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PRINCIPALS' DIGITAL COMPETENCE FOR EFFECTIVE ADMINISTRATION OF PUBLIC SENIOR SECONDARY SCHOOLS IN RIVERS STATE, NIGERIA

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ABSTRACT

This study investigated principal's digital competence for effective administration of Public Senior Secondary Schools in Rivers State, Nigeria. The study was guided by three research questions and three hypotheses modeled in line with the objectives of the study. The descriptive survey design was adopted. The population of the study consisted of all the 289 Principals comprising 208 males and 81 females. A sample size of 145 (104 males and 41 females) principals which represents 50% of the entire population was selected using the stratified random sampling technique. The instrument for data collection was a self-structured questionnaire titled "Principal Digital Competence Questionnaire (PDCQ)". The degree of reliability of the instrument was established using Pearson Product Coefficient Moment Correlation (PPMC). A test-re-test method was adopted to determine the reliability index which stood at ($r=0.82$) Mean scores and standard deviation were used to answer the research questions and t-test was used in testing the hypotheses at 0.05 alpha significant level. The findings revealed among others that, teleconferencing, videoconferencing and telecomputing have various impacts in facilitating distance learning, collaborative projects, virtual field trips, access to experts, and online assessments of students' performance and classroom management in the school system. The study concluded that investing in digital proficiency significantly contributes to the overall effectiveness and efficiency of school principals in managing educational institutions. The study recommended that, to enhance overall effectiveness, educational authorities should invest in comprehensive digital competence training programs for principals, encompassing tele-conferencing, video-conferencing, and tele-computing skills.

Keywords: Principal, Digital Competence, Effective Administration, Secondary Schools, Rivers State, Nigeria.

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INTRODUCTION

The advent of technology has made educational institutions to rely on the use of effective and collaborative technology tools to ensure the smooth running of the institution. The need, function, key initiatives and requirements of the academic institution environment has evolved beyond the traditional setting. The education sector being one of the cornerstones of societal development uses technological tools to enhance the process of administration, teaching and learning. There is a need to build the school environment on an information technical foundation that takes into consideration the current economic environment as well as other business ventures impacting the education market as a whole. Different types of educational technologies have evolved from time to time and each technology addresses the questions of improving administration, instructional reach, and delivery, as well as the teaching and learning quality. Audio-visual aids, print, mass media, computer mediated learning; teleconferencing videoconferencing and tele-computing are technologies that are available in education and training. These technologies co-exist with the old technologies and often converge within combinations to achieve better results. Teleconferencing, video computing and telecomputing are good examples of convergence of technologies.

Teleconferencing is a form of computer mediated communication which allows information to be sent from one individual to another or a group, and vice versa without the constraints of time and location. Teleconferencing is one of the main advanced Information and Communication Technologies used by principals for communicating and coordinating administrative process. Negash et al. (2008) defined teleconferencing as a meeting among two or more participants which allows them to interact by means of a two-way video and audio transmission simultaneously, as well as to exchange data in real time through the internet. Teleconferencing has become an indispensable tool in academic institutions seeing that it offers the opportunity for several persons and machines to collaborate and participate in live exchange and mass articulation of knowledge or information while remaining in divergent regions but linked by a telecommunication system. The recent pervasive penetration of digital technology has significantly elevated the importance of a platform of digital capabilities.

Video conferencing or video conference (also known as a video teleconference) is a set of interactive telecommunication technologies which allow two or more people in different location to interact via two way video and audio transmission simultaneously. Video conferencing according to Omotayo and Umoru (2015), is an advanced form of video calls that enables real-time audio and visual communication between users in different locations, facilitated by various video conferencing software. Participants can join group video conferencing, present content, record meetings, and communicate via messages, all from their personal computer using different video conferencing services.

Tele-computing refers to the use of computers and telecommunications technologies to communicate and exchange information between two or more distant locations. It involves the transfer of data, messages, or other forms of communication via networks, such as the internet, telephone lines, satellite communications, or wireless connections. Tele-computing enables remote access to resources, collaboration, and the sharing of information, making it easier for individuals or organizations to communicate and work together regardless of their physical location.

The goal of today's principal is to be more efficient, up- to-date, and prompt in delivering qualitative objectives created by fully integrated communication technology and collaborative

teams. The leadership and administrative bar of principals will have to be raised high in order to meet up with present and future global challenges. This will not be about what the principals need to learn, but about how it is learned. In that regard, the optimal and efficient use of technology will play a major role in framing the future of administrative effectiveness in schools. By this, many administrative solutions will be based on outcomes relating to the use of technology and in this case, teleconferencing, videoconferencing and tele-computing.

Learning new technologies should be paramount in every principal's job description as this will help to change the entire school's perspective about the use of technology thereby making it a priority. This will spur the principal to make positive and drastic changes on how technology is used in schools and to also ensure that the staffs are provided with the requisite knowledge and skills needed for administrative effectiveness. In turn, teachers will need to learn how to use technology in classrooms without walls. For traditional principals, this will be mind boggling, and for future oriented principals, it will be exhilarating.

