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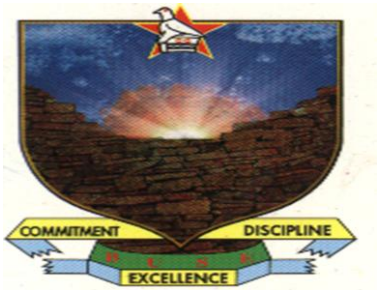

AN INVESTIGATION INTO CHALLENGES FACED BY TEACHERS WH USING DIGITAL LEARNING PLATFORMS IN TEACHING PHYSICS AT ORDINARY LEVEL IN SECONDARY SCHOOLS IN NYANGA DISTRICT

BY

DAWANYI VERONICA NYASHA

B231634B

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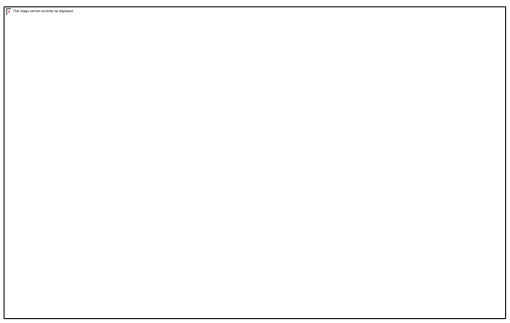

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Permanent Address: Regina Coeli High School

Box 75

Troubeck

Phone number **:** 0779570211

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I declare that, the dissertation, "AN INVESTIGATION INTO CHALLENGES FACED BY TEACHERS WH USING DIGITAL LEARNING PLATFORMS IN TEACHING PHYSICS AT ORDINARY LEVEL IN SECONDARY SCHOOLS IN NYANGA DISTRICT" is my work, and that all work of other people has been duly acknowledged and that this work has not been previously presented at this University and indeed any other University for similar purposes.

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I would like to thank my supervisor and friends for their support and encouragement towards my dissertation.. I also acknowledge my workmates at Regina Coeli high school for guidance and advice throughout the research. I would like to express my sincere and heartfelt gratitude to my husband and our children for their unwavering moral, financial and physical support towards this research project.

Lastly, I would like to thank the Almighty for giving me strength and wisdom throughout the research period

Dedication

I dedicate this project to my husband and children,Raymond and Elton

Abstract

The research aimed to investigate the challenges faced by teachers in using Digital learning platforms in teaching of Physics at Ordinary level in secondary schools in Nyanga district. High failure rate of learners specifically in Physics continues to be a threat globally, regionally, nationally, provincially and at district level, particularly Nyanga District. A lot of concerns have been raised globally regarding overall student achievement, student's interest in continuing to study Physics. As a science department we are moving towards digital learning though teachers face problems of weak internet, technical and pedagogical challenges via Digital learning platforms. However, even though teachers are facing challenges via Digital learning platforms but this application seems to cover syllabus on time and hence improving pass rates.

The study used mixed methods approach and employed a case study design that involved four high schools in Nyanga district. Interviews, questionnaires and observation guide were employed to gather data from the field. Through mixed approach, the research study aimed to answer the following research questions: What are the main digital platforms used by teachers in teaching of Physics at Ordinary level in Nyanga District? What are the challenges faced by teachers in using Digital learning platforms in the teaching of Physics at Ordinary level? How would you mitigate the challenges faced by Physics teachers in using Digital learning platforms as instructional tools? It was revealed that the lack of smart phones and inactive Physics students provide a major challenge in teaching and learning of Physics. Teachers claim that students were indiscipline and other learners appeared to be digital yet they are watching movies. Further, the lack of classroom management will be the greater problem of Digital learning platforms application. The research study recommends the school administration to adopt learning via Digital learning platforms as this helps in syllabus coverage and improves the pass rates of learners.

Table of Contents

List of tables .

List of figures

1.0 CHAPTER ONE: INTRODUCTION

1.1: Introduction to the study

Teaching and learning of Physics involves application of a diversity of teaching methods that will help to produce high performance standards in both internal and public examinations by learners. A number of researches were conducted recently investigating on Physics teaching using digital methods. Given this scenario, the researcher would want to bridge the research gap that has not been addressed and give more recommendations to other forthcoming researchers and other stakeholders in the education sector. This section covers a review to the background to the study, problem statement, research questions, and hyporesearch study. This chapter will also cover the assumptions, limitations and delimitation of the study. Significance of study, definition of key terms and abbreviations, organisation of the study and chapter summary are also discussed in this section.

1.2: Background to the study

In an article published by The Herald on March 30, 2022, Mutare district schools inspector said that the provision of necessary digital learning platforms to learners and teachers helped maintain a high pass rate. The Government of Zimbabwe has introduced numerous initiatives promoting the use of technology in education over last two decades. According to reports Education Technology (EdTech) Hub, Ministry of Primary and Secondary Education(MoPSE) has supported several initiatives strengthening the use of Information and Communication Technologies (ICTs) in education, such as Computerisation Programme launched in 2000, the Presidential E-learning Programme of 2011, and the Electronic Ministry Application Platform introduced in 2016. The Educational Policy of Zimbabwe states that the Government of Zimbabwe through the Ministry of Primary and Secondary Education commits to the use of ICT as an enabler for education to create, promote and sustain the development of a knowledgeable, innovative and creative society which ultimately supports the national agenda of attaining a knowledge-based society (Ministry of Primary and Secondary Education, 2019). According to a report by EdTech Hub, the ICT Policy for Primary and Secondary Education (2019-2023) aligns with the Constitution,

Education Act, Education Sector Strategic Plan and National Policy for ICT to be implemented in schools.

Surveys conducted in America over a decade (2005-2015) to systematically track learners' social media of the social networking sites revealed that social media use changed from 7% in 2005 to 65% in 2015 (Perrin, 2015).Past examination papers and examination tips from different Physics examiners were shared amongst the teachers on the Digital learning platforms groups. Experienced teachers make use of Digital learning platforms group to share expertise among teachers. Implementation of new curriculum in 2017 (Dokora, 2015; ZBC, 2017), the groups of teachers shifted their focus to new complex curriculum and resorted to extensive use of Digital learning platforms group to share and have their staff development concerning the interpretation of new curriculum for Physics Ordinary level. According to Sunday Mail Digital (2016) states that ICT is one of the learning areas in the new curriculum framework for all level of primary and secondary education. The new curriculum of Zimbabwe supports the use of Digital learning platforms in both primary and secondary schools. According to O-level Physics Syllabus (2015-2022, p.2) states that teachers are encouraged to use a combination of appropriate E-learning tools and problem solving to effectively and equitably engage and challenge their learners. Therefore the study seeks to find the challenges faced by Physics teachers at Ordinary level in the use of Digital learning platforms platform as a teaching tool.

Digital learning platforms, Zoom, Google Meet and Facebook are on upward trend during the period of 21st Century. Most of group A –schools like St David's Girls, St Georges, Peter House and Gateway adopted teaching Physics using digital tools (The Herald on March 30, 2022). However, little research is known on types of interactions that occur when teachers are involved in student conversation in groups. Currently, our school St David's Girls high allowed all students to use laptops and they bought unlimited Wifi for students to research but the school is failing to make use of it.

Physics is one of the fundamental of the sciences. It is the branch of science concerned with the nature and properties of matter and energy and it includes mechanics, heat, light and other radiation, sound, electricity, magnetism and the structure of atoms. As a subject, Physics has beauty and purpose of its own. Understanding of its beauty and purpose follows a very complex process because learning is coupled with mathematic representations and abstract

concepts which require more time, good time allocation per week and explore new technology via digital teaching and learning (Lewis et al., 2020).

Quality teaching involves implementation of different methodologies for example digital teaching and face to face teaching that produces quality education. Specifically, it contributes to student's achievement in school. This is a battle cry for optimistic educator especially in learning Physics. Physics teachers are faced with many obstacles in helping students to educate themselves to meet a specific and technology world in the classroom; they are dealing with several students who are reluctant to understand Physics because for the students, it is a subject that is very abstract in nature, thus difficult and not interesting.

High failure rate of learners specifically in Physics continues to be a threat globally, regionally, nationally, provincially and at district level, particularly Nyanga District. Currently, students would start pointing fingers to the teacher as a mediocre that failed to deliver and complete the National syllabus in time yet the current problem of a deficit of 130 minutes cannot be seen on part of learners. A lot of concerns have been raised globally regarding overall student achievement, student's interest in continuing to study Physics and the huge number of Physics dropouts, (Buabeng, 2012, Pockley, 2013). The main challenge of using traditional way of teaching Physics that the students have encountered are self – studying, lack of sleep and lack of time to study other subjects due to the great number of activities, tight timetable and would cause students to lose focus in pursuing Physics. Pockley (2013 outlined measures by physicists to reverse the 'worrying decline" in the number of students taking Physics. However, in using Digital learning platforms as an instruction tool, the teachers would encounter challenges and therefore the study investigate the challenges faced by teacher and seek proposed solutions to mitigate these challenges.

Learning of students in Physics is a very complex process partly because of abstract nature of many scientific concepts and their representations using mathematics language. Thus, it can be considered as one of the factors in student's achievement. However, this study investigates the challenges in using Digital learning platforms as an instruction tool when teaching physics at ordinary level.

1.3: Purpose of the study

The purpose of this study is to investigate the challenges faced by teachers in using Digital learning platforms in teaching of Physics at Ordinary level.

1.4: Statement of the problem

Poor student performances in Physics at Ordinary school level remain a threat to the school authority and administration at large. The poor performance is due to inadequate face to face teaching time with learners due to a packed school timetable which give less time to both teachers and students per week than the expected time by the Physics National syllabus.

Students are failing to get enough time for their lessons due to a tight timetable schedule. According to Ordinary level Physics syllabus (2015-2022), Physics should be conducted at least a minimum of eight periods of 35 minutes each in a week making a total of 280 minutes per week. However, in the case of St David's Girls learners will be allocated five periods of 30 minutes per week making a total of 150 minutes per week. A deficit of 130 minutes per week would create more pressure on students. If the school administration and responsible authority do not look for solutions pertaining to this problem, students will end up developing a negative attitude towards Physics, other learners would be frustrated and they decided to drop Physics at Ordinary level and they focus only on easy subjects (Blickenstaff, 2010). Bull et al. (2010) states that students tend to develop an attitude towards Physics since their timetable for Physics has a deficit of 130 minutes per week.

High failure rate of learners specifically in Physics continues to be a threat globally, regionally, nationally, provincially and at district level, particularly Nyanga District. According to BUSE Baseline Survey (2015), they conducted a national survey on the trends of Ordinary level pass rates across different subjects from 2010 to 2013. They revealed that the pass rate for Physics at national level stands at 53.89 percent for the year 2013. This survey is evidence that learners are struggling in the mastery of Physics at Ordinary level nationwide. In addition, Nyanga District Education (2021) a total candidature of 402 Physics students failed in Physics with male having 30.1 percent and female having 40.3 percent pass rate. Therefore, the researcher seeks solutions to the existing problem of poor performance in Physics at Ordinary level by using Digital learning platforms as an effective digital instructional tool.

