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Investigating The Impact Of 21st Century Teaching Skills On Teacher Productivity In Public Senior Secondary Schools In Rivers State

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ABSTRACT

The study examined Investigating the Impact Of 21st Century Teaching Skills On Teacher Productivity in Public Senior Secondary Schools in Rivers State. Two (2) research questions and 2 hypotheses guided the study. The design for the study was correlational, population as the 6920 teachers in public senior secondary schools in Rivers State and sample as 692 teachers selected using the stratified random sampling technique. The instruments of the study were the 20-item 21st Century Teachers Skills Scale (21st CTS) and the 10 –item Teachers Productivity Scale, designed by the researcher in the modified 4-point Likert model of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE) and Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) for 21st CIS and IPS with reliability indexes of 0.83 and 0.90, respectively obtained using Cronbach Alpha statistical procedure. Simple regression was used in answering research questions 1 – 6 and multiple regression for research questions 7 while t-test associated with simple regression was used in testing hypotheses 1 – 6 and ANOVA associated with multiple regression for hypotheses 7. The result of the study showed high and very high extents of relationship between 21st Century Teachers Skills and teacher productivity, singularly and jointly established significant relationships between 21st century teachers' skills and teacher productivity in public senior secondary schools in Rivers State. The study concluded that, 21st century teachers' skills of Information Technology, communication, innovative, entrepreneurial, emergency problem solving and soft skills when singularly and jointly used are valuable instrumentalities for guaranteeing teacher productivity in public senior secondary schools in Rivers State. Consequently, the study recommended among others that, 21st century teachers should be encouraged to continue to make us of appropriate Information Technology, communication, innovative, entrepreneurial, emergency problem solving and softs sills so identified in the performance of their functions and also make efforts to identify for use additional variants of skills as they have strong relationships with teacher productivity.

Keywords: Investigating, Impact, 21st Century, Teaching Skills, Teacher Productivity, Public Senior Secondary Schools.

INTRODUCTION

In the 21st century, teachers must acquire contemporary skills to meet the rapidly evolving demands of education, particularly in the areas of information and communication technologies (ICT) and other critical competencies. Skill development refers to implementing methods that teach new abilities and adaptive behaviors while minimizing ineffective ones (Cohen & Volkmar, 2015). For example, proficiency in using computers for learning and communication has become a crucial skill. Moreover, skill development complements knowledge acquisition by equipping educators with relevant abilities to enhance their performance in their current roles (Wordcraft, 2017). This suggests

that teachers lacking specific competencies can achieve improved performance when they participate in skill-enhancement programs. Skill development, therefore, is a systematic process aimed at equipping individuals, such as teachers, with the knowledge and expertise to better understand their work environment and perform their tasks more efficiently. According to Plymouth University (2013), skill development is an ongoing journey throughout a professional's career. Essentially, it involves enhancing the capability of individuals beyond their formal education, focusing on sustained and intensive approaches to improving educators' effectiveness in raising student outcomes (NJEA, 2014). It also encompasses activities that foster the skills, knowledge, and professional characteristics of teachers.

Bayo (2013) highlighted that in this era of globalization and technological advancement, education serves as a cornerstone for all human endeavors. Education contributes to human capital development, improves quality of life, and enhances productivity. Consequently, teachers need to acquire specific skills to improve their effectiveness. Twenty-first-century skills encompass a broad spectrum of knowledge, habits, and character traits deemed essential for success in modern secondary schools, workplaces, and careers. However, many organizations face a disparity between their needs and the existing skill sets of employees. Employers frequently express concerns about the inadequate skills of recent graduates, emphasizing that knowledge alone is insufficient for success in today's world (Bialik & Fadel, 2015). The concept of 21st-century learning has become central to educational discourse. Zhao (2009) argued that education must be restructured to prioritize higher-order thinking skills such as critical thinking, problem-solving, creativity, adaptability, and curiosity skills that can be cultivated through technology integration. The COVID-19 pandemic underscored the importance of these skills, which remain vital in a post-pandemic context due to the relevance of ICT for 21st-century learners. Additionally, technology supports school administrators and policymakers by enabling virtual simulations to analyze needs, assess policy options, and evaluate educational outcomes in terms of feasibility, cost, and sustainability.

