtual classroom learning?

B. Are the rules been followed by your teachers?
- 5 What are some of the attitudes exhibited by students during virtual classroom teaching.

Appendix IV

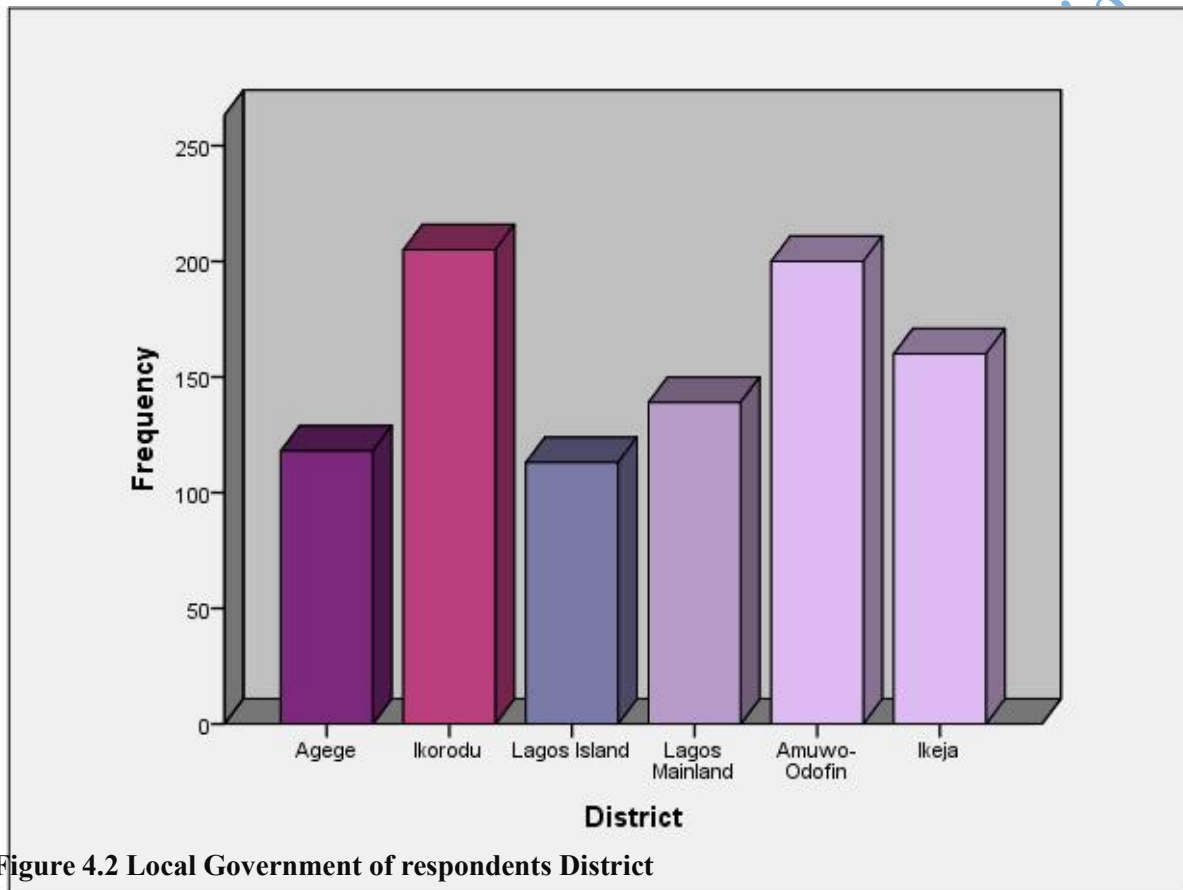


Figure 4.2 Local Government of