Currently, students would start pointing fingers to the teacher as a mediocre that failed to deliver and complete the National syllabus in time yet the current problem of a deficit of 130 minutes cannot be seen on part of learners. A lot of concerns have been raised globally regarding overall student achievement, student's interest in continuing to study Physics and the huge number of Physics dropouts, (Buabeng, 2012, Pockley, 2013). The main challenge of using traditional way of teaching Physics that the students have encountered are self – studying, lack of sleep and lack of time to study other subjects due to the great number of activities, tight timetable and would cause students to lose focus in pursuing Physics. Pockley (2013) outlined measures by physicists to reverse the 'worrying decline" in the number of students taking Physics by using Digital learning platforms as instructional tool.

1.5: Research questions

1.5.1 Main Research question

What are the main challenges faced by Physics teachers in schools in Nyanga District when using Digital learning platforms in the teaching of physics at Ordinary level ?

1.5.2: Sub-research questions.

a. What are the main digital platforms used by teachers in teaching of Physics at Ordinary level in Nyanga District?
b. What are the challenges faced by teachers in using Digital learning platforms in the teaching of Physics at Ordinary level?
c. How would you mitigate the challenges faced by Physics teachers in using Digital learning platforms as an instructional tools?

1.6: Objectives of research

1.6.1: Main research objective

The main objective of this research is to identify challenges faced by Physics teachers in Nyanga District when using Digital learning platforms in the teaching of Physics at Ordinary level.

1.6.2: Specific objectives:

The research seeks to:

a. Identify the main digital platforms used by teachers in teaching of Physics at Ordinary level in Nyanga District.
b. Outline the challenges faced by teachers in using Digital learning platforms in the teaching of Physics at Ordinary level.
c. Explain ways of mitigating the challenges faced by Physics teachers in using Digital learning platforms as an instructional tool.

1.7: Research hypotheses

The following hypotheses were tested using qualitative research design.

H0: Digital teaching is effective in the teaching and learning of Physics.

H1: Digital teaching is not effective in the teaching and learning of Physics.

1.8: The significance of the study

This study aims to benefit various education stakeholders such as teachers, learners, and the researcher, parents and the Ministry of Primary and Secondary education.

Teachers

Digital teaching offered a better experience for teachers. Some of the major advantages acquired by teachers who were using digital teaching include:

- Individual focused on students
- Ease of connecting with students.
- Increased engagement in classes
- Organised methods for checking and grading assignments.
- Upgrading technical skills for concepts delivery
- Improved effective communication between the teacher and students.

Moreover, there's no burden for teachers to compile and store assignments physically. By using digital tools assignments and projects or Continuous Assessment of Learning Activities (CALAs) can be organised and stored on the server. Digital teaching promotes a flexible schedule .Teachers can schedule classes for students that need guidance. Since digital teaching eliminates travelling, teachers can spend more downtime with their families.

Promotes smart work since the teacher will be creating subject related quizzes, tests and digital co-curricular exercises make classes engaging, and can be more easily done through the tools available with eLearning platform.

Learners

The findings of the study enable the students to have the opportunity to:

- Learn in engaging ways, such as through interactive features, simulations and collaboration with others across the province.
- Gain important transferable skills, including digital literacy, to support lifelong learning and employment opportunities.
- Increase efficiency in learning and accessibility.
- Access and share information more easily and readily.

Parents

A copy of this study will invite parents to be 'secret readers' in Digital learning platforms and will help parents to monitor discipline and behaviours of their children. Parents will be the teachers for their children, for example ask parents to volunteer to teach the class skills on how to dress properly. This fun way encourages parent involvement in the classroom.

Ministry of Primary and Secondary

A copy of the research will be submitted to Nyanga Education District office as this document helps in curriculum planning, implementation and formulation of strong policies that will help other schools which are not yet starting digital teaching.

1.9 Delimitations of the study

The study focuses on the challenges faced by teachers when using Digital learning platforms as instructional tools. This study focuses on Digital learning platforms such as Google meet, emails, Zoom, facebook instructional tool used by million teachers across the whole world to deliver Physics lessons.

The study was conducted at Regina Colei, Emmanuel, Nyanga Boys High, ST Marry's Magdalene high schools situated in Eastern highlands in the heart of Nyanga District.. The researcher wanted to conduct the study covering all secondary schools in Nyanga; however, the study was confined to form three and four Physics students and Physics teachers in the four high schools. These teachers and students were knowledgeable in Physics and were considered as suitable sources of the data relevant to the study. The researcher used

WhatsApp, phone, questionnaires, observations and interviews analysis to collect data at this school. The researcher decided to conduct a study particularly in Physics teaching because she is specialising in Physics and he has more than three years teaching experience at the same school hence has developed interest to improve teaching methodologies which accommodate 20st century students.

1.10: The limitations of study

Time was a limiting- factor which caused the researcher to use smaller sample. To solve this drawback, the researcher design suitable plan that suits for enough time to carry out the study. The researcher is a fulltime worker at Regina Coeli high school and have other duties like marking student's book, conducting Physics practical and planning for students work, hence, it was difficult to have a large sample for all schools in Nyanga District. The results of small samples were not a whole representation of form threes and form fours. However, the researcher used a purposive sampling to ensure that the sample is a representation of whole population.

Inadequate information, low returns rate of questionnaire and dishonest from participants also affected the study negatively. To mitigate that challenge, the researcher established a professional relationship with the participants and highlighted the benefits of the study. The participants were guaranteed that their confidentiality were not disclosed to anyone and will only be used for research purpose.

1.11: Definition of key terms

Physics: Is the study of the nature and properties of matter and energy in the universe and their interactions and relationships: includes mechanics, heat, and radiation.

WhatsApp: Is an instant messaging application that allows sending files, messages, images, videos, photos and digital chatter (Mursidi & Murdani, 2018)

Digital Platform: Is defined as a digital service that facilitates interactions between two or more distinct but interdependent sets of users who interact through the service via the internet (OECD, 2019)

1.12: Organisation of the study

The research comprises of five chapters. Chapter one presents topic, introduction, background of the study, purpose of the study, statement of the problem, research objectives.

In addition, this chapter also consists of significance of the study, delimitations and limitations to the study. On chapter two, presents literature review which gives a detailed explanation, theories to study and conceptual framework related to teaching Physics digital. Chapter three constitutes research methodology, research design, research approach, population, sample size and sampling, research instruments and data collection procedures and ethical considerations. Chapter four follows and it contains data analysis. Finally, chapter five comprises of summary, conclusions and recommendations.

1.13: Chapter summary

In this chapter the researcher gave an introduction to study, followed by background of the study. Major purpose of the research was cited and this purpose will lead to formulation of main research questions and sub-questions. Main research questions were constructed which then lead to the formulation of main research objectives. The researcher also showed the significance of the study. The delimitation confined the study to four high schools in Nyanga District. The researcher mentioned the limitations of the study and proposed ways of mitigating these limitations. In addition, the researcher gave the definition of key words and give simple meaning which can be understood by the stakeholders.

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

Digital teaching and learning is on upward trend during this twenty-first century generation. Technological advancement is inevitable and conditions of Covid-19 pandemic occurred in

2020 resulted in many institutions including secondary schools to adopt digital teaching and learning via Digital learning platforms, Google meet and Zoom. The related literature is going to unpack how digital teaching and learning via Digital learning platforms, Google meet, Zoom and many other tools are used in the teaching and learning of Ordinary and Advanced level Physics. These application tools used mobile technology. The chapter will also highlight the numerous advantages of these digital tools used in education.

Mobile Technology

Today's teachers and students are changing ways of learning, interacting, communicating and working collectively (Lai, 2015; Resta & Laferriere, 2007; Wood & Homan, 2003). It is an irrefutable fact that the use of computers and technological digital devices with microprocessors are the few educational tools that are changing the dynamics of classroom lectures, strengthening virtuality and access to digital information through the internet (Subhash & Cudney, 2018). Technology-enhanced approaches, due to their characteristics of access, connectivity, interaction between students and instructional resources or between students and teachers, and self-learning through specific applications (web and mobile), have transformed the traditional pedagogical practices (Kurt, 2014)

Both faculty and students can benefit from their mobile devices for academic activities (Spiegel & Rodriguez, 2016). The use of information and communication technologies (ICTs) such as the internet capable smartphones, laptops, tablets and net books help in education since it provides a variety of potential interconnected interactions within academic development (Barry, Murphy, & Drew, 2015).Outside the classroom, whether at home or in other contexts, the use of technological learning tools has allowed students to continue the process of understanding and comprehension of information, while being in constant communication with peers and instructors (Dobranky & Frymier, 2004; Kennewell, 2001).

2.2 Different digital platforms used by Ordinary Physics teachers

Digital learning platforms Platform

Digital learning platforms is an instant messaging and calling app for smart phones that allows users to freely access to send text, voice and video messages, and even share photos with other users over Internet. This application is one of the interactive social media, which allows chatting with friends, creating groups, and transmitting content in the form of the text,

image,vedio or audio(Cam and Can, 2019). The Digital learning platforms represents the most widespread and diverse new communication model in its communication uses.

During the pandemic of Corona virus most countries adopted the use of Digital learning platforms to deliver the lessons in secondary schools (Ramadan 2020; Tahoon 2021). The affected countries should resort to distance learning to reduce disruption that students and educational process as a whole will be exposed to (Al-Dahshan 2020). The method of digital education will help to stop the spread of Corona virus and ensure the continuation of basic field education

After the Covid-19 pandemic, all sectors of life are pretty much dependent upon the use of technology, especially digital content sharing application. Sahu (2014) states that field of education have been influenced by the digital technology and many computer-assisted programs were developed to be incorporated into teaching-learning process. The present study focuses on the role of Digital learning platforms messenger in teaching and learning. Digital learning platforms messenger is an instant messaging application with features for transferring data including text, content, images and audio and video files (Sahu, 2014). With the rise of Covid -19 and the imposed lockdown in most countries, the use of free content sharing applications rose. Google Classroom, Google Meet, Skype, Digital learning platforms, Microsoft Teams, and Zoom are a few examples of free resources that were used as tools for educational content delivery. Digital learning platforms is a free available messenger for IOS and android versions, and almost smart mobile phones use Digital learning platforms in daily message sharing (Nitra & Roman, 2016). Digital learning platforms was used as a medium to transfer educational content to the students during and after the pandemic

There were digital universities and high schools already using and benefiting from Digital learning platforms. For example Gasaymeh (2017) studied the use of Digital learning platforms by student for educational purposes and for educational content delivery. There are students reporting that Digital learning platforms groups facilitate communication between the students and the teacher thus cultivates a trustworthy environment and increases the interest of students in learning activities (Abu Alruz, 2014; Roblyer et al., 2010).