There is little doubt that new technology-savvy principals will be taking the lead. Students of the future will be taking virtual field trips to other countries. They will be video conferencing digitally with foreign experts who can help them develop understanding and skills. Distance will no longer be an issue. Principals, wanting students to compete globally will no longer be able to ignore the importance of digital competencies. These principals, with a new vision, will be taking steps to change mind-sets, policies and practices

Principals are expected to adapt to network technical innovations that allow for better implementation and resiliency of new network services. These innovative network services should be able to operate seamlessly and efficiently within the school, and should also support different voice, video and data services. This should enhance communication process and should also heighten the collaboration with other professional colleagues. One of the most reliable ways of holding meetings is through teleconferencing and this reliability has increased tremendously over the years due to globalization and rapid advancement in technology.

Principals are known to feel isolated in their work despite the fact that they are being surrounded by so many administrative issues, teachers, students, parents and the community clamoring for their attention. Borema (2011) in an interview of school principals to discover the challenges faced by principals and the support they needed to be successful uncovered that loneliness almost seems to be an epidemic to the office of school administrator, especially in small schools. Hobson et al as cited in Garcia-Garduno, Slater and Lopez-Gorosave (2011) identified challenges faced by principals especially in their early years of principal-ship to be feelings of professional isolation and loneliness. Principals were found to experience limited interactions with other principals and administrators about complex, multifaceted, and important issues, such as student achievement, social climate, safety, and school improvement.

Administration of secondary education has become more complex as a result of the increasing number of students' enrolment, staff strength and multifaceted administrative needs of the schools. There has been an increasing public fear and complaints that the administrative effectiveness of principals has dwindled. This could be attributed to the fact that most principals are usually not on ground to oversee the effective smooth running of the schools due to incessant travels out of the school location for administrative meetings. This dampens the commitment level of the teachers and other staff in general. There are no immediate opportunities to get public reaction to issues as they arose and to interact with other principals and administrators about important administrative issues. Furthermore, a high accountability demand is placed on secondary school principals with little or no support for computer mediated interactions which

leaves the principals feeling isolated and ineffective in the discharge of their administrative duties. Hence, this paper looks at principals' digital competence for effective administration of public secondary schools.

Statement of the Problem

The principals of secondary schools seem not equipped with modern administrative competence in the use of digital technology in their day to day running of the school system. The world today is changing with different trends of digital technological development. Principals as school leaders are expected to respond to the changing requirements of the society in order to live up to expectations in meeting with the challenges and changes of the digital age. The use of digital devices in the classroom to plan lesson and other teaching and learning activities has become necessary in the present world of teaching. The principal is the implementer of educational curriculum. While curriculum is changing today, and recently, the integration of technology into teaching and learning processes has created the need for principal digital competence. But most principals are still stagnant and virtually unable to cope with the new knowledge and new trends in education sector. However, the continuous use of the same unimproved knowledge, methods and notes, even as the society and knowledge is evolving at a rapid rate with increasing technological development may have affected the achievement of educational goals and objectives in recent time.

This situation is worsened when the school principal lacks the knowledge, skills and attitudes to utilize tele-conferencing, video conferencing, inability to create learning networks and digital content in tele-computing. This adversely affects the administration of secondary schools. It is therefore the focus of this study to investigate principals' digital competence for effective administration of public senior secondary schools in Rivers State.

Aim and Objectives of the Study

The aim of this study was to investigate the extent of principals' digital competence for effective administration of public senior secondary schools in Rivers State. Specifically, the objectives were to:

- Examine the extent to which principal's digital competence in tele-conferencing promotes effective administration of public senior secondary schools in Rivers State?
- Ascertain the extent to which principal's digital competence in video-conferencing promotes effective administration of public senior secondary schools in Rivers State?
- Determine the extent to which principal's digital competence in Tele-computing promotes effective administration of public senior secondary schools in Rivers State?

Research Questions

The following research questions guided the study:

- To what extent does principal's digital competence in Tele-conferencing promotes effective administration of public senior secondary schools in Rivers State?

- To what extent does principal's digital competence in video-conferencing promotes effective administration of public senior secondary schools in Rivers State?
- To what extent does principal's digital competence in Tele-computing promotes effective administration of public senior secondary schools in Rivers State?

Research Hypotheses

The following null hypotheses were tested at 0.05 levels of significance:

- There is no significant difference between the mean ratings of male and female principals on the extent principal's digital competence in Tele-conferencing promotes effective administration of public senior secondary schools in Rivers State?
- There is no significant difference between the mean ratings of male and female principals on the extent principal's digital competence in video-conferencing promotes effective administration of public senior secondary schools in Rivers State?
- There is no significant difference between the mean ratings of male and female principals on the extent principal's digital competence in Tele-computing promotes effective administration of public senior secondary schools in Rivers State.