respondents District

Appendix V

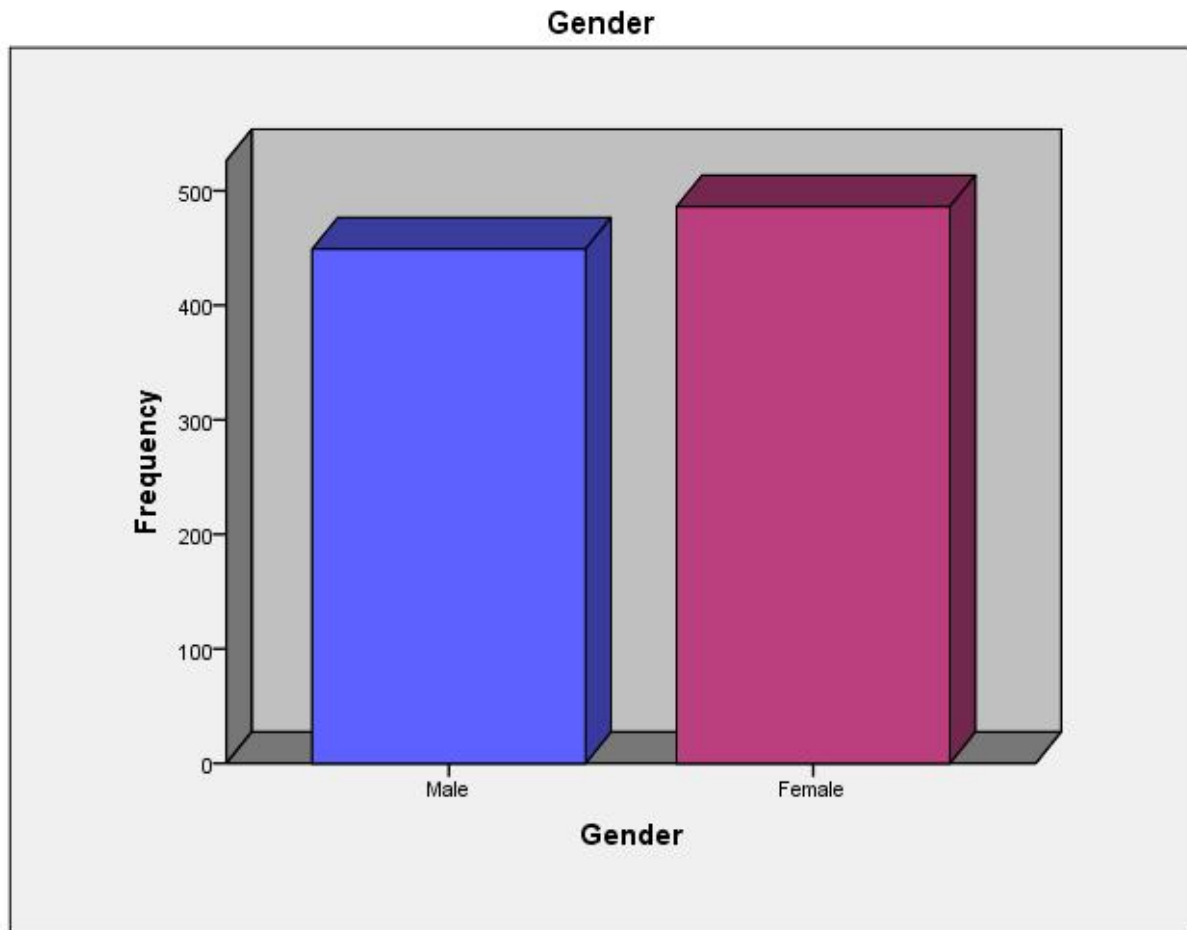


Figure 4.3 Gender Distribution of Respondents

Appendix VI

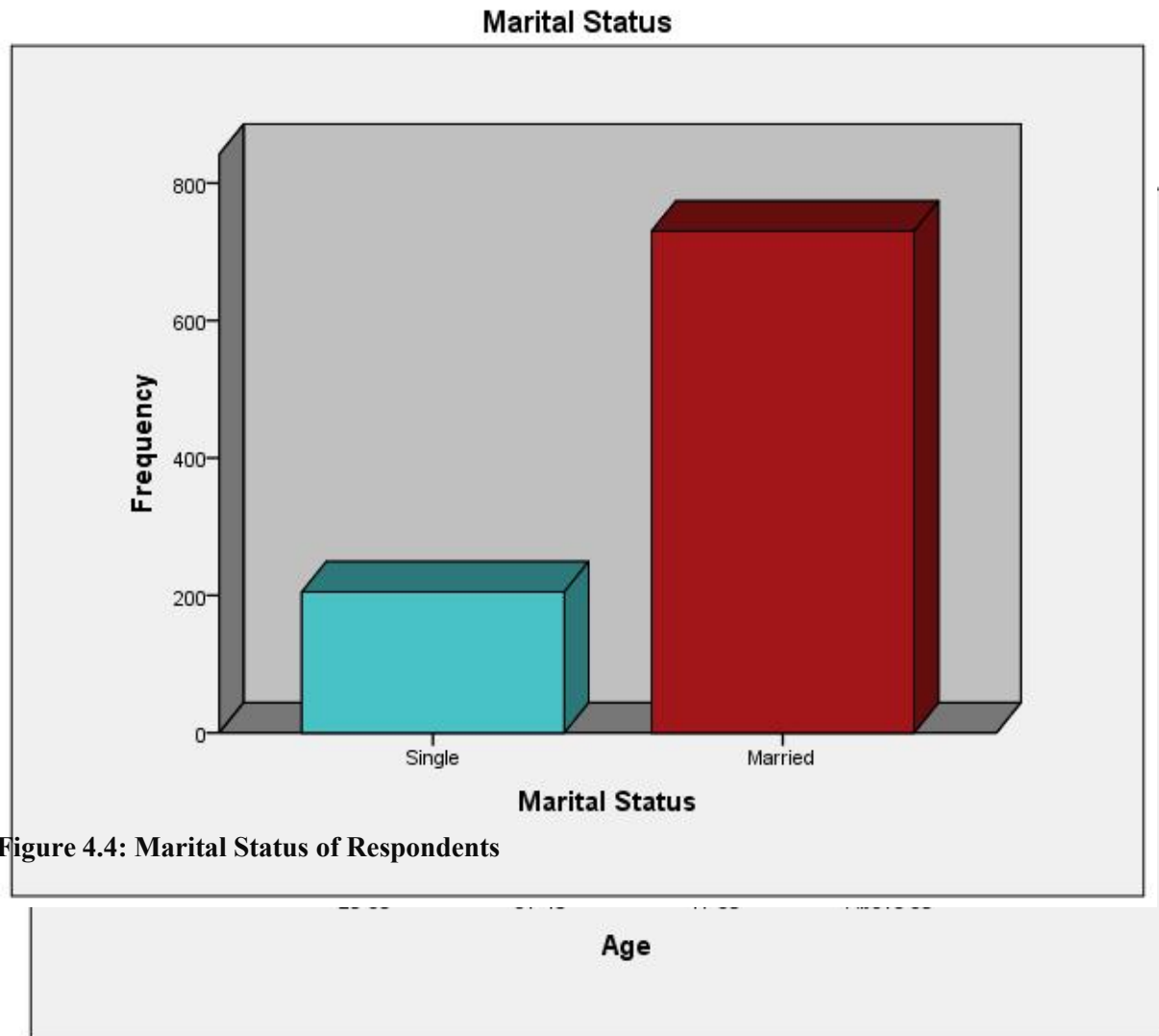


Figure 4.4: Marital Status of Respondents

Appendix VII

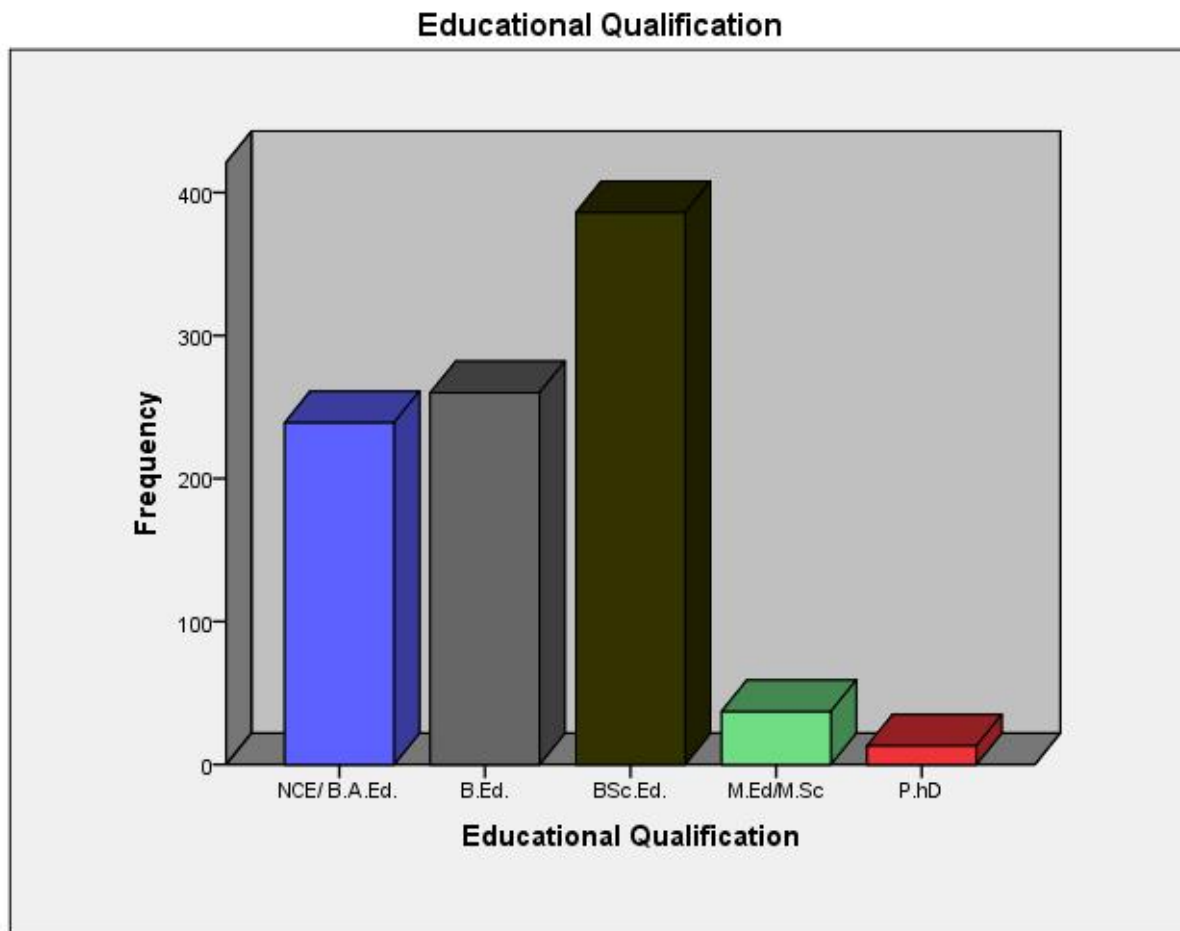