Google Meet: A Platform for Physics Class Discussion

The sudden shift in the digital mode of instruction has become a major issue in the global world that we are living in especially to the Philippines who is in foreign to this mode of learning. It was due to the fact that the widespread of the Covid-19 virus has caused a lot of economic turmoil since it existed in the global world in the year 2019 (Rotas & Cahapay, 2020). Many educational institutions have adopted various Learning Management Systems to continue the plight of education during pandemic. Google Classroom and Google Forms, Edmodo, and Facebook Messenger are some of the tools or programs used in activities, hangouts, modules, and other chores learners require for learning (John, 2020). During the pandemic in Indonesia, the government recommend the Rumah Belajar platform, which was produced by the Ministry of Education and Culture, and SPAD, which was created by the Ministry of Research, Technology, and Higher Education for Higher Education institutions. Rumah Belajar is a free internet learning platform for teachers and learners to use an elective learning resource. Sekolahmu, MejaKita, Ganeca Digital, KelasPintar, Ruang Guru, Quipper School, Cisco Webex, Zenius, and Google Classroom were among the web-based learning programs that the Indonesian Ministry of Education and Culture collaborated with (Octaberlina & Muslimin, 2020). According to France-Presse (2020), some platform alternatives that can be used are Facebook, Google Meet, Zoom, Skype and others

Among all these methods that are used in classroom discussion, Google Meet is one of the most commonly used virtual platforms in the country. Google Meet, also known as Google Hangouts Meet, is designed to allow dozens of participants to attend the same virtual meeting and chat or share video from any location with internet connection (John, 2020). Google Meet is very useful video communication tool. The Google Meet interface allows users to meet face to face directly and effectively, while also being incredibly light and fast. Management is simple and may be followed by a large number of people (Singh & Awasthi, 2020). According to Fakhruddin (2019), using Google Meet as a teaching-learning tool for speaking practices in an English classroom has been shown to improve learner's speaking skills. Learners can communicate more with friends and verbally expose and explore their speaking abilities when they use Google meet video conferencing (Fakhruddin, 2019).

The study of Aznam, Ctrawati, Hw, Kusdianto, and Setyawan (2020) finds the integration of Google Meet's media-assisted lecture strategies produces a unique learning experience for achieving learning goals such as knowledge building and learners learning outcomes while learning from home. Hence, Google Meet class foster teacher-learner and learner-learner interaction, communication, and the motivation in virtual courses (Benmansour, 2022).

Although various studies regarding Google Meet discussions have been published, there are relatively scant studies in the Philppines that tackle Google Meet as an digital platform for class discussion.

The Use of Digital learning platforms in Education

Social media provides unique affordance that the individuals contribute to knowledge sharing (Leonardi, 2017). Digital learning platforms is one of the most widely used communication tools on the planet (Digital learning platforms.com, 2021). In higher education, Digital learning platforms is an effective in communication tools for academics and students (Klein et al., 2018). In pandemic South Africa Digital learning platforms was the key social media tool for African international distance students to transfer knowledge, sustain relationships, and to support self-directed, autonomous learning (Madge et al., 2019). Digital learning platforms affords and improves interactivity, knowledge sharing, collaboration, ubiquity, and achievement (Klein et al., 2018; Nitra and Roman, 2016). During the pandemic, it has been surprisingly agile in the education and monitoring of students (Tarisayi and Munyaradzi, 2021). On the down-side, Digital learning platforms can disrupt learning communities in various ways, for example by creating an urgency to reply immediately, or by spreading disinformation (Ahad & Lim, 2014).

Digital learning platforms is described as the second largest social in the world. It has more than a billion and half active subscribers according to statistics of 2017. I t is known and familiar to both students and their families and teachers as well. It is necessary to use an educational tool through which it can increase communication between the teacher and the student. The following are some ways in which Digital learning platforms can be used in education:

Encouraging Students to Cooperate

Digital learning platforms allows group creation, which can be used to give some collaborative task such as problems on Physics need collaboration; as it possible to divide the students in the classroom into several groups, each of which has tasks to complete in specific period of time, and thus helps team spirit and obtain fruitful results. It is worth noting that the

teacher stayed informed about student's efforts, as well as assesses and supervises them to ensure their success (Habibi et al. 2018)

There is an increased use in content sharing applications. A few researchers have studied the use of such software and applications in teaching –learning process suggested Digital learning platforms as collaborative learning tool that has potential to increase the understanding and achievement of students (Cetinkaya, 2017). Digital learning platforms is used in Korea as a formal learning tool and includes graded learning activities in the semesters in their open universities (KNOU, 2017). With the emergence of digital education in schools, the easiest and most accessible application is Digital learning platforms, which does not require any sophisticated computer, mobile or laptop device but can be used in a smart phone, thus making it a more convenient teaching- learning process medium. Digital learning platforms is already embraced by the parents and teachers in Pakistan and thus the stakeholders in this research are already using it in their daily lives. The question of using it for educational purposes and feedback from all stakeholders makes it significant for all educational institutions in Pakistan.

The recent studies show a significant correlation between teaching activities through Digital learning platforms and the satisfaction level of students (Rosenberg & Asterhan, 2018).Digital learning platforms was further reported to include a repetitive mechanism that can contribute to the achievement of students (Saritepeci et al., 2019). The private schools have been using Digital learning platforms for more than one academic session, showing that the phenomenon is as significant in Pakistan.

Extending the time of the Educational process

Digital learning platforms provides a space that brings the teacher with the students and keeps them in contact all the, and with this degree of development, the teacher had to increase number of periods, increase the intensity of efforts exerted to achieve the goals of finishing syllabi in time. In addition, the teacher stays close to his students and his contact will help them to solve problems of Dynamics, Waves and Optics by sending detailed explanations, imposed duties and lessons in the form of text messages or multimedia; whether audio recordings, photos and videos, it helps clarifying difficult Physics concepts and avoiding confusion (Nasr and Mustafa 2018).

Increasing confidence between teachers and students

Many students are shy and hesitant to participate and interact in the classroom, and some of them are unable to communicate with the teacher directly, and negatively affects the student's educational achievement and the formation of his personality, and therefore the Digital learning platforms application can be used to overcome this building barrier and building trust with students by communicating with them and sending them explanations, asking them difficult questions or learning difficulties, and seeking to encourage them to be more interactive in the classroom (La Hanisi et al. 2018)

Creating an Interactive platform for students

The Digital learning platforms application can be dealt with as an interactive electronic platform that gives each student the right to express his or her opinion on any topic whatsoever. The effectiveness and strength of education have a role in improving student's production and expanding their thinking perceptions while providing notes and instructions they need to deal with to stop repeated errors (Hashemifardnia et al. 2018).

The concept of formal schooling includes interaction at student-student and student-teacher levels. Digital learning platforms has all components of facilitating that interaction digital (Roblyer et al., 2010). Human beings want to be involved in social activities and make friends, which are not restricted in Digital learning platforms, but to compare with face to face interactions in formal setting is quite challenging. Despite being the easiest way of socialising and maintaining relationships, face-to –face interactions have their own limitations that require constant remedies (Hendricks, 2017). Nevertheless, Digital learning platforms provides all the solutions to social interactions, content sharing, voice note recording, storing and transferring data, deleting irrelevant information, and retrieving what's needed. This makes social interaction an ever increasing and interesting phenomenon (Hendricks, 2017).

Staying in touch with parents

Most parents are keen to be aware of the personal and educational aspects of their children, instead of visiting the school constantly, and at the end of term, parents can stay in touch with the teachers and find out what they need information by creating groups. They communicate with them to evaluate performance and student's behaviour in a positive way (Oktaviani and Mandasari 2020)

Digital learning platforms as effective instructional tools

Digital learning platforms have features that can make sure the medium of instruction is as effective as it can be in traditional classrooms (Durgungoz & Durgungoz, 2021). Students can ask questions during the lectures and can get further clarification about Physics assignments, quizzes, and examinations. Students can also connect with other students and continue to satisfy their social and emotional needs.

Teachers on the other hand can send both recorded and live videos lecture. The assessments and progress reports can be shared with students and parents (Oktaviani and Mandasari 2020). Student attendance can be monitored and parents can be brought on board in case there is lack of participation by students. Parents can conveniently use Digital learning platforms to learn about the academic activities and achievements of their children. Digital learning platforms also works equally well in mobile phones of different qualities, brands and functions the same in Android, IOS, and Windows. Digital learning platforms provide an equal learning opportunity to students of all types, genders, ethnicities, and other demographic subgroups (Durgungoz & Durgungoz, 2021).

Digital Learning communities

The socio-constructivist use of educational technology has seen the emergence of digital or virtual communities, since learning is shared, participatory activity, where "interpersonal transactions mediate the exchange of knowledge" (Ke and Hoadley, 2009 p488). Learning communities are "a learning atmosphere , a context providing a supportive system from which sustainable learning processes are gained through a dialogue and collaborative construction of knowledge by acquiring, generating, analysing, and structuring information" (Cahen &Jobring, 2005, p273). Digital communities need "commitment; connection to others; reciprocity; interaction; agency and consequences" (Hammond, 2017, p118). Problem based learning is a vehicle for building learning communities (Childs et al., 2015). Building a community requires a "therapeutic" facilitator (Bluteau, 2020). Therapeutic presence is a combination of social, cognitive, and teaching presence (Garrison, Anderson and Archer, 1999). Our analysis considers the activities of the two facilitators and the social dynamics such as the composition of groups that influenced how users share knowledge (Kwayu, Abubakre & Lal, 2021).

West and Williams's (2017) four "defining characteristics" of digital communities: access, relationships, vision, and function. Access goes beyond physical or geographic space and refers to the presence of community members. Types of presences include cognitive, social, and teaching presence, as per the community of inquiry model (Garrison, Anderson and Archer, 1999). Relationship extends beyond virtual physical access and presence. Relational boundaries are critical and may include a sense of belonging, interdependence and trust (West & Williams, 2017), while the effective use of digital social media network to support virtual community of practice is dependent on the participants' awareness of the context within which the community exists and the willingness of the participants to accept differing views and opinions (Moodley, 2019). Vision or sense of purpose refers to a collective identity and shared image of the group's function (West and Williams, 2017). Developing a core vision involves negotiating a common language and agenda to achieve the overarching learning goals. The boundaries between real and virtual environments are blurred when "Digital learning platforms is used as a key component in their way of dwelling with others" (O'Hara et al., 2014, p.1142). Function or functional cohesion, is about what community members do to release the common vision, while satisfying individual ambitions. Function lets community members work collaboratively and relationally, but without necessarily having the same individual; motivations or interpersonal agreements.

2.3 Advantages and obstacles of using Digital learning platforms instructional tools

Social media in education typically explores social media adoption and usage patterns, reasons for user adoption, attitude or preference, user experience, as well as their impact on performance (Hashim et al., 2018). Findings on social media's impact on performance are inconclusive; however, some point to positive influence (Lau, 2017), while others indicate negative influence (Kirschner & Karpinski, 2010; Paul et al., 2012). Typical advantages of social media in learning space include simplicity, availability, easy accessibility, ease of use, low costs, and quick feedback, which promote student interaction, engagement, and motivation (Ajjan & Hartshorne, 2008; Bexheti et al., 2014; Budianto & Arifani, 2021; Chen & Bryer, 2012; Damayanti & Sibarani, 2020; Dewangga et al., 2020; Febriani, 2020; Liu, 2010). Obstacles and challenges that hinder the further expansion of social media in education have also been investigated and reported, which include incompatibility or compatibility with pedagogical belief and practices, cognitive overload, distraction, privacy

and reliability of social media information (Ajjan & Hartshorne, 2008; Battrawi & Muhtaseb, 2010; Church & de Oliveira, 2013; Cooke, 2017; Schroeder et al., 2010).

"Despite the ubiquitous use of Digital learning platforms, only a few research studies have reported on its application for teaching and learning" (So, 2016, p.34). Digital learning platforms for learning has reported on Digital learning platforms usage patterns, attitudes, potential benefits, and challenges, most of which are similar to social media; for example, Digital learning platforms usage tends to be primarily for social than academic purposes (Yeboah & Ewur, 2014). Bansal and Joshi (2014) point out that students have positive attitudes towards Digital learning platforms, viewing it as a "valuable teaching method, a learning aid and as a highly personalised instructional medium". Digital learning platforms's other learning benefits include "immediate feedback to the problem, learning on the move, deeper clarity on issues, revision of previously learned topics, and the availability of learning materials all the time" (Bansal & Joshi, 2014, p. 5). Other aspects that users often appreciate include simplicity to use and easy accessibility (Bansal & Joshi, 2014; Bonsu et al., 2021; Damayanti & Sibarani, 2020; Gon & Rawekar, 2017; Li et al., 2019).

Moreover, using the application is cheap: its subscription was one dollar a year and then free since its corporation into Facebook, and its data consumption and usage are lower than other platform, including LMSs (Bouhnik & Deshen, 2014). Digital learning platforms enables collaboration and knowledge sharing (Yeboah & Ewur, 2014), increased interactivity (Bansal & Joshi, 2014,p. 6) as well as a community of learning (Igbafe & Anyanwu, 2018). Digital learning platforms's function that can support teaching and learning include messages, contacts, files, links, pictures, and voice notes sent individually or on Digital learning platforms groups (Ahad & Lim, 2014; Gon & Rawekar, 2017). Other advantages of Digital learning platforms are its ubiquity (enabling learning anytime and anywhere) and immediacy of content (Alsharif et al., 2020; Gon & Rawekar, 2017). Ahad & Lim's (2014) study reveals that students often use Digital learning platforms for "quick information retrieval and transfers", especially as a tool for their "group discussions and interaction" (p. 192)

Digital learning platforms's negative aspects are also similar to those generally applicable to social media, including distraction which leads to "addictive-like behaviours and the exposure to false unregulated information or media contents (Ahad & Lim, 2014). Yeboah & Ewur's (2014) study reviewed that students will spent more hours every day on Digital learning platforms, leading to less time on academic work and lower grades (Duke &

Montag, 2017). Moreover, Digital learning platforms group functions sometimes can cause "message flooding and time consumption" (Gon & Rawekar, 2017), which sometimes overwhelms both the instructors and students. One additional challenge is that some devices have small screens which cause eye fatigue (Annamalai, 2019; Gon & Rawekar, 2017).

2.4 Challenges faced by teachers when teaching Physics using Digital learning platforms

According to report by Edtech Hub (2019), challenges that inhibit the effective use of technology in education in Zimbabwe include limited power supply, financial resources for Edutech-related programs, low broadband, lack of equipment, coverage in rural areas, and a lack of awareness and skills in effectively integrating technology in teaching, to improve learning outcomes. In a related article by University World News, Zimbabwean National Union (ZINASU), the biggest student union, Secretary-general Tapiwanashe Chiriga raised some concerns which showed some challenges in using Digital learning platforms technology. He said that "as long as institutions continue to charge full fees and not provide data bundles for poor students, education will remain beyond the access by many students" and this exactly happens to most of learners at Regina Colei, Emmanuel,Nyanga Boys High,ST Marry's Magdalene high schools, Bonda.

Most of the studies conducted during the pandemic reported barriers in using Digital learning platforms in teaching and learning. In a technical aspect, Digital learning platforms is limited due to constraints such as slow-speed internet connectivity (Fujiono et al., 2021; Yulianawati et al., 2021) longer loading periods, vague learning instruction (Md Yunus et al., 2021). Technical limitations such as the lack of smart phones, signal towers and the costs to purchase quotas were also reported by Ubaedillah and Pratiwi (2021).

Some other major hindrance factors in learning digital are students' hailing from low-income family background (Lukas & Md Yunus, 2021), and eye strain by over-using technical appliances such as laptops and handphones (Gon & Rawekar, 2017). Research conducted by Gupta et al. (2021) proves that the age group significantly increases the risk of getting a higher computer vision syndrome (CVS) score among school children. As viewership and average time spent increases, complex eye and vision problems such as difficulty in focusing, eye pain, headache and blurred distance vision occur.

Besides that, the challenges of an overloaded curriculum with a lot of courses to handle at a time and the manual searching of old posts has made using Digital learning platforms a laborious process (Mwakapina et al., 2016). In that case, as teachers are expected to be available all the time pass their working hours (Gon & Rawekar, 2017), the ability to evaluate and give feedback for each and every student also becomes cumbersome for teachers.

Apart from feedback, teachers' presence is important in establishing a relationship with their students, whether synchronously or asynchronously. Rapanta et al. (2020) added that there are three main teacher presences: 1) cognitive, where a teacher takes into consideration students' readiness and willingness in participating in an digital class; 2) social, which refers to the communication between teachers and students; and 3) facilitator; which embodies teacher's resources and activities. Other than that, the most challenging part of transitioning from face-to-face to mobile learning is the difficulty in assessment.

Rapanta et al. (2020) also agreed that the continuous assessment model must be adapted to the current learning situation to avoid burn-out among teachers due to continuous engagement with students. In that sense, Maslan and Mohd Nor (2020) show that although the practicality is moderate, generally, there is a high feasibility in conducting the classroom-based assessment also known as Pentaksiran Bilik Darjah (PBD) by teachers in another district in Malaysia during the MCO.

On the other hand, Amin and Sundari's (2021) study revealed that all three digital learning platforms; Cisco WebEx Meeting, Google Classroom and Digital learning platforms received lowest scores in the impact at group-participants indicating face to face learning is still much preferred than fully digital and digitalised learning systems. Similarly, Darkwa and Antwi (2021) also stated that teachers' pedagogical knowledge is more effective in the classroom as compared to digital context. Furthermore, Darkwa and Antwi (2021) stated that teachers' presence is very much needed to help students with a more profound level of cognition.

Rahmadi (2020) also states that although students are active users of Digital learning platforms in real life, the situation is reversed in a learning circle. They are passive, unprepared to learn actively, cooperatively and independently via Digital learning platforms. Students who read the reading materials given before class and those who reread materials after class are very less. Majority does not answer or ask questions in the Digital learning platforms group. Similarly, Akyıldız and Çelik (2021) also added that students tend to be active individually but lack collaborative learning among peers. Students who are active in

Digital learning platforms discussions also consist of those high-performing ones as compared to low-performers who are mostly quiet.

Digital learning platforms groups also create the issue of students being distracted, the tendency to copy and paste their friend's work as well as limited time in conducting lessons (Niah, 2021) due to mobile fatigue. Wahyuni et al. (2020) further assert that the lack of comprehensive explanation of teachers makes it harder for students to understand the materials given, as some students prefer listening and not reading the materials to understand. Furthermore, other research also found out there are confusion in using the right tenses and vocabularies when answering reading questions (Susanti, 2020) as well as lexical richness, misspellings and non-standard orthographic details (Verheijen & Spooren, 2021).

Moreover, there is evidence that students lose motivation and focus after some weeks of digital learning indicating low productivity and low achievement in the ESL reading lessons (Yulianawati et al., 2021). The research further pointed out that students mostly stayed in lower order of thinking (LOTS) such as expressing opinions on a reading question instead higher order of thinking (HOTS) such as providing examples or elaborating more on certain topics. The following are also challenges which can be described under the following headings

Resistance to shift to distance education

Traditional distance education, characterised by limited access to information resources, had confined students to their homes forcing them to learn without communication with teachers or peers (Bates, 2019; Guri-Rosenbblit, 2014). This poses the question as to whether the distance learning of today is any different. Internet technologies that are used for digital learning has blurred the distinction between distance and traditional learning by merging the two forms of learning. This blurring of boundaries between the two forms of education has created a predicament as to what constitutes distance learning (Guri-Rosenbblit, 2014). However, distance learning is also confused with other parallels, for instance digital learning, remote instruction, e-learning and virtual learning which has further blurred the issue (Traxler, 2018). In the current context, distance learning can be defined as the form of education that effectively utilises a wide range of tools and technology to deliver instruction and materials, uses new digital distance pedagogies to augment the student learning experience and facilitates student-teacher and student-student communication (Starkey et al., 2021).

Recent studies has examined distance learning in different countries reveals how technology mediates the role of teachers and the students in the process of instruction and learning (Starley et al.,2021; Greenhow, Lewin & Staudt Willet, 2020). Distance or digital learning has not only paved the way of constructivism but has also become a key contributing factor for the emergence of new pedagogies (Bates, 2019). Therefore, educational institutions world over are using new technologies and pedagogies with the belief that digital has the potential to overcome the inadequacies of traditional distance learning (Dhawan, 2020), for instance, by providing interaction between the students and their teachers or peers, by providing easy access to unlimited resources such e-books, journal articles and other digital information resources. However, it has been observed that educators faced many challenges as they had to move everything digital hastily (Ferr et al., 2020; Kraft & Simon, 2020).

Moving everything digital put burden to the educators

In the context of the health threat caused by the pandemic, educational institutions have tuned to distance learning as the only way of ensuring the continuity of education. This unexpected and abrupt move to the emergency distance instruction has created considerable challenges for teachers and reduced the extent to which students can engage in learning (Hew et al., 2020; Kraft & Simon, 2020). Teachers are finding it difficult to balance their work and personal life during the pandemic, for instance responding to students' academic, physical and emotional needs, as well as rapidly planning instruction to embrace the constantly changing situation (Jones & Kessler, 2020). Time is crucial for planning, designing, using and improving educational programmes.

The problem of passive learners

Other studies have demonstrated that digital distance learning can only be effective if the students are methodical and orderly, determined and focused (Brown, 2019). Recent research shows that students are passive and resist new experiences, have low self-confidence, are unable to interact appropriately with their peers, have problems interacting with teachers, have attention difficulties, are easily distracted and lack motivation and self-discipline (Winter et al., 2021). Such challenges are mainly related to the lack of human interaction between teachers and students (Rudnick, 2020). Social isolation and lack of interactivity are major shortcomings of emergency of remote teaching (Dong et al., 2020). Lack of interaction with peers, friends, classmates, and teachers can have a negative psychological effect (Brazendale et al., 2017). Interaction is crucial for acquiring the knowledge for navigating

through various technological and pedagogical tools (Carmo & Franco, 2019). Students are less likely to engage in distance learning activities regularly because of lack of non-vocal elements of non-verbal communication or body language and psychological impacts such as longer durations of quarantine, fears of infection, frustration and boredom, inadequate information, financial loss, and stigma (Brooks et al., 2020; Kraft & Simon, 2020; Carmo & Franco, 2019).

Therefore, maintaining meaningful engagement or encouraging all students to participate in on digital activities at the same time can be a challenge. In order to address this social social-level challenge, schools will have to focus not only on "delievering educational materials to children, but offering an opportunity for students to interact with teachers and obtain psychological counselling" (Wang et al., 2020). Teachers can play a vital role by connecting with students and providing psychological support for students who are at a higher risk of depression due to isolation from their teachers and colleagues and by developing a sense of community (Scull et al., 2020; Berry, 2019).

Rahmadi (2020) also states that although students are active users of Digital learning platforms in real life, the situation is reversed in a learning circle. They are passive, unprepared to learn actively, cooperatively and independently via Digital learning platforms. Students who read the reading materials given before class and those who reread materials after class are very less. Majority does not answer or ask questions in the Digital learning platforms group. Similarly, Akyildiz and Celik (2021) also added that students tend to be active individually but lack collaborative learning peers.