LITERATURE REVIEW

Concept of Principal

Ibukun (2004) opined that principal is the leader and chief executive of his school who is expected to perform certain professional and administrative roles in order to ensure proper teaching and learning. In the view of Alimi et al. (2011), principal's competences as the administrative, technical and instructional leader of the school has become a matter of concern in recent years as there are increasing public outcry on accountability in the educational processes. The Principal as a motivator according to Babayemi (2006), must not only be trained in the act of administration but must be well -acquainted with the principles that guide and control administrative processes. As the chief executive, the principal owes it as duty to modify the attitude of the staff and motivate them to put in their best at achieving educational goals through effective teaching-learning process and effective communication.

The school principal is the leader of the school. He is the receiver and implementer of the policies formulated by national or state policy makers. As a leader, he reforms initiatives on the policies created by the district heads. Accordingly, Aghenta (2006) viewed school principal as a school leader who determine the form situations in school, and give direction to expert on development of teaching and learning in school. The principal has a duty to lead, guide, conduct, direct and motivate both the teaching and non-teaching staff toward achievement of the school goals and objectives. The principal provide moral supports to staff, showing appreciation for performance of individual staff, taking cognizance of the opinion of staff and check their actions. Consequentially, the school principal is an intellectual stimulator, he encourages the staff to reflect on what they have planned to achieve with the students and how it should be achieved. Udalla (2018) asserted that the principal is a leader in secondary school that works for the success of instructional programs. This implies that school principal is an administrator in secondary school that facilitates teaching and learning processes.

Okoli (2006) suggested that principal is an educationist with professional ability charged with various responsibility of educational development through the application of administrative skills which involve goal attainment. However, he is charge with the responsibilities to secure and use inputs from the external environment, transform them through administrative activities such as providing a structure, developing a culture, monitoring, decision making, communication, administering personal and financing the school to produce quality output. The principal is the instructional and administrative head of secondary school. He is responsible for the maintenance of the school environment, as well as the achievement of stated objectives of the school. The principal is the first citizen of the secondary school. Hence, he is the instructional leader, possession of policies made at the national and state, and establishment of the school culture. The principal is the manager, coordinator, planner, organizer, and supervisor of the school facility. Ekundayo (2010) and Kukali et al. (2018) opined that principals must be completely interested with the real things in the school environment especially the facilities in school surrounding. The principal who is the custodian of school facility ensures proper maintenance of educational facilities to prevent loss of time and money. In order to achieve effectiveness and efficiency in the school system, the attitude of principals on the maintenance of the school facilities in secondary school must be viewed seriously.

A principal as the head of school occupies a pivotal position requires initiatives and skills for the day to day administration of a secondary school. As a school leader, the principal must have foresight for the effective, efficient and dynamic principles in handling matters between the school, and staff and the host community. Similarly a principal must be in a position to guide and provide expertise guardian in regards to curriculum development, teaching methods, and evaluation as well as supervision of human and material resources. For school to function well, the principal must be in a position to exploit all possible means to keep a healthy environment for the students, staff and general public. Therefore, as a principal, who is the chief executive officer of a school, should guide and inspire the teachers for job satisfaction, and also mediate between the school and the society. This implies that the principal is responsible for supervising, motivating and ensuring that teachers are satisfied in their job. Onwurah (2013) asserted that the principal is the person who ensures that the teachers are effective in their instructions to students and the maintenance of school facilities.

Concept of Digital Competence

According to Udu and Odo (2016), competence is a measurable knowledge, skills, abilities and behaviours critical to successful job performance. Therefore, the choice of right competence allows school principals to plan, determine the best option, select personnel based on needs, manage, train and develop staff. Principal digital competence is the knowledge; skills and attitudes of principal to improve their practice build capacity in their staff and drive student's learning towards the use of digital technology in teaching and learning.

Adonis (2006) opined that Digital competence represents a person's ability to perform tasks effectively in a digital environment; digital means information represented in numeric form and primarily use by a computer, and literacy includes the ability to read and interpret media, to reproduce data and images through digital manipulation and to evaluate and apply new knowledge gained from digital environments. Newhouse (2002) described digital literacy as a combination of technical-procedural, cognitive and emotional-social skills. Suryani (2010) explained that the concept is used to describe our engagements with digital technologies as they

mediate many of our social interactions; they submitted, however, that the literacies associated with participation in digital practices and cultures are complex in work environment.

Concept of Administration

Ogbonnaya (2009) defined administration as a process which entails the utilization of human, financial, and material resources in maximizing the realization of goals or objectives. It involves the coordination of human and material resources towards the attainment of predetermined educational objectives. Boma (2018) opined that administration is the bringing all the attributes of administration to bear on educational issues and problem in an effort to realize the educational objectives. Administration, as defined by Eden (2006) involves planning activities which aim at the fulfilment of the goals of a particular organization or institution. It calls for the ability of activity or tool through which the fundamental objectives of the institutional process the administrators to make the right decisions to fulfil the required goals.

Liverpool and Jacinta (2013) opined that in an institutional setting, administration has been extended as a service may be more optimized efficiently when allocating human and material resources as well as to make the best use of existing resources. Educational administration as defined by Ukeje et al. (2000), involves the provision and maintenance of the necessary manpower (personnel) and plant (facilities) in order to render useful services to those who teach the students with a view to bringing about desired change in behaviour. Therefore educational administration is the coordination of resources to ensure effective and functional teaching and learning in schools. The central purpose of administration in any organization is that of coordinating the effort of people towards the achievement of its goals.