Figure 4.5 Educational Qualification of Respondents

Appendix VIII

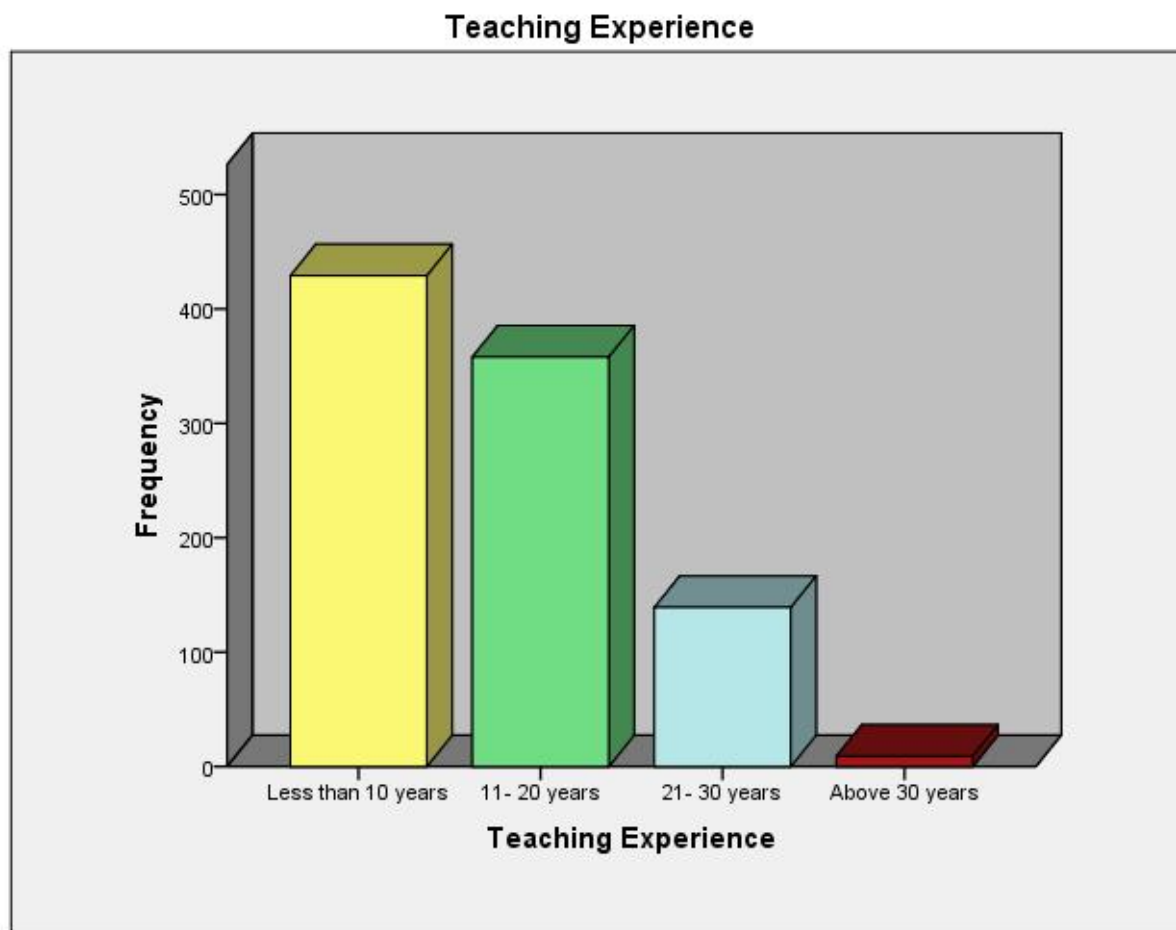