The challenge of lack of teacher presence

The physical separation between students and instructors is claimed to result in a psychological-communication gap or lead to transactional distance creating a sense of danger, frustration, or students' misunderstanding about themselves and about the learning process (Moore, 1993 cited in Zika, Cohen & Rahimi, 2018). Teacher's social presence can encourage meaningful communication; create a climate of cooperation and public discourse through feedback (Zika et al., 2018). According to Poth (2018) an individual's social presence with the learning environment may not only promote a more engaging and supportive educational experience but also motivate students. Thus, social presence is a "critical effective component" and "one of the more important constructs in determining the level of interaction and effectiveness of learning in an digital environment" (Mykota, 2017, p.

137). Dialogue between students and teachers as well as support for learners and their needs may increase students' sense of social presence. This requires teachers to actively partake in the discussion to encourage students' participation (Zika et al., 2018). However, establishing and maintaining a 'presence' digital as depicted by Garrison (2017) is not easy when lockdowns are in place.

Lack of preparedness of teachers

Social distancing and lockdowns have significantly disturbed traditional educational practices, but teachers are continuing to rely on traditional teaching pedagogies when delivering instruction in the distance learning environment (Pokhrel & Chhetri, 2021). Some of the challenges facing teachers are spending a considerable amount of time on familiarising with Digital learning platforms, using new approaches, for example, organising virtual teaching related activities, virtual meetings and group discussions to engage with students (Cavanaugh & DeWeese, 2020; Scull et al., 2020). This suggests that teacher preparedness continues to be an issue across most contexts (Howard et al., 2020). One of the requirements for teachers in the situation they are in today is to adapt to the new teaching environment. Adaptability here refers to the potential of the teachers to adjust their pscho-behavioural mechanism to cope with changes and uncertainties (Collie & Martin, 2017). It is claimed to comprise three dimensions, namely behaviour adjustment, emotional adaptation, and change in mindset (Collie et al., 2018).

The quick move to emergency remote teaching has frustrated teachers who were unable to decipher how to use digital tools, digital resources, and apps for distance education. In other words, the educators were used to conventional teaching delivery and were obliged to embrace technology although they were not prepared for this sudden shift to teaching remotely (Barrot, Llenares, & del Rosario, 2021; Winter et al., 2021). Skills, knowledge, and competencies are required for digital teaching and teachers must know how and when to use technology appropriately (Winter et al., 2021). Previous studies have highlighted that teachers must believe in the use of technology and are willing to use it in their daily practice (Ertmer, 2005; Tondeur et al., 2017). Overall, the technological challenges are mainly related to teacher digital competence (Ferri et al., 2020).

Teachers' pedagogical orientation is another challenge. Researchers have argued that shaping a teachers' pedagogical orientation involves fundamentally changing the role of the teacher from that of sage-on the-stage to that of a guide-on-the-side (Tarling & Ng'ambi, 2016).

However, in distance learning environments, teachers' pedagogical orientation must align with their technological competence (Carno & Franco, 2019). The pedagogical challenges are principally associated with teachers' lack of digital skills and lack social and cognitive presence or the ability to construct meaning through sustained communication within a community of inquiry (Ferri et al., 2020).

Technology is increasing being used not only to deliver instruction, but also to support and assist learners and to assess students in innovative ways , for example using analytics to assess the quality and practicality of digital resources and track student involvement in digital activities (Martin & Ndoye, 2016). However, aligning pedagogy, content, assessment, and appropriate use of technologies, and digital strategies is a challenge especially in distance education (Zhang et al., 2020). Assessing students during a pandemic is even more challenging. A recent study from Kuwait fund that summative assessements are still being used to assess final examinations and also used as an evaluation tool for curriculum, teacher performance, and school performance (Alhashem & Agha, 2020). Another study from the Middle East found that the main challenges of remote assessment were academic dishonesty, infrastructure, and commitment of students to submit assessments (Guangul et al., 2020). These results suggest that the recent return to distance education has exposed the lack of preparedness of teachers in Kuwait to formatively assess students.

2.5 Related digital platforms which complement Digital learning platforms

In the educational setting, technological tools are among the resources most used by the teachers to facilitate Physics learning students (Eady and Lockyer, 2013). Digital devices, software, and learning platforms offer a range of options to give support for teaching of Physics (Herold, 2016). Kuss et al. (2019) sought to find the applications for devices that might be suitable for supporting the teaching –learning process.

Among the technological tools for teaching, there are videoconferencing tools such as Google Meet, Skype and Zoom. Kumar et al. (2015) showed that videoconferencing tools to remote teaching provide a real-time interaction, enabling feedback and providing student-centered engagement. Considering teaching in time of pandemic, the videoconferencing tools adopted in the ERT become more relevant since these tools are widely used to carry synchronous and remote classes (Singh & Awasthi, 2020). Singh and Awasthi (2020) carried out a comparative study of several videoconferencing platforms to highlight their advantages and

disadvantages. These tools have features that increase users' control and security regarding the advantages. For example, Zoom can disable the participant's screen sharing, and Google Meet maintains control over the user's data.

The adoption of videoconferencing tools that support teaching is not trivial. As pointed out by Knapp (2018), one of the difficulties of digital teaching is the lack of interactivity between the teacher and students and the lack of face-to-face contact. She also mentioned that the feeling of isolation and lack of motivation that students from digital courses. Vandenberg and Magnuson (2021) compared the attitudes towards the use of Zoom for remote teaching of students. The data collected through a Likert scale survey, indicate that students' attitudes towards the remote classroom experience were immensely negative, mentioning psychological barriers such as stress and anxiety.

However, there are positive effects regarding videoconferencing tools in remote teaching. Al-Marrof et al. (2020) assert that digital classes application's effectiveness is highly dependent on the adoption of technology as means of remote teaching. The study investigates the impact of Google meet in the context of the Covid-19 pandemic and the importance of choosing an effective and appropriate technology that reduces the fear factor (uncertainties and anxieties that the pandemic caused in students) during remote educational processes. Their results found that student's usefulness and ease of use significantly affect the acceptance of the chosen tool, reducing the fear factor and encouraging students to attend scheduled classes.

While illustrating the use of videoconferencing tools, Maher (2020) shows two projects that can successfully support digital teaching and learning. In the first project, videoconferencing tools (Skype and Zoom) were used to support classes for hospitalised K-12 students. The second project used these tools with the students adopting remote teaching model due Covid-19 restrictions. The results indicated that videoconferencing allowed informal group interactions, such as games and conversations during class breaks, helping teachers and students establish social relationships.

2.6 Chapter summary

The chapter focuses on literature review on teaching Physics using digital tools. The main reason for this chapter is to collect relevant information, provide a foundation of knowledge on teaching Physics using digital tools, identify research gaps scrutinised initially are further explored to establish the latest facts of theories to add value and compare with previous findings. In addition, the chapter ensures that the researcher have a thorough understanding of

the topic in study. Moreso, relevant literature on teaching Physics was reviewed by different scholars. The aim of review was to provide the basic principles on teaching Physics using digital tools and how quality education will be initiated by digital tools. The next chapter is research methodology and this chapter will focus on research paradigm, research design, data collections, data analysis, credibility, validity, reliability and ethical considerations.

CHAPTER 3.0: METHODOLOGY

3.1: Introduction

This chapter looks at the research paradigm, research design, and research methodology, population, sampling and sampling technique, research instruments, data presentation and analysis

3.2.Research paradigm

A research paradigm is a set of common beliefs and agreements shared among experts within a discipline about how problems should be understood and addressed (Schwandt, 2001).There are many research designs which the researcher could have chosen but he adopted a mixed method research paradigm. The researcher adopted this research design because it draws on benefits of each type of research: quantitative research can answer questions about breadth-how many, to what extent, how often-while qualitative research can provide depth, answering questions on the why and how. I think mixed paradigm is the best of best because it combines paradigms, allowing investigation from both the inductive and deductive perspertives, and consequently enabling researchers to combine theory generation and hyporesearch study testing within a single study (Jogulu & Pansiri, 2011).

3.3. Research design

Research design is a framework of the research study (Choga & Njaya, 2011). Creswell, (2014) states that research designs are a specific procedure which involves data collection, data analysis, and report writing. The researcher adopted a case study research design because it is effective ways to get learners to practically apply their skills and their understanding of learned facts of Physics to a real-world situation. From my own point of view, I think case study is the most flexible of all research designs, allowing the researcher to retain the holistic characteristics of real-life events while investigating empirical events.

3.3. Ethical considerations

Ethical considerations in research are a set of principles that guide your research designs and practices. These principles include voluntary participation, informed consent, anonymity, confidentiality, potential harm and results communication. The researcher adopted ethical considerations because it contains research ethics that govern the standards of conduct for scientific researcher. I think ethical considerations are important to adhere to ethical principles in order to protect the dignity, rights and welfare of research participants.

3.4 . Population

Lux (2015) defines population as the entire group from which subjects are drawn and all possible areas of interest in the study. The population was made up of Ordinary level physics teachers and learners in secondary schools in Nyanga District. This population was selected for this research because these teachers and learners were doing Physics and they knew the challenges they were facing, during teaching and learning of Physics via Digital learning platforms. I think that population was suitable for my research because Physics they provided useful information required for this study.

3.5. Sample (definition and justification)

The teachers and learners at David girls high made up the sample of participants in the study. A population sample is important in this study because, it reduce the costs of buying paper for printing questionnaires; reduce time spent and effort made in collecting and analysing data (Saunders et al.2009). In addition, sampling deals with less data and hence this ensures accuracy on information on challenges they were facing during digital learning and hence reduces possible errors. More so, sample of Physics students avoid unnecessary data saturation that is a situation where more data does not necessarily lead to more information (Mason, 2010).

i. Sampling technique(definition, reason and justification)

3.6. Sampling is a method that allows researchers to infer information about a population based on results from a subset of the population, without having to investigate every individual (Sounders, 2014). . The participating District and the St David School was chosen by convenience sampling. The school is close to where the researcher works. This

greatly reduced the research costs and improved the effectiveness of the researcher in collecting the relevant data. This also improved the reliability of the research findings. All teachers were selected using purposive sampling and learners were selected in the school using random sampling.

Purposive sampling refer to choosing individuals who can provide deep, rich, significant data on challenges of teaching Physics using Digital learning platforms (Oliver, 2010; Saunders, et al. 2009).The researcher handpicks the sample on his or her judgement of knowledge expertise in Digital learning platforms of the individuals chosen (Sounders, 2014). The chosen individuals will be vocal, articulate, and forthcoming. The reason for adopting purposive strategy are based on the assumption that, given the aims, specific kinds of people may hold different views about the ideas and issues at question (Mason, 2002;Robinson,2014)

In this study, non-probability sampling methods like convenience or accidental sampling and purposive sampling were used. Non-probability sampling refers to technique in which not every student of the population has an equal chance of being selected. Indeed, some units or cases of the population have zero chance of selection (Bhattacherjee, 2012). A sampling technique targets certain individual (Magwa & Magwa, 2015). The technique is usually used when generalisation to the population is not the major issue (Magwa & Magwa, 2015).