Management of School Finance The principal is the chief executive and accounting officer who is entrusted with the responsibility of controlling the revenue accruing from the school and ensuring judicious utilization of school fund like Parent Association (PA) levy. In order to raise fund to complement the efforts of the government, the principal can establish a very good rapport with the Parents Association, Board of Governors, Old Students' Association and Non-Governmental Organizations for fund raising activities. As a result, the principal has the responsibilities of ensuring that these facilities are in good shape. Even with the huge resources at his disposal, he has the responsibility of providing teachers and other instructional staff with necessary resources for effective teaching (Babayemi, 2006).

Concept of Administrative Effectiveness

Administrative effectiveness as stated by Adeniyi (2012) referred to the ability of school principals to carry out administrative task related to instructional management, internal relations, institution management, administration, students, performance and school community relations towards achieving the school goals and objectives. Sheppard and Dibbion (2010) observed that the effectiveness of a school administrator is a function of his/her ability to identify certain basic components of his/her assignment. Administrative effectiveness of an educational institution must meet the following key factors; professional development and quality of school; administrative employment satisfaction; acquisition, availability and efficient utilization of resources; community relations; career and personal development. The ability of a school to achieve the set goals and objectives can be reflected by the level of administrative efficiency. An

institution is said to have attained effectiveness if it is able to make good use of personnel, money, time, energy and materials to produce desired and expected quality outcomes. It has been shown in most cases that administrative effectiveness is a critical success factor that determines the overall performance of post-primary institutions.

Tele-Conferencing as Digital Competence for Effective School Administration

Teleconferencing is a form of computer mediated communication which allows information to be sent from one individual to another or a group, and vice versa without the constraints of time and location. Teleconferencing is one of the main advanced Information and Communication Technologies used by principals for communicating and coordinating administrative process. Negash et al. (2008) defined teleconferencing as a meeting among two or more participants which allows them to interact by means of a two-way video and audio transmission simultaneously, as well as to exchange data in real time through the internet. Teleconferencing has become an indispensable tool in academic institutions seeing that it offers the opportunity for several persons and machines to collaborate and participate in live exchange and mass articulation of knowledge or information while remaining in divergent regions but linked by a telecommunication system. The recent pervasive penetration of digital technology has significantly elevated the importance of a platform of digital capabilities.

The Importance of Teleconferencing in Education

- **Remote Learning:** One of the most apparent advantages of teleconferencing in education is remote learning. Students no longer have to feel confined to their classrooms. With teleconferencing, they can reap the benefits of knowledge from all over the globe. They can interact with experts, students from other schools, and visit places they have never visited at the push of a button. With teleconferencing, educators can make themselves available even when they are not at the school. This means they can lecture students who might need their help outside office hours, or collaborate with other experts and specialists without them having to be in the same classroom.
- **No Need to Go on Field Trip:** As teleconferencing can be conducted anywhere in the world between different classrooms, no longer do students need to go on field trips as much. This will save the schools the time and the energy. Cost reductions can also be significant. Being able to teleconference with hundreds of students will certainly reduce expenses. Compared to the conventional method of cost of bus, train flight and meals, teleconferencing offer many cost savings. You can take your students on a trip thousands of miles away with only at a push of a button. The school management can use the time and cost saved from reduced trips more productively.
- **Attend Class from Home:** Another use of teleconferencing in education is that it allows students attend class from home. Sometimes students may miss classes due to illness or challenges related to living in remote areas. Teleconferencing gives these students a real chance to attend classes from their homes, meaning they won't fall behind in class. This also works perfect for educators as staff meetings can be done through teleconferencing. This simply means that staff members can cut straight to the live meeting and eliminate the unnecessary travelling and stress. The meeting can also be recorded and passed to staff members who were unable to take part in the live meeting.

- Strengthen Exchanges among Schools Weeks after a devastating earthquake struck Haiti in 2010, hundreds of high school students from New Orleans in Louisiana gathered at Fisher to discuss with students from New American School in Haiti's capital Port-au-Prince. The students shared terrifying experiences, messages of hope and encouragement, as they bonded over a video conference initiated by the Global Nomads Group. Most schools are using the technology to connect with students from other schools. This presents a great opportunity for students to connect with other students that they would possibly never meet otherwise.
- Invite Experts to the Class Wherever They Are With teleconferencing in education, boring classroom learning is a thing of the past. The technology gives educators new and exciting ways to teach their students. For instance, the technology allows teachers to invite guest speakers into the class to help illustrate important points in her lesson. This allows for an interactive experience for students with experts that boast a wealth of skills in the field being discussed. As well all know, specialists often have busy schedules. As such, teleconferencing is a better option as it can reduce travel time and simplify visits. Using this technology, a major college in a rural area was able to connect chemist specials with students undertaking the course for a detailed workshop.
- Connect Rural Schools to Outsides for Better Education Limited resources remain the common problem in most rural schools. Students in these areas have missed out on countless opportunities that their urban counterparts continue to explore. Connecting students in these areas via teleconferencing can greatly improve the quality of their education, ensuring that their rights to education are ultimately met both in practice and in theory. With teleconferencing in education, teachers connect their classes with the outside world to cross traditional classroom boundaries. This also prepares students to be citizens of the more open and more tolerant world of tomorrow.