Innovation in education involves implementing practices and processes that foster creativity, improve organizational management, and enhance supervision in educational settings (Oslo, 2015). These practices are particularly effective in boosting teachers' efficiency. Furthermore, problem-solving skills are fundamental to teachers' professional development, as they facilitate positive change among students and enhance collaborative expertise, peer support, and problem-solving capabilities in education (Ekundayo, 2012). Teachers, as facilitators of learning, play a critical role in nurturing students' talents and entrepreneurial abilities while instilling confidence and essential competencies such as communication and scientific literacy. Consequently, teachers must acquire entrepreneurial skills to impart them effectively to their students. Entrepreneurship education involves more than preparing students to become business owners; it creates an environment that fosters creativity, critical thinking, risk-taking, and responsibility (Gautam, 2015). Education remains a key driver of economic development, particularly in developing nations like Nigeria. However, the challenges facing education in the 21st century, such as inadequate teacher skills to address current needs, highlight the urgency of equipping educators with the competencies required to meet these demands effectively.

Nwagwu and Nwankwoala (2020) argued that achieving the status of an emerging economy amidst various challenges remains elusive without a pragmatic and functional educational system. It is widely acknowledged that no nation can grow or develop beyond the quality of its education, as the managerial competencies necessary for resource management in a developing economy are inherently products of education. Education is fundamentally a process of human development, enabling individuals to gain a deeper understanding of themselves and their environment. This process is characterized by continuous growth and transformation, ultimately resulting in learning. However, the effectiveness of this process is influenced by the unique educational challenges each country faces, particularly in the 21st century. As standards for 21st-century learners rise, educators must also possess the requisite values, skills, and knowledge to effectively meet these demands and achieve educational goals. Teaching, as a profession, is both demanding and intricate, requiring highly skilled and capable individuals. The complexities of the profession, coupled with contemporary challenges, place significant demands on teachers. Education, often defined as the acquisition and transfer of knowledge and skills, is a dynamic process influenced by technological

advancements that have reshaped communication and various aspects of life. Skill development, therefore, plays a critical role in equipping individuals with competencies such as technical, human, conceptual, and organizational skills essential for growth and productivity.

Nwaeke and Obiekwe (2017) emphasized that the success of any organization is directly tied to the skills, knowledge, and competencies of its workforce. Skill development involves activities that prepare individuals to assume greater responsibilities within an organizational hierarchy. A teacher's greatness is often measured by their lasting impact on students, inspiring them toward success and positive life outcomes. For students to excel, they require teachers who are engaging, effective communicators, and adept at employing productive teaching methods. Effective educators establish clear objectives for each lesson and work diligently to achieve them, leveraging the right skills to ensure success (Jim & Charles, 2016). Teacher skills are particularly crucial in the early stages of their careers when performance data may not yet be available. While qualifications often serve as indicators of teacher quality, many schools prioritize skill development when hiring new teachers. Goe (2011) highlighted that skill development consistently yields strong positive effects on student learning and academic performance. Essential skills for teachers include classroom management, collaboration, critical thinking, curriculum development, evaluation, and creating a conducive learning environment, among others. Within the school setting, teachers are central to the teaching and learning process. They play a pivotal role in fostering learners' cognitive, emotional, and psychomotor development, assisting parents in guiding their children's career paths, and nurturing unique talents and abilities (Anashe, 2016). Teachers blend learners' skills and knowledge to prepare them for coexistence, work, and meaningful participation in an interconnected world. To fulfill these responsibilities, teachers require comprehensive preparation and continuous professional development to sustain their competencies, knowledge, and values (Ubi & Edet, 2013).