Figure 4.6 Teaching Experience of Respondents

Appendix IX

Subjects

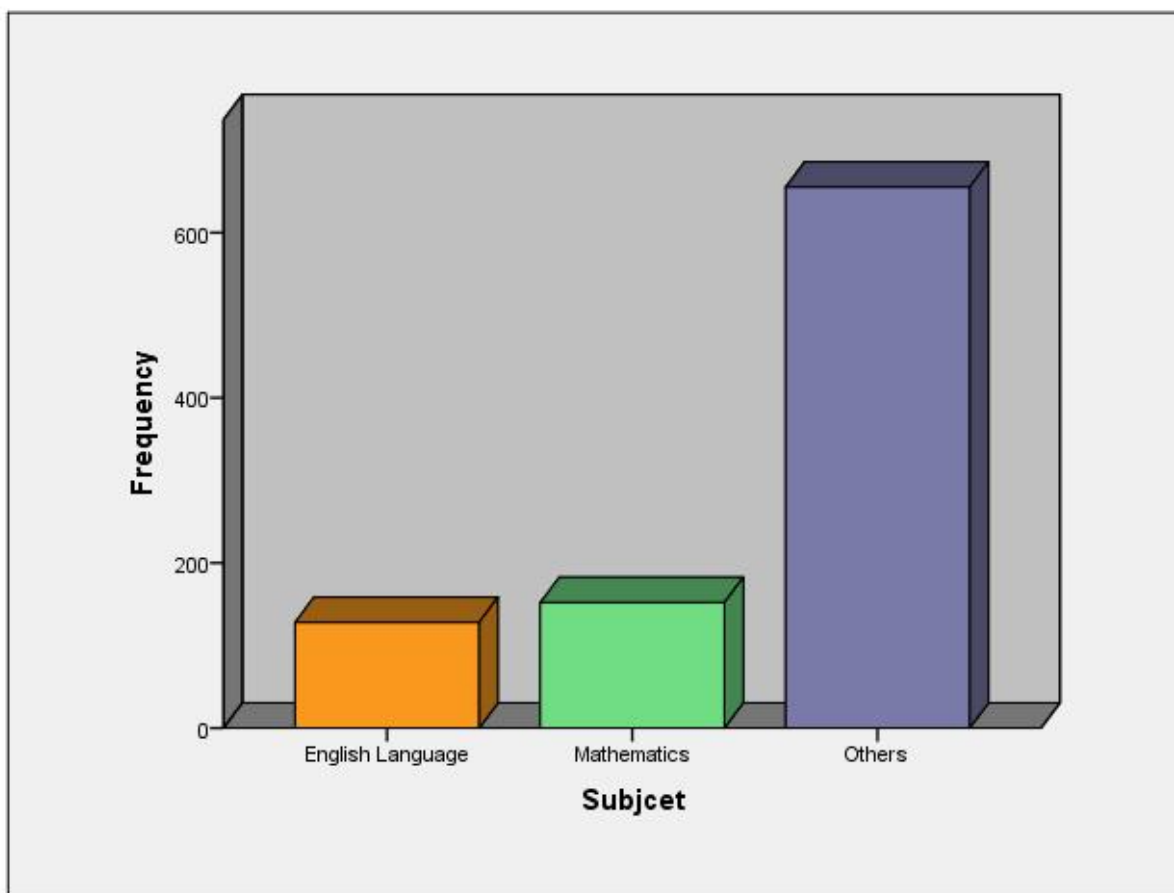