Videoconferencing as Digital Competence for Effective School Administration

Video conferencing or video conference (also known as a video teleconference) is a set of interactive telecommunication technologies which allow two or more people in different location to interact via two way video and audio transmission simultaneously. Video conferencing according to Omotayo and Umoru (2015) is an advanced form of video calls that enables real-time audio and visual communication between users in different locations, facilitated by various video conferencing software. Participants can join group video conferencing, present content, record meetings, and communicate via messages, all from their personal computer using different video conferencing services. One of the main advantages of video conferencing over a traditional video call is the ability to establish eye contact and convey emotions and articulation, which is essential for social and business interactions.

Today, some of the most commonly used video conferencing platforms include Kumospace, TrueConf, CyberLink U Meeting, Zoho Meeting, Jitsi Meet, TeamViewer Meeting, Google Meet, Skype for Business, and Zoom. These platforms have become increasingly popular as the demand for effective remote work and collaboration tools has grown. As a result, the video conferencing market is expected to reach \$11.56 billion by 2027, with a significant increase in adoption due to various video conferencing trends. Whether for one-one meetings, interviews, on-boarding, small businesses or large corporations, video conferencing has become a worthwhile investment, enabling seamless communication and collaboration among teams.

Tele-computing as Digital Competence for Effective School Administration

Tele-computing refers to the use of computers and telecommunications technology to work remotely, whereas telecommuting refers to the practice of working from home or a remote location using telecommunications technology. Tele-computing refers to the use of computer and telecommunication technologies to enable remote access to work-related resources. This can include accessing company databases, email systems, and other software applications from a remote location. In essence, tele-computing allows employees to work from anywhere as long as they have access to the necessary technology and resources. Yardarm (2011) defined Tele-computing as the use of computers and telecommunications technologies to communicate and exchange information between two or more distant locations. It involves the transfer of data, messages, or other forms of communication via networks, such as the internet, telephone lines, satellite communications, or wireless connections. Tele-computing enables remote access to resources, collaboration, and the sharing of information, making it easier for individuals or organizations to communicate and work together regardless of their physical location.

According to McAdams (2006), tele-computing, telework, working from home (WFH), or working at home (WAH) is a work arrangement in which employees enjoy flexibility in working location and hours. In other words, the daily commute to a central place of work is replaced by telecommunication links. Many work from home, while others, occasionally also referred to as nomad workers or web computers utilize mobile telecommunications technology to work from any location.

THEORETICAL FRAMEWORK

Connected Leadership Theory

Connected Leadership Theory was propounded by Dr. Matthew Lynch, who is a professor of education at the University of Southern California in 2015. This theory suggests that school administrators need to develop six key capabilities in order to lead effectively in the digital age: digital access, digital learning, digital communication, digital citizenship, digital responsibility, and digital innovation. This framework can help school administrators to understand how to effectively integrate technology into all aspects of their work. He identified six key capabilities that are essential for effective connected leadership in education: Digital access: providing all students and staff with equitable access to digital tools and resources. Digital learning: promoting the use of technology to support personalized, student-centered learning. Digital communication: using technology to communicate effectively with students, parents, and the community. Digital citizenship: teaching students how to be responsible and ethical digital citizens. Digital responsibility: modelling responsible and ethical use of technology, and ensuring that policies and procedures are in place to protect the safety and privacy of students and staff.

Digital innovation: using technology to improve teaching and learning, and to transform the way schools operate. These six capabilities are interconnected, and they all work together to create a strong foundation for effective connected leadership in schools.

The Connected Leadership Framework was first proposed in 2015, in Dr. Lynch's book "The Connected Leader: Using Social Media to Build Relationships, Empower Learning, and Grow Your School's Community". The framework has since been expanded and refined, and is now widely used in education and beyond. It is seen as a valuable tool for school leaders who

want to use technology to improve learning and strengthen relationships in their school community.

The Connected Leadership theory is especially relevant for principals of secondary schools, who often have to navigate complex issues related to digital access, digital learning, digital communication, digital citizenship, digital responsibility, and digital innovation. For example, a principal might need to ensure that all students and staff have access to the digital tools and resources they need, while also making sure that those resources are used responsibly and ethically. They might also need to communicate with a variety of stakeholders (including parents, teachers, and the community) through a variety of digital channels, and promote a culture of digital citizenship in the school.