Accidental sampling chooses cases which are easily accessible to the researcher (Castillo, 2009). Choosing the nearest individuals until the required sample size has been obtained (Magwa & Magwa, 2015). For example a researcher wishing to find the effects of teaching Physics digital would just pick on the student he or she comes across until the required sample size. During an investigation of challenges of using Digital learning platforms, I think it was best to adapt this technique for testing as part of hyporesearch study generation, getting 'sense' of opinions or as an initial pilot before further research.

3.7. Trustworthiness

Trustworthiness of a study refers to the degree of confidence in data, interpretation, and methods used to ensure the quality of a study (Pilot & Beck, 2014). The researcher adopted trustworthiness in research because it makes it rational for people to accept research finding-

to build future research upon them, to utilise them to inform the public policy, and to use them to guide individual choice and community action.

3.8 . Validity and reliability

Reliability refers to the consistency of a measure whether the results can be produced under the same conditions. Validity refers to the accuracy of a measure. The researcher adopted reliability and validity because he wanted to insure that data are sound and replicable, and the results are accurate (Kimberlin & Winterstein, 2015).

3.9. Research instruments

Mlead (2014) defines research instruments as study tools used to gather data.Interview guide, observation schedule and questionnaire were used to investigate the challenges faced by teachers in using Digital learning platforms learning. Generally, the researcher adopted various instruments because it can reduce data collection time and providing accurate results for the research purpose. During an investigation into challenges faced by teacher in using Digital learning platforms as a teaching method, interview guide, observation schedule and questionnaires were used to gather data at St David Girls High.

3.9.1. Interview guide

An interview guide is a document that enables organisations to structure the way they conduct their interviews. The researcher adopted an interview guide because it helped the interviewer to know what to ask about and in what order and it ensured a candidate experience that was same for all student Physics learners. My opinion, I think using interview guide helped the researcher to explain challenges faced on Digital learning platforms, gain a better understanding and to explore research subjects' opinions, behaviour, experiences, and phenomenon

Observation schedule

An observation guide is a research tool that offers an investigator an opportunity to gather first-hand data from naturally occurring social situations (Cohen, 2007). Observation guide was used to address the requirements of main research question 1 which reads "How effective is teaching of Physics digital at Ordinary level?" The respondents were observed as they respond to this question on both questionnaires and interviews. I think it was good to adopt observation schedule because the observation grid not ensures that the principal issues and components were captured but also

encouraged the observer to reflect on each aspect of their observations and identified the particular ways the observer was influencing.

3.9.2. Questionnaire

Masuku (2006) defines a questionnaire as a document consists of questions to solicit information useful for analysis. The researcher adopted questionnaires because they offered a fast, efficient and inexpensive means of gathering large amounts of information from sizeable sample volumes. The researcher designed a questionnaire for Physics students with both the open and closed questions since he was using mixed approach. In this study, the researcher distributed questionnaires physically to all the four Physics classes. Despite the limited depth information given by respondents, questionnaires remained useful because it saves time of researcher.

3.10. Data collection procedure

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions (Edber, 2018). Firstly, the researcher sought permission from the school head of Regina Colei, Emmanuel,Nyanga Boys High,ST Marry's Magdalene high schools. The researcher adopted data collection procedure because the methods were important because how the information collected was used and what explanations it can generated were determined by methodology and analytical approach applied by the researcher.

3.11. Data presentation and analysis

Data presentation is a process of comparing two or more data set with visual (Zikmund et al., 2013). The researcher adopted data presentation like tables and bar graphs. Zikmund et al. (2013) explain the stages of data analysis of raw data as editing, coding and creating an electronic data file. Editing refers to the checking of data with the purpose of adjusting data for correctness, consistency and legibility. Coding is used to represent the meaning of data. Data presentation follows data analysis and helps to organise information by visualising and putting it into a more readable format.

3.12. SUMMARY

Chapter 3 focused on the research design and methodology. It clearly outlined the research paradigm, research approach and the research design which was used. The chapter also highlighted the population, sample, sampling techniques, data collection, and data collection procedures and data analysis methods. In addition, the chapter further explored validity and reliability and then ethical considerations. The next chapter focuses on data presentation, analysis and discussion.

CHAPTER 4.0: DATA PRESENTATION, ANALYSIS AND DISCUSION

4.1 Introduction

This chapter focuses on data presentation, analysis and discussion. In this chapter, data is presented, analysed and discussed with respect to the following headings. A summary of the chapter will be given at the end.

Table 4.1 showing number of Physics learners who participated

Class	Number
Form 3	60
Form 4	60
Total	120

The table 4.1 shows the number of respondents in form 3 and 4. The learners were equally selected to reduce disparities among female students and avoiding favouritism. A population sample constituted 120 learners, the sample constitutes 60% of the total population under the study (N=200). A population sample is important in this study because, it reduce the costs of buying paper for printing questionnaires; reduce time spent and effort made in collecting and analysing data (Saunders et al.2009). In addition, sampling deals with less data and hence this ensures accuracy on information on challenges they were facing during digital learning and hence reduces possible errors. Moreso, sample of Physics students avoid unnecessary data saturation that is a situation where more data does not necessarily lead to more information (Mason, 2010).

Table 4.2 Qualifications of Physics teachers

Qualifications	No. of male teachers	No. of female teachers
Diploma	2	0
Bachelor's Degree	0	1
Master's Degree	1	0
Other	0	0
Total	3	1

The table 4.2 above shows the highest level of qualifications of respondents (Physics teachers). From the table above, Physics department is dominated by 3 male teachers and 1 female teacher holding a Bachelor's degree in Physics education. The data collected also shows that the high schools have well skilled teachers A specified method of purposive sampling; homogeneous sampling, was used (Etikan et al., 2016). As this study aims to investigate the challenges of using Digital learning platforms in teaching ordinary level Physics in high schools Nyanga, participants are chosen based on; 1) Physics lesson is conducted via Digital learning platforms; 2) Digital learning platforms is used as the main teaching and learning tool; and 3) Calculations of optics, wave motion and mechanical structures problems are communicated via Digital learning platforms as well. The number of respondents was 124 (4 Physics teachers and 120 learners) and the return responses from the survey were 119 (96%). This is in line with Fincham (2008) who highlighted that response rates approximating 60% must be the goal of researchers.

4.2 Different platforms used for teaching Physics

Participants shared a wide range of digital learning tools they used to deliver lessons and assessing students' achievements. Regarding to research questions and research objectives, Physics teachers and learners outlined major platforms they used to conduct digital learning.

Figure 1 below shows major platforms used in different schools specifically Regina Colei, Emmanuel,Nyanga Boys High,ST Marry's Magdalene high schools.

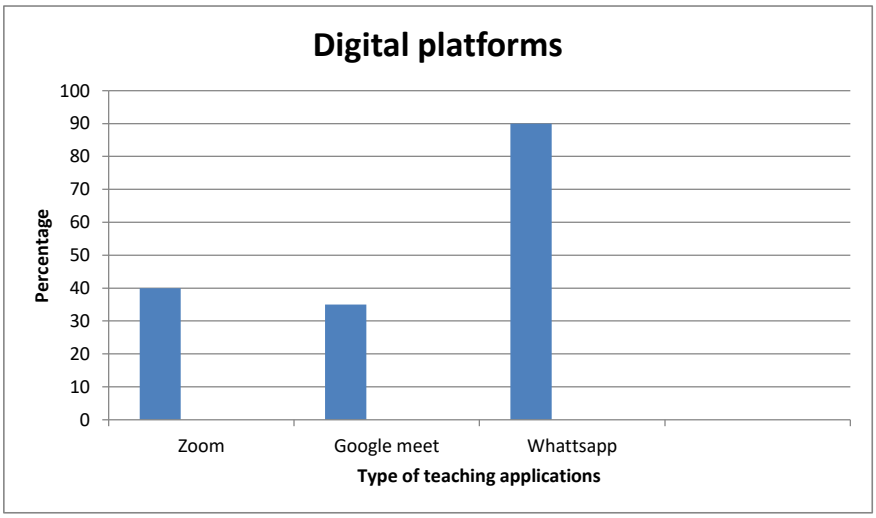

Figure 1: Types of different platforms used in teaching.

Figure 1 above reveals that Physics teachers tend to use digital platforms such as Zoom, Google meet and Digital learning platforms to deliver their digital lessons. Google meet stood by 35% followed by Zoom with 40% and the majority of respondents preferred Digital learning platforms (90%) to conduct their lessons. Despite its highest percentage, the respondents faced so many challenges during holiday lessons and Physics teachers were complaining of poor students' participation. Rahmadi (2020) also states that although 90% of students as highlighted on Figure 1 are active users of Digital learning platforms in real life, the situation is reversed in a learning circle.They are passive, unprepared to learn actively, cooperatively and independently via Digital learning platforms. Similarly, Akyıldız and Çelik (2021) also added that students tend to be active individually but lack collaborative learning among peers.

4.3 Technical challenges of using Digital learning platforms in Physics instruction

The challenges of using Digital learning platforms in teaching of Physics are technical and pedagogical challenges.

Table 4.3 shows the descriptive analysis of the technical challenges in teaching Physics concepts such as waves and optics via Digital learning platforms. 51% respondents also strongly agreed to conditions such as eye- and neck-strain by using Digital learning platforms compatible appliances such as laptops, hand phones and tablets for more than 3 hours per day to teach Physics concepts. Gupta et al. (2021) shows the prevalence of digital eye strain as an impact from the upsurge of digital device exposure among school children. Exploring further, 54% of respondents strongly agreed that they were informed about their students' condition at home whereby there were many of them without a personal handphone or those who share handphones with their siblings at home. This is consistent with Lukas and Md Yunus (2021) who reported on low-income families facing financial adversity.

Table 4.3 showing technical challenges of using Digital learning platforms in teaching Physics

Technical challenge	Strongly Agree	Disagree	Neutral	Strongly disagree	Agree
No smart phone	25%	1%	0%	4%	10%
Digital eye strain	51%	2%	1%	20%	15%
Share phone with parents	54%	3%	7%	15%	21%
Personal phones	75%	2%	1%	2%	15%
Slow internet	70%	1%	0%	15%	14%
Downloading lessons	80%	7%	3%	1%	9%
Time consuming	15%	7%	1%	8%	69%
Consume data	70%	8%	2%	9%	10%

75% of respondents had personal smart phones but 80% of them had problem in downloading lecture notes, documents and other learning materials. Further, the data revealed that 69% agree on time consuming since the sending of documents requires strong internet or Wifi. Therefore, the use of Digital learning platforms in teaching Physics is a challenge to many teachers. However, Asmara (2020) noted that one of the weaknesses of Digital learning platforms is the inability to check on each every student in the Digital learning platforms group. Students' reply and response to

teacher's messages and instructions seem to be the only way to check their presence in the class. Response from teachers, 70% were complaining of slow internet and hence time consuming on sending learning materials.

4.4. Challenges faced by Teachers faced by teachers in teaching Ordinary Physics

The table 4.4 involved seven items representing the challenges faced by teachers whilst using Digital learning platforms to teach Physics concepts. Further, 55% of learners strongly agree on confusion on calculations highlighted by instructors. The present study conducted by Darkwa and Antwi (2021)'s research whereby teachers' pedagogical content knowledge is more aligned towards teaching in the classroom as compared to digital learning. This includes mobile learning as well. In the classroom, teacher's model, demonstrate, explain and ask—essentially scaffolds—students for them to learn and perform (Rapanta et al., 2020) in the classroom. However, this does not happen quite naturally in the digital setting, especially in mobile learning situations whereby different students learn at different pace and times.

Table 4.4 showing challenges faced by teachers when using Digital learning platforms in teaching ordinary Physics.

Methodological Challenges	Strongly Agree	Disagree	Agree	Strongly disagree
Confusion on calculation	55%	3%	12%	5%
Lack of illustration	75%	5%	10%	4%
Difficult to identify student's mastery	65%	12%	10%	4%
Lack of classroom Management	70%	4%	10%	12%
Students coping their friend's work	45%	7%	3%	45%

75% of learners agreed on lack demonstration and illustrations on problems of Physics. Without teacher's visibility in class demonstrating difficult Physics problems, students tend to be demotivated in the long run (Rahmadi, 2020). Besides, 45% of respondents agreed to the problem of coping and pasting of friend's work.

4.5 Respondents' digital learning facilities: The great challenge

To learn digital, respondents must have the correct facilities – namely a smart phone, computer device and internet access. This is the first challenge to solve in order to facilitate digital learning. Table 4.5 presents information about the digital learning facilities that respondents owned. The data indicate that 25% of respondents (N=30) had strong Wifi access, but that 67% (N=80) had a limited internet connection or a weak signal. This is likely

to be due to the geographical location and limited number of towers. Meanwhile, 14% of participants (N=17) had limited internet access due to its cost, and they could not afford to buy data bundle. This could be due to poor family backgrounds.

Table 4.5 Challenges associated with digital facilities

No.	Item	Frequency	Total %
Digital learning challenges: internet access at home			
1.	Strong Wifi	30	25%
2.	3G or 4G smartphone data line	60	50%
3.	None	30	25%
Digital learning challenges: computer facilities			
4.	Own laptop	24	20%
5.	Use family	58	48%
6.	None	26	22%
Digital learning challenges: cell phone facilitity			
7.	Own smartphone	78	65%
8.	Use with siblings	24	20%
9.	Ordinary cell phone (without Digital learning platforms)	4	5%
10.	None	4	5%
Digital learning challenges: limited internet access for the following reasons.			
11.	Remote rural areas	12	10%
12.	Internet access limitations or poor signals	80	67%
13.	High bundle cost	17	14%
14.	Other reasons	11	9%

The data in table 4.5 above also indicate that 25% of students (N=30) did not have internet access at home, and 22% (N=26) did not have computer facilities at home. Only 20% (N=24) had their own personal computer and 48% (N=58) shared computers with their family members. Most respondents had their own smart phone device (65%, N=78), while 20% (N=24) shared smart phones with their siblings. By contrast, only 5% (N=4) of participants did not have smart phones, but the majority were likely to use smart phones for digital learning. Within the data concerning the majority of respondents aged 15- 16 owned either a smart phone or a personal computer at home. This enabled them to undertake Physics digital lessons.

4.6 Supplementary data gathered from Physics learners' questionnaires

Question 1: What are the problems encountered by Ordinary level Physics learners during their holiday digital lessons?

60% of the respondents from the questionnaires (N=200) claimed that audios and documents were difficult to download and hence they took so many hours to download it. Also, 20% of learners were complaining of erratic power cuts which resulted on their phone batteries going flat. Further, 5% of respondents claimed that their parents due to economic hardship did not manage to purchase them enough data bundle for digital lessons.

Question 2: What can be done to reduce problems encountered by learners during learning using digital platforms?

90 percent of form 3s and 4s were suggesting that the teacher should notify their parents concerning the holiday lessons, so that the parents will be aware and budgeted money for buying enough data bundle for lessons. More so, learners were proposing that the administration should engage their parents and encourage them to buy private internet routers specifically for studying purposes. Further, 75% of learners were suggesting that the teacher should send short audios and document with small gigabytes as this would become easy for them to download it.

Question 3: What are your views and comments concerning learning via Digital learning platforms?

Quotes from 100 respondents, learning via Digital learning platforms is absolutely perfect because they cover much syllabus contents within short period of time. Further, learners compared syllabus coverage to normal school hours and they said that during normal hours they were so many disturbing extra curricula activities which disturb learning of Physics. Therefore, the students commend Digital learning platforms as the best teaching methods to use the ever changing world.

4.7 Supplementary data gathered from Physics teacher's interviews

Question 1: What are the challenges faced by Physics teachers in High schools in Nyanga district when using Digital learning platforms in the teaching of Physics at Ordinary level?

Below are some challenges which the respondents claim that they meet when using Digital learning platforms in the teaching and learning of ordinary Physics in secondary schools in Nyanga District.

- Face too much resistance from the administration.
- Face resistance to change by some other members of the science department to turn into new ways of teaching Physics.
- Domination of institutional memories by long serving teachers who used out dated instructional methods to deliver their lessons.
- Laborious marking of student scripts since learners had to send their work to your inbox and as a teacher you need to download it and remarks and resend back to the student.
- Lack of classroom management since learners will be doing digital.

Commented [E M1]: Explain

From this information, it can be noted that Physics teachers are facing challenges from teaching via Digital learning platforms. Domination of institutional memories will cause long serving members to resist the new digital teaching methods. Teachers claim that students were indiscipline and other learners appeared to be digital yet they are watching movies.

Further, the lack of classroom management will be the greater problem of Digital learning platforms application.

Question 2: What are the suggested solutions to challenges mentioned in question 2?

For resistance from school administration, the respondents suggested that these people need to be educated on the importance of syllabus coverage and how it improves the pass rates of learners. Both members of the science department and those with institutional memories need to be staff developed by resources person so that they can adapt to new methods of teaching than adapting to old teaching methods. For lack of management, the respondents will include parent in Digital learning platforms group so that they can monitor the work for their students.

4.8 Discussions

The majority of Physics respondents expressed that they were qualified, confident and comfortable using computers, and smart phones, during their digital learning sessions. As explained in the Theory of Planned Behaviour, Ajzen (2002) justified that perceived behavioural control which is contributed by the perceived ease to use and perceived usefulness (Davis, 1989) have helped to develop a sense of confidence and comfort for these students to use the electronic communication equipment.

Even though a number of Physics students shared the gadgets with their siblings and other family members, they were still able to adapt and learn. Again, the exposure and familiarity to the gadgets from their surroundings have helped to shape their behaviour to use the electronic communication equipment for learning (Ajzen, 2002). As a result, the students were still able to participate and develop their knowledge and skills in using technology for digital learning.

On the other hand, even though digital learning is found as a suitable method of learning in this current situation (Ariffin et al., 2020; Duff, 2008; Hussin, 2017; Pusvyta Sari, 2015; Raheim, 2020; Samat et al., 2020), the findings indicated that only a small percentage of

respondents felt they benefitted from digital learning, and agreed that digital learning did not motivate them to enjoy learning. Instead, they preferred conventional classroom methods. Hazwani et al. (2020) similarly found that students' motivation during digital learning was low as this learning required students to be selfmotivated and independent in their learning. In Samat et al.'s (2020) study, they found that intrinsic motivation is a predictor of student's intention to use digital learning. Therefore, Physics teachers should play an important role in designing learning that is engaging and interesting for students via Digital learning platforms.

In this current study Physics students' learning was affected by limited internet access because of poor infrastructure, geographical location and the high costs of internet packages. Most respondents noted that they did not have stable internet access and were unable to participate, download videos, audios and lecture notes in class. We believe that respondents' place of residence (urban vs. rural) may explain some of these issues, as almost 40% of respondents live in rural areas where there is no signal towers and erratic power cuts. Facilitating conditions are undoubtedly pivotal to students' learning motivation (Rahiem, 2020; Samat et al., 2020). With such challenges faced by these students, it was not surprising that their learning motivation was found to be 'low'.

Further, key findings are technological and pedagogical challenges, lack of professional development and overcoming challenges. Frequency analysis indicated that seasoned teachers were not happy with making the transition to distance learning. Although, they felt that they received support to implement or make the shift to distance learning there were a sizeable number of neutral responses which negated their perceptions. One of the key findings was that distance learning impacted their instruction and student engagement. However, it is evident from the surveys that most Physics teachers had selected the neutral option than report their actual opinion. The researchers in this study argue that the participants may have chosen a neutral option as they may not be satisfied with distance learning or because they wanted to avoid negative feeling or were reluctant to voice a socially undesirable opinion (Edwards & Smith, 2016). Since there were many neutral responses, more probes were used during the interviews that followed the survey.

After reviewing all interview data, several themes emerged within challenges which are not very identical to the survey results. The interviewees listed many challenges from both teachers' and students' perspectives. The technological challenges were primarily related to a lack of technological knowledge and skills to teach and learn in a distance learning

environment. A key fact from the findings of the study was the lack of preparedness of the teachers and their sense of adaptability. This is in line with a previous study (Collie & Martin, 2018) which emphasizes that teachers with better adaptability were more likely to feel better about distance education. Overall, it is apparent that the teachers were not aware of the significance of technology and teacher presence which are crucial in creating a community of inquiry (Garrison, 2017).

Furthermore, 75% of respondents had personal smart phones but 80% of them had problem in downloading lecture notes, documents and other learning materials. Further, the data revealed that 69% agree on time consuming since the sending of documents requires strong internet or Wifi. Therefore, the use of Digital learning platforms in teaching Physics is a challenge to many teachers. However, Asmara (2020) noted that one of the weaknesses of Digital learning platforms is the inability to check on each every student in the Digital learning platforms group. Students' reply and response to teacher's messages and instructions seem to be the only way to check their presence in the class. Response from teachers, 70% were complaining of slow internet and hence time consuming on sending learning materials.

Results revealed that Google meet stood by 35% followed by Zoom with 40% and the majority of respondent's preferred Digital learning platforms (90%) to conduct their lessons. Despite its highest percentage, the respondents faced so many challenges during holiday lessons and Physics teachers were complaining of poor students' participation. Rahmadi (2020) also states that although 90% of students as highlighted on Figure 1 are active users of Digital learning platforms in real life, the situation is reversed in a learning circle. They are passive, unprepared to learn actively, cooperatively and independently via Digital learning platforms. Similarly, Akyıldız and Çelik (2021) also added that students tend to be active individually but lack collaborative learning among peers.

4.9 Chapter Summary

The chapter focused on data presentation, analysis and discussion. Research findings indicate that weak internet, high bundle cost, low motivation, technical and pedagogical challenges are major problems of learning via Digital learning platforms. Data was presented in the form

of tables and graphs and analysed qualitatively and quantitatively respectively. The following chapter presents summary, conclusions and recommendations.

CHAPTER 5.0: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter outlines the recommendations based on the challenges faced by teachers in high schools in Nyanga District when using Digital learning platforms as an instructional tool in teaching and learning of Physics at Ordinary level. It also focuses on summary of findings, conclusions and recommendations of the study.

5.2 Summary

The study was on investigating the challenges faced by teachers when using Digital learning platforms in the teaching and learning of Physics. The researcher used open ended interviews, questionnaires and observations to solicit information from the teachers and learners. Four Physics teachers and two hundred Physics students from 3C, 3E, 4N and 4M selected from the whole population of St David's Girls were sampled for interviews and lesson observation. Interviews were done with Physics teachers and twenty students.