Figure 4:7 Subject Taught by Respondents

Appendix X

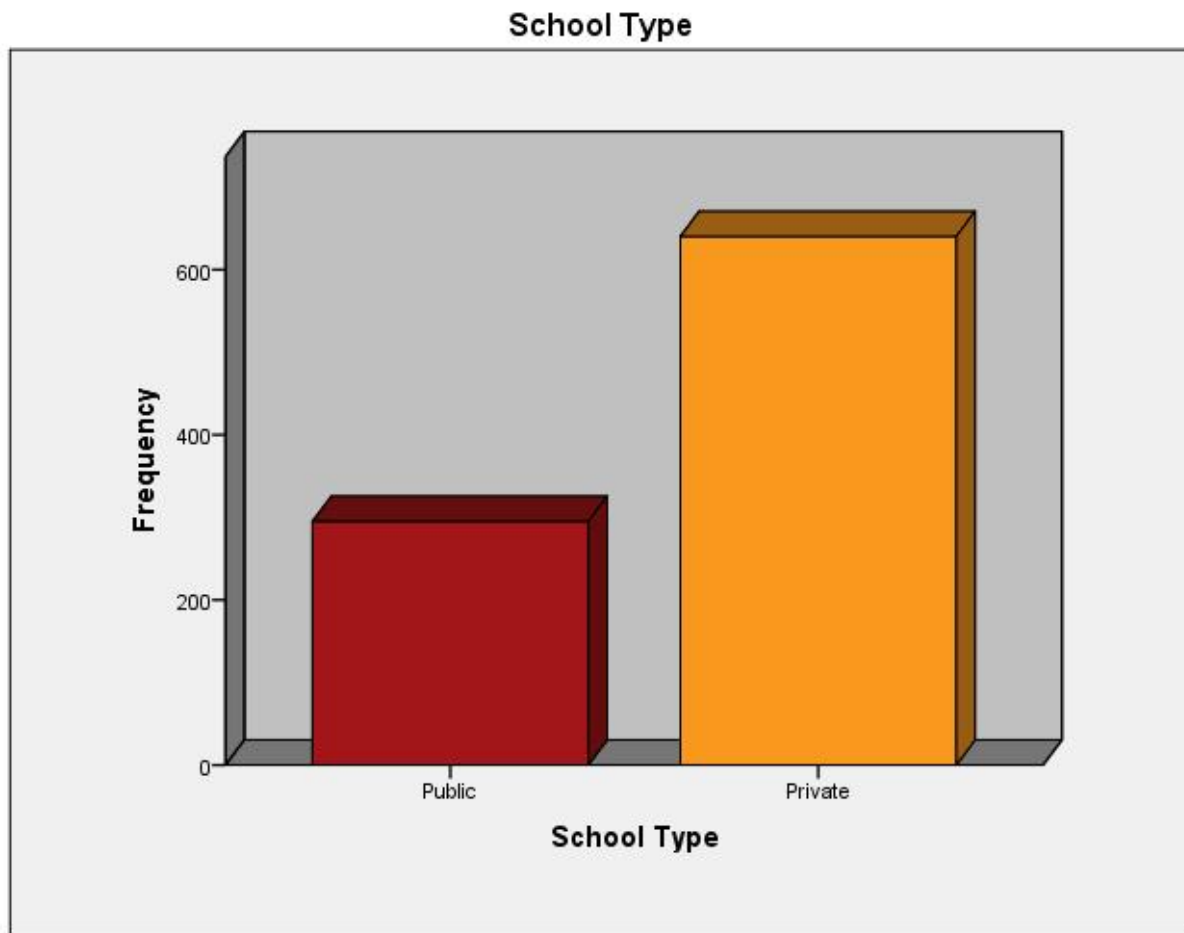
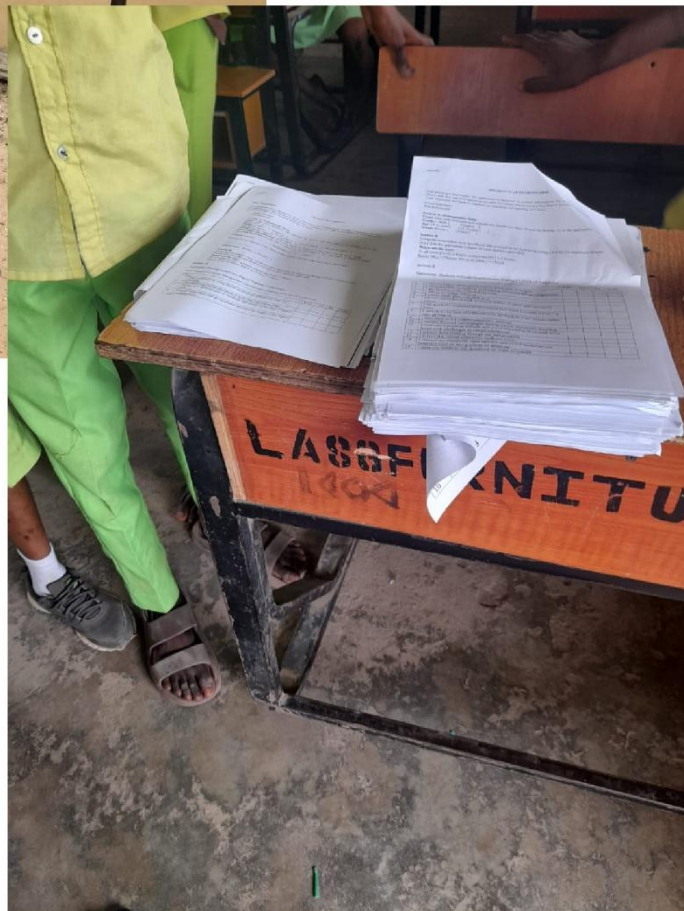


Figure 4.8: School Type of Respondents

APPENDIX XI

PHOTO TAKEN BY RESEARCHER ON FIELD







Bio - data

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Nationality: Nigerian

Educational Background:

Educational Institutions Attended with Dates and Qualifications

i Primary School:

Army Children School Mokola Ibadan (1966- 1971)

ii Secondary School:

Babalola Memorial Girls Grammar School, Ilesha (1973- 1978)

Iwoye-Ijesa Grammar School Iwoye- Ijesa (1981- 1982)

iii Higher Educational Institutions:

- Oyo State College of Education Ila- Orangun

National Certificate of Education (NCE History/ Christian Religious Studies (1985)

- University of Port- Harcourt
Bachelor of Education (B.Ed. Management & Planning/ History) 1987-1991
- University of Ibadan
Masters of Education (M.Ed. Management (Educational Admin) 1992-1994
- Lead City University Ibadan
Doctor of Philosophy Educational Management (Ph.D.) 2020-2023 (In view)

Working Experience with Dates:

- Oyo State Teaching Service Commission 1987-1994
Position: Class Teacher
- Lagos State Teaching Service Commission 1994-1999
Position: Class Teacher
- Federal Ministry of Education (NECO) 1999-2020
Position: State Administrator (Lagos, Osun, Abuja & Ogun States)

E. Membership of Academic Professional Bodies

- i. **TRCN**
- ii. **IAIEA (International Association for Innovations in Educational Assessment)**

F. Publication:

1. Thesis: Digital Teachers Competence, Virtual Classroom Management, and Secondary School Students Attitude Towards Learning in Covid-19 Era, Lagos State (about to be defended)
2. Scholarly Article:
 - i. OLADUNNI, J. FALORE & AFOLAKEMI, O. OREDEIN Virtual Classroom Management during COVID-19 in Nigeria: Insights from TPACKOI(O2) 2023, 188-197
 - ii. OLADUNNI, J. FALORE & AFOLAKEMI, O. OREDEIN Teachers Digital Competence: An Essential Tool for Virtual Classroom Teaching. Global Education Network in Collaboration with soft content. UK (**Accepted for Publication**) 2023

Professional Accomplishment:

- A. Entrusted to work and uphold protocols within cooperate office among high level management
- B. Interacted with stakeholders in education through training and retraining on issues related to external examinations
- C. Commended for the ability to solve difficulties challenges independently and efficiently.
- D. Assisted subordinates in achieving their goals through my leadership
- E. Increased departmental productivity through staff involvement in decision making

Major Conferences/ Workshops Attended:

- 1 Workshops from International Association for Innovation in Educational Assessment
- 2 Edumania-an International Multi-disciplinary.
- 3 Stakeholders in 2023 Educational for Sustainable Development 2023

References

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Date

The University Compliance Certification

This is to certify that the thesis by Julianah Oladunni FALORE with Matriculation Number LCU/PG/001950 in the Department of Arts and Social Science Education, Faculty of Education, Lead City University, Ibadan is in full compliance with the approved University Format and Style

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Date

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