METHODS

The study adopted the descriptive survey research design. The population of this study consisted of all the 289 principals comprising of 208 males and 81 female from the 289 public secondary schools in Rivers State (Source: Rivers State Senior Secondary School Board RSSSB, 2021). The sample size was 145 (104 males and 41 females) principals which represents 50% of the entire population. The stratified random sampling technique was used in selecting the respondents. The instrument for data collection was a self-structured questionnaire titled “Principal Digital Competence Questionnaire (PDCQ). The Part ‘A’ of the questionnaire will be made up of the demographic data of the respondents while the part ‘B’ was made up of structured items centered on the variables of the study. The instrument was structured in line with the modified 4- points Likert response scale which provided four levels of opinion as: Very High Extent (VHE), High Extent (HE), Low Extent (LE), Very Low Extent (VLE), and weighted mean of $4+3+2+1=10/4=2.5$.

The instrument was validated by the supervisor and two experts in the Department of measurement and evaluation in the Faculty of Psychology, Ignatius Ajuru University of Education. Corrections and adjustments were adopted into the final draft of the instrument for administration. The degree of reliability of the instrument was established using Pearson Product Coefficient Moment Correlation (PPMC). A test-re-test method was adopted. The researcher and two trained research assistants administered and collated the distributed copies of the questionnaire. A total of 145 questionnaires were distributed and 143 were appropriately filled, returned and used for data analysis. This represents 98.6% returned rate. The Statistical Package for Social Sciences (SPSS) was used to analyse the data for the study. Mean scores and standard deviation was used to answer the research questions, while the independents t-test was used to test the hypotheses at 0.05 alpha level of significance.

RESULTS

Table 1: Summary of Frequency Distribution of Respondents based on Gender

	Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	102	71.3	71.3	71.3
	Female	41	28.7	28.7	100.0
	Total	143	100.0	100.0	

Data in Table 1 above shows that majority of the respondents [F=102(71.3%)] were male principals, while the remaining participants [F=41(28.7%)] were female principal.

Table 2: Summary of Frequency Distribution of Respondents based on School Location

School Location		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	96	67.1	67.1	67.1
	Rural	47	32.9	32.9	100.0
Total		143	100.0	100.0	

Data in Table 2 above shows that majority of the respondents [F=96(67.1%)] were principals in urban secondary schools, while the remaining participants [F=47(32.9%)] were principals in rural secondary schools.

Answer to Research Questions

Research Question One: To what extent does principal's digital competence in tele-conferencing promotes effective administration of public senior secondary schools in Rivers State?

Table 3: Mean and Standard Deviation on the extent to which principal's digital competence in Tele-conferencing promotes effective administration of public senior secondary schools

S/N	ITEMS	Mean	SD.	Remark
1.	It allows students and teachers to connect remotely which can facilitate distance learning.	2.94	0.61	High Extent
2.	It allows teachers and students and teachers to work together on projects and assignments from anywhere in the world.	3.06	0.56	High Extent
3.	It enables distance learners to complete their education while working full-time.	2.62	0.86	High Extent
4.	It can be used to take students on virtual field trips to museums, historical sites, and other locations around the world.	3.03	0.70	High Extent
5.	It provides students with access to experts in various fields who may not be available to come to the school in person.	2.84	0.98	High Extent
6.	It can be used for online assessments such as online quizzes, tests and presentations.	2.71	0.89	High Extent
N=143	Grand Mean & SD	2.87	0.77	High Extent

Data in Table 3 above presents mean and standard deviation values indicating the extent to which a principal's digital competence in tele-conferencing promotes effective administration of public senior secondary schools. The overall interpretation suggests a high extent of positive impact, with a grand mean of 2.87 and a standard deviation of 0.77 across various items, such as facilitating distance learning, enabling collaborative projects, supporting distance learners, organizing virtual field trips, connecting with experts, and conducting online assessments.

Research Question Two: To what extent does principal's digital competence in video-conferencing promotes effective administration of public senior secondary schools in Rivers State?

Table 4: Mean and Standard Deviation on the extent to which principal’s digital competence in Video-conferencing promotes effective administration of public senior secondary schools

S/N	ITEMS	Mean	SD.	Remark
7.	It can be used to deliver live instruction to students who are homebound due to illness or injury or for students in rural areas who may not have easy access to schools.	2.99	0.85	High Extent
8.	Collaboratively, it can be used to facilitate group projects between students who are located in different locations.	3.06	0.75	High Extent
9.	Videoconferencing can be used to provide professional development opportunities for teachers.	2.70	0.79	High Extent
10.	Videoconferencing allows teachers to bring in guest speakers from anywhere in the world without need for travel.	2.73	0.77	High Extent
11.	It helps to improve communication by allowing administrators see and hear each other in real time.	2.57	0.82	High Extent
12.	It saves time and money by allowing administrators conduct meetings virtually.	3.06	0.81	High Extent
N=143	Grand Mean & SD.	2.85	0.80	High Extent

Table 4 above illustrates mean and standard deviation values representing the impact of a principal's digital competence in video-conferencing on the effective administration of public senior secondary schools. The overall interpretation suggests a high extent of positive influence, with a grand mean of 2.85 and a standard deviation of 0.80, across various items such as delivering live instruction, facilitating collaborative projects, providing professional development, bringing in guest speakers, enhancing real-time communication, and saving time and money through virtual meetings.

Research Question Three: To what extent does principal’s digital competence in Tele-computing promotes effective administration of public senior secondary schools in Rivers State?

Table 5: Mean and Standard Deviation on the extent to which principal’s digital competence in Tele-computing promotes effective administration of public senior secondary schools

S/N	ITEMS	Mean	SD.	Remark
13.	It saves schools cost on office space, utilities, and other overhead costs.	3.06	0.67	High Extent
14.	It enables administrators to keep track record such as students’ files, attendance records and other data.	2.79	0.80	High Extent
15.	It enables administrators collaborate with colleagues in different locations allowing them to share ideas and resources more easily.	2.78	0.75	High Extent
16.	It can be used to collect and analyse data about student performance school operations and other key metrics.	2.81	0.78	High Extent
17.	It can be used to manage classrooms by using online tools to create and share lesson plans, track student progress and communicate with parents.	2.66	0.77	High Extent
18.	It provides online learning opportunities for students through the use of field trips and online lectures.	3.07	0.78	High Extent
N=143	Grand Mean & SD.	2.86	0.76	High Extent

This Table 5 above outlines mean and standard deviation values indicating the impact of a principal's digital competence in tele-computing on the effective administration of public senior secondary schools. The overall interpretation suggests a high extent of positive influence, with a grand mean of 2.86 and a standard deviation of 0.76, across various items such as cost savings, record-keeping, collaboration, data analysis, classroom management, and providing online learning opportunities, highlighting the multifaceted benefits of tele-computing in school administration.

Test of Hypotheses

Hypothesis One: There is no significant difference between the mean ratings of male and female principals on the extent principal's digital competence in Tele-conferencing promotes effective administration of public senior secondary schools in Rivers State.

Table 6: Independent sample t-test of the mean score of male and female principals on the extent principal's digital competence in Tele-conferencing promotes effective administration of public senior secondary schools

Gender	N	\bar{X}	SD	DF	t	p	Decision
Male	102	2.83	0.848	141	1.015	0.312	Significant
Female	41	2.96	0.095				Ho ₁ Upheld

Table 6 presents an independent sample t-test comparing the mean scores of male and female principals on the extent of their digital competence in tele-conferencing for promoting effective administration in public senior secondary schools. The results indicate a non-significant difference ($t = 1.015$, $p = 0.312$) between male ($M = 2.83$) and female ($M = 2.96$) principals, leading to the conclusion that the null hypothesis one (Ho_1) is upheld, suggesting no statistically significant gender-based variation in digital competence for tele-conferencing among school principals.

Hypothesis Two: There is no significant difference between the mean ratings of male and female principals on the extent principal's digital competence in Video-conferencing promotes effective administration of public senior secondary schools in Rivers State.

Table 7: Independent sample t-test of the mean score of male and female principals on the extent principal's digital competence in Video-conferencing promotes effective administration of public senior secondary schools

Gender	N	\bar{X}	SD	DF	t	p	Decision
Male	102	2.596	0.675	141	7.627	0.000	Significant
Female	41	3.488	0.506				Ho ₂ Rejected

Table 7 displays an independent sample t-test comparing the mean scores of male and female principals regarding the extent of their digital competence in video-conferencing for effective administration in public senior secondary schools. The results reveal a significant difference ($t = 7.627$, $p = 0.000$) between male ($M = 2.596$) and female ($M = 3.488$) principals, leading to the

rejection of the null hypothesis two (H_{02}), indicating a statistically significant gender-based discrepancy in digital competence for video-conferencing among school principals.

Hypothesis Three: There is no significant difference between the mean ratings of male and female principals on the extent principal’s digital competence in Tele-computing promotes effective administration of public senior secondary schools in Rivers State.

Table 8: Independent sample t-test of the mean score of male and female principals on the extent principal’s digital competence in Tele-computing promotes effective administration of public senior secondary schools

Gender	N	\bar{X}	SD	DF	t	p	Decision
Male	102	2.830	0.845	141	4.853	0.000	Significant Ho₃ Rejected
Female	41	3.943	0.088				

Data in Table 8 presents an independent sample t-test comparing the mean scores of male and female principals in terms of their digital competence in tele-computing for promoting effective administration in public senior secondary schools. The results indicate a significant difference ($t = 4.853$, $p = 0.000$) between male ($M = 2.830$) and female ($M = 3.943$) principals, leading to the rejection of the null hypothesis three (H_{03}), suggesting a statistically significant gender-based distinction in digital competence for tele-computing among school principals.

DISCUSSION OF FINDINGS

The Extent to which Principal’s Digital Competence in Tele-Conferencing Promotes Effective Administration of Public Senior Secondary Schools

The findings from Table 3, which focuses on the mean and standard deviation of a principal's digital competence in tele-conferencing for effective administration in public senior secondary schools, indicate a generally high extent of positive impact across various dimensions, such as facilitating distance learning, collaborative projects, virtual field trips, access to experts, and online assessments. This suggests that a principal's proficiency in tele-conferencing can significantly contribute to the enhancement of educational processes and administrative efficiency in schools. The high overall grand mean of 2.87 and standard deviation of 0.77 reinforce the consistency of these positive outcomes, underscoring the potential benefits of incorporating tele-conferencing skills into the skill set of school principals.

Table 6, which presents the results of an independent sample t-test comparing the mean scores of male and female principals on the extent of their digital competence in tele-conferencing, indicates a non-significant difference ($t = 1.015$, $p = 0.312$). This suggests that, in this specific study, there is no statistically significant gender-based variation in digital competence for tele-conferencing among school principals. The findings highlight the importance of recognizing and fostering digital skills in educational leadership without emphasizing gender distinctions, emphasizing the need for comprehensive professional development programs that cater to both male and female principals to ensure equitable access and application of digital tools for effective school administration.

The Extent to which Principal's Digital Competence in Video-conferencing Promotes Effective Administration of Public Senior Secondary Schools

The outcomes derived from Table 4, which explores the mean and standard deviation of a principal's digital competence in video-conferencing for effective administration in public senior secondary schools, reveal a high extent of positive impact across various aspects such as delivering live instruction, facilitating group projects, providing professional development opportunities, and saving time and money through virtual meetings. With a grand mean of 2.85 and a standard deviation of 0.80, the results indicate a consistent and favorable trend, emphasizing the significant role of video-conferencing skills in enhancing the overall efficiency and collaborative capabilities of school administrators.

Table 7, presenting the results of an independent sample t-test comparing the mean scores of male and female principals on the extent of their digital competence in video-conferencing, reveals a statistically significant difference ($t = 7.627$, $p = 0.000$). The findings suggest that, in the context of this study, there is a gender-based discrepancy in digital competence for video-conferencing among school principals. This underscored the importance of recognizing and addressing potential gender-related gaps in the acquisition and application of specific digital skills, highlighting the need for targeted interventions and professional development programs to ensure equitable access and proficiency in leveraging video-conferencing tools for effective school administration across all genders.

The Extent to which Principal's Digital Competence in Tele-computing Promotes Effective Administration of Public Senior Secondary Schools

The results from Table 5, which focuses on a principal's digital competence in tele-computing for effective administration in public senior secondary schools, highlight a high extent of positive impact across various dimensions such as cost savings, record-keeping, collaboration, data analysis, classroom management, and online learning opportunities. The grand mean of 2.86 and a standard deviation of 0.76 underscore the consistent positive outcomes, emphasizing the multifaceted benefits of tele-computing skills in enhancing administrative processes within educational institutions.

Table 8, presenting the findings of an independent sample t-test comparing the mean scores of male and female principals on the extent of their digital competence in tele-computing, reveals a statistically significant difference ($t = 4.853$, $p = 0.000$). This implies that, in the context of this study, there is a gender-based distinction in digital competence for tele-computing among school principals. These results emphasize the importance of recognizing and addressing potential gender-related gaps in the acquisition and application of specific digital skills, highlighting the need for targeted interventions and professional development programs to ensure equitable access and proficiency in leveraging tele-computing tools for effective school administration across all genders.

This study's finding is in agreement with the finding of Iroegbu and Etim (2017), they stated that tele-conferencing facilities were lacking in schools and that principal's gender has no significant influence on their attitude towards the use of teleconferencing.

CONCLUSION

The comprehensive examination of a principal's digital competence across tele-conferencing, video-conferencing, and tele-computing in public senior secondary schools yields insightful findings. Tables 3, 4, and 5 collectively underscore the positive impact of digital competencies on various aspects of school administration, including distance learning, collaborative projects, virtual field trips, record-keeping, data analysis, and cost savings. The consistently high grand means and standard deviations across these tables suggest that investing in digital proficiency significantly contributes to the overall effectiveness and efficiency of school principals in managing educational institutions.

Additionally, the gender-based analyses in Tables 6, 7, and 8 reveal noteworthy distinctions in digital competence. While there is no significant gender difference in tele-conferencing skills (Table 6), the study indicates significant disparities in video-conferencing and tele-computing proficiency between male and female principals (Tables 7 and 8). These findings highlight the importance of addressing potential gender-related gaps in specific digital competencies, emphasizing the need for targeted professional development programs to ensure equitable access and proficiency across genders. As educational institutions continue to integrate digital tools into administrative processes, these results underscore the significance of fostering a diverse and inclusive approach to digital skill development among school leaders.

Recommendations

- To enhance overall effectiveness, educational authorities should invest in comprehensive digital competence training programs for principals, encompassing tele-conferencing, video-conferencing, and tele-computing skills. These programs should be designed to address specific needs identified in the study, such as facilitating distance learning, collaborative projects, virtual field trips, and cost-saving measures through the use of digital tools.
- It is imperative to design professional development initiatives that specifically address the identified gender-related gaps in these skills. This might involve tailored training sessions, mentorship programs, or initiatives that encourage collaborative learning environments to bridge the digital competence divide among school leaders of different genders.
- Educational institutions and policymaking bodies should consider integrating digital skills as a core criterion in the selection and evaluation of school principals. This can be achieved by updating leadership frameworks, job descriptions, and evaluation criteria to explicitly include the expectation of digital proficiency.

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