In the first chapter of this study background of the study, research questions, statement of problem, significance of the study, limitations and delimitations of the study were highlighted. The second chapter reviewed the related literature in line with research questions. The third chapter of the research gave research design, population, sample and sampling technique that were used in the research are going to be defined and justified. The third chapter focused on ethical considerations. Data collection, presentation and analysis procedures were highlighted in the chapter three. The forth chapter presented and analyzed data obtained from the research tools such as questionnaires, observation guide. Lastly this chapter is going to give the summary, conclusions and recommendations of the study.

Below are some challenges which the respondents claim that they meet when using Digital learning platforms in the teaching and learning of Ordinary Physics.

- Face too much resistance from the administration.
- Face resistance to change by some other members of the science department to turn into new ways of teaching Physics.
- Domination of institutional memories by long serving teachers who used out dated instructional methods to deliver their lessons.
- Laborious marking of student scripts since learners had to send their work to your inbox and as a teacher you need to download it and remarks and resend back to the student.
- Lack of classroom management since learners will be doing digital.

From this information, it can be noted that Physics teachers are facing challenges from teaching via Digital learning platforms. Domination of institutional memories will cause long serving members to resist the new digital teaching methods. Teachers claim that students were indiscipline and other learners appeared to be digital yet they are watching movies. Further, the lack of classroom management will be the greater problem of Digital learning platforms application.

60% of the respondents from the questionnaires (N=200) claimed that audios and documents were difficult to download and hence they took so many hours to download it. Also, 20% of learners were complaining of erratic power cuts which resulted on their phone batteries going flat. Further, 5% of respondents claimed that their parents due to economic hardship did not manage to purchase them enough data bundle for digital lessons.

Furthermore, 75% of respondents had personal smart phones but 80% of them had problem in downloading lecture notes, documents and other learning materials. Further, the data revealed that 69% agree on time consuming since the sending of documents requires strong internet or Wifi. Therefore, the use of Digital learning platforms in teaching Physics is a challenge to many teachers. However, students' reply and response to teacher's messages and instructions seem to be the only way to check their presence in the class. Response from teachers, 70% were complaining of slow internet and hence time consuming on sending learning materials.

Results revealed that Google meet stood by 35% followed by Zoom with 40% and the majority of respondents preferred Digital learning platforms (90%) to conduct their lessons.

Despite its highest percentage, the respondents faced so many challenges during holiday lessons and Physics teachers were complaining of poor students' participation. 90% of students as highlighted on Figure 1 are active users of Digital learning platforms in real life; the situation is reversed in a learning circle. Physics learners are passive, unprepared to learn actively, cooperatively and independently via Digital learning platforms.

In this current study Physics students' learning was affected by limited internet access because of poor infrastructure, geographical location and the high costs of internet packages. Most respondents noted that they did not have stable internet access and were unable to participate, download videos, audios and lecture notes in class. We believe that respondents' place of residence (urban vs. rural) may explain some of these issues, as almost 40% of respondents live in rural areas where there is no signal towers and erratic power cuts.

Further, key findings are technological and pedagogical challenges, lack of professional development and overcoming challenges. Frequency analysis indicated that seasoned teachers were not happy with making the transition to distance learning. Although, they felt that they received support to implement or make the shift to distance learning there were a sizeable number of neutral responses which negated their perceptions. One of the key findings was that distance learning impacted their instruction and student engagement.

Lack of practical demonstrations like Oscillations, Ohms law, lack of teacher visibility in the class by the teacher, all these factors demotivated Physics learners.

Quotes from 100 respondents, learning via Digital learning platforms are absolutely perfect because they cover much syllabus contents within short period of time. Further, learners compared syllabus coverage to normal school hours and they said that during normal hours they were so many disturbing extra curricula activities which disturb learning of Physics. Therefore, the students commend Digital learning platforms as the best teaching methods to use the ever changing world.

5.3 Conclusions and recommendations

This research sought to investigate into challenges faced by teachers when using digital learning platforms in teaching physics at ordinary level in secondary schools in Nyanga district. Evidence suggests that Digital learning platforms are more advantageous as teachers are already using them and can be used at anytime and anywhere.

In light of the findings of this research, this study has led to several recommendations to the Ministry of Primary and Secondary Education (MoPSE) in Zimbabwe about teachers who are currently teaching from home. From the ministry's perspective, it is recommended that the MoPSE develops a policy to encourage asynchronous learning via Digital learning platforms or other suitable social applications among school students. This would pace a new way of borderless learning anywhere and anytime. Additionally, from the teachers' perspective, they may innovate their teaching by using M-learning, especially Digital learning platforms as a part of ESL learning pedagogy in Nyanga District post-COVID 19 pandemic.

Ninety percent of form 3s and 4s were suggesting that the teacher should notify their parents concerning the holiday lessons, so that the parents will be aware and budgeted money for buying enough data bundle for lessons. More so, learners were proposing that the administration should engage their parents and encourage them to buy private internet routers specifically for studying purposes. Further, 75% of learners were suggesting that the teacher should send short audios and document with small gigabytes as this would become easy for them to download it.

For resistance from school administration, the respondents suggested that these people need to be educated on the importance of syllabus coverage and how it improves the pass rates of learners. Both members of the science department and those with institutional memories need to be staff developed by resources person so that they can adapt to new methods of teaching than adapting to old teaching methods. For lack of management, the respondents will include parent in Digital learning platforms group so that they can monitor the work for their students.

Teachers should encourage the adoption of Digital learning platforms by channelling assignments and discussions on social media platforms to help inculcate the habit of using Digital learning platforms.

The researcher recommends the school to buy Wifi routers from Telecommunications to provide strong internet for teaching and learning of Physics using Digital learning platforms installed in laptops.

The researcher recommends all heads of department in to embrace the use of Digital teaching and learning tools as this application work to cover national syllabus in time and hence increase students pass rate

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Appendix A: Introductory letter from BUSE

Appendix B: Letter requesting for permission to collect data

Appendix C: Informed consent agreement form

I hereby agree to participate in research regarding…….

In giving my consent I state that:

- I understand the purpose of the study and what I will be asked to do.
- I understand that I am participating freely and without being forced.
- I understand that this is a research project whose purpose is not necessarily to benefit me personally the whole community.

- I have been informed about the nature of the research and the nature of my involvement.
- The researcher has answered any questions that I had about the study and I am happy with the responses.
- I understand that I can withdraw from the interview at any time and that this decision will not in any way affect me negatively.
- I understand that I may refuse to answer any questions I do not wish to answer.
- I understand that personal information about me that is collected over the course of this interview will be stored securely and will only be used for purposes that I have agreed to.
- I understand that information about me will only be told to the researcher's supervisor, and that my identity will not be referred to.
- I understand that the results of this study may be published, but these publications will not contain my name or any identifiable information about me.
- I consent to:
    - Audio-recording Yes…….No…….
    - Permanent archiving Yes…….No…….

Signature of participant: ……..

Date: ……

Appendix D: Learners' questionnaires

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

My name is Dawani .V. N, student number B231634B, a Bachelor of Science Education Honours Degree student at Bindura University of Science Education. I am carrying out a research as part of the requirements of my Bachelor of Science Education Honours Degree in Physics. The study investigates challenges faced by teachers in using Digital learning platforms platform in the teaching of Physics at Ordinary level in Nyanga District. The main thrust of this questionnaire is to gather information on advantages, challenges faced by learners and strategies to be adopted to improve learning via Digital learning platforms platform. Your participation in this study is highly appreciated. Information provided will be treated with strict confidence.

Section A

Tick your answers in the box provided

1. Gender Female [ ] Male [ ]
2. Class Form 3 [ ] Form 4 [ ]

Section B: Teaching Methods

3. What other digital teaching methods are commonly used by your teachers when teaching Physics?

i. ……..
ii. ……..
iii. ……..
iv. …….
v. ……

4. How effective are these digital teaching methods and which one is the most effective?
    i. ……
    ii. ……
    iii. ……
    iv. ……
    v. ……

Section C Importance of Digital learning platforms as an digital tool

5. How does the use of Digital learning platforms in teaching benefit you as a student?
    i. ……..
    ii. ……..
    iii. ……..
    iv. ……..
    v. …….

Section D: Challenges of using Digital learning platforms

6. What challenges you are facing when you are learning via Digital learning platforms platform?
    i. ……
    ii. ……
    iii. ……
    iv. ……
    v. ……
7. What do you suggest should be done to reduce the challenges you mentioned above?
    i. …….
    ii. …….
    iii. ……
    iv. ……
    v. ……

Appendix E: Teacher's questionnaires

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

My name is Dawani .V. N , student number B231634B, a Bachelor of Science Education Honours Degree student at Bindura University of Science Education. I am carrying out a research as part of the requirements of my Bachelor of Science Education Honours Degree in Physics. The study investigates challenges faced by teachers in using Digital learning platforms platform in the teaching of Physics at Ordinary level in Nyanga District. The main thrust of this questionnaire is to gather information on advantages, challenges faced by teachers and strategies to be adopted to improve learning via Digital learning platforms platform. Your participation in this study is highly appreciated. Information provided will be treated with strict confidence. Thank you very much in advance for your valued responses and time you spare to answer these questions

Age…… Sex…….

1. Are the Physics learners able to use Digital learning platforms as their learning tool? Yes…….No…….If no, explain the challenges faced.
   ……
   ……
   ……
   ……..
   ……
2. How often do you use Digital learning platforms as the teaching instruction
   ……..
3. What are other digital teaching tools do you use?
   ……
   ……
   ……

……
……..

4. What are the benefits of using Digital learning platforms as a teaching method?
……
……
……
……
……
……..

5. What do you think are the challenges of using Digital learning platforms in teaching?
……
……
……
……
……
…….

6. What should be done to minimise the challenges you have mentioned above?
……
……
……
……
……
…….

Appendix F: Interview guide for teachers

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

My name is Dawani .V. N, student number B231634B, a Bachelor of Science Education Honours Degree student at Bindura University of Science Education. I am carrying out a research as part of the requirements of my Bachelor of Science Education Honours Degree in Physics. The study investigates challenges faced by teachers in using Digital learning platforms platform in the teaching of Physics at Ordinary level in Nyanga District. Since you're a teacher in the discipline of Physics; it would be a good idea to interview you so that my dissertation will be well informed.

I would like to ask you some questions that pertains some experience you have in teaching and learning of Physics via Digital learning platforms.

The interview is going to take about 12 minutes. Are you available to respond to some of the questions at this time?

Questions

1. What is your level of education (highest qualification)?
   Diploma Bachelor's Degree Master's Degree other
2. How many years have you been serving as a Physics teacher?
   Five years or less More than 5 yrs, but less than 10 yrs More than 10
3. How often do you use Digital learning platforms as a teaching instruction?
4. What are other digital teaching methods do you use?
5. What are the benefits of using Digital learning platforms as a teaching method?
6. What do you think are the challenges of using Digital learning platforms in teaching ordinary Physics?

7. What should be done to minimise the challenges you have mentioned above?

Appendix G: Observation guide for Physics student who are taught via Digital learning platforms

Topic: An investigation into challenges faced by teachers in using Digital learning platforms platform in the teaching of Physics at Ordinary level in Nyanga District.

Issues to be observed	Comments
Individual participation in Digital learning platforms group	

Organisation of the learners	
Type of language used during learning	
Count number of responses or number of messages on in inbox	
Set feedback time	