The challenges of 21st-century education extend beyond learners to include policymakers, curriculum developers, administrators, parents, communities, and especially teachers. While each stakeholder faces distinct responsibilities, teachers uniquely bear the task of implementing the curriculum, a fundamental component of the learning process. Teachers tasked with cultivating 21st-century skills must navigate curricula that are culturally nuanced, globally informed, and creativity-centered (Obanya, 2004; National Policy on Education, 2014). Furthermore, the professional skills required of teachers must align with national and international standards, incorporating best practices, ethical values, and deliberate policies for career development and growth in the 21st-century educational environment.

Adeosun (2014) emphasized that Nigeria's teacher training curriculum is inadequate in equipping educators with the necessary skills to implement modern learning strategies, such as constructivist learning, learner-centered instruction, and integrating technology into the teaching process. He further highlighted a significant disconnect between the training teachers receive and the practical realities of teaching in the 21st century. This gap creates a substantial shortfall in addressing learners' needs and preparing them to meet societal challenges. In addition to the inadequacy of teacher education content, the introduction of 42 subjects and 34 vocational, trade, and entrepreneurship courses to address 21st-century educational demands has not been matched by the recruitment and training of sufficient qualified teachers. This situation undermines the objectives outlined in the National Policy on Education, necessitating urgent investment in teacher skill development. Teaching in the 21st century requires more than foundational knowledge of educational theory and classroom management. Teachers must collaborate with colleagues to adopt new technologies, design lessons that prepare students for a global economy, and ensure that learning is relevant to students' daily lives. They must also foster critical thinking, facilitate teamwork to promote equity in education, and remain updated on developments in their field. Effective teaching demands the ability to manage classrooms efficiently, create meaningful lesson plans, and adapt to evolving educational challenges.

It is crucial to distinguish between educational objectives and outputs. Objectives represent the broad goals of education, such as fostering vocational skills, intellectual growth, and physical development. Outputs, however, are the specific means by which these objectives are achieved. For example, equipping teachers with 21st-century skills is an objective, while their productivity in enhancing student academic performance is an output. Productivity is essentially the output generated per unit of input. In educational settings, this could involve maintaining consistent teacher input while

increasing their measurable contributions to student outcomes. Teachers play a critical role in nurturing the skills and abilities of students, who represent the future leadership of society. Mabaso and Dlamini (2017) asserted that achieving this goal requires educational institutions to recruit and retain highly skilled teachers. This can only be accomplished through effective compensation policies, supportive work environments, and robust professional development initiatives. Given the rapidly changing demands of the modern world, capacity building for teachers is indispensable. In Rivers State, public secondary school teachers currently operate in poor working conditions with minimal opportunities for professional development. This lack of support significantly hampers their ability to meet the demands of 21st-century education, highlighting the urgent need for improved training and working environments to boost productivity.

Statement of Problem

The evolving demands of the 21st century have significantly redefined educational practices, necessitating the integration of innovative teaching skills to enhance teacher productivity and overall educational outcomes. In public senior secondary schools in Rivers State, teachers are increasingly expected to deploy a wide range of 21st-century skills, such as critical thinking, effective communication, collaboration, and digital literacy, to foster an engaging and inclusive learning environment. These skills are indispensable in equipping students with the competencies needed to thrive in an ever-changing global landscape. However, there is growing concern that the implementation of these teaching strategies is uneven, and the extent to which they impact teacher productivity remains unclear. Evidence suggests that many teachers in public senior secondary schools in Rivers State face challenges in integrating 21st-century teaching skills into their pedagogical practices. These challenges often stem from inadequate professional development opportunities, limited access to technological tools, and a lack of institutional support. Consequently, this has raised questions about the ability of teachers to effectively meet the learning needs of students in a rapidly changing educational context. Furthermore, the disparity in the application of 21st-century teaching skills has implications for teachers' ability to manage classrooms efficiently, deliver quality instruction, and achieve desired learning outcomes.

Teacher productivity, which encompasses aspects such as lesson planning, student engagement, curriculum delivery, and assessment practices, is a critical determinant of educational success. Yet, the relationship between 21st-century teaching skills and teacher productivity in public senior secondary schools in Rivers State remains underexplored in the literature. This gap in research has hindered a comprehensive understanding of how these skills can be optimized to enhance teacher effectiveness and improve student learning outcomes. Therefore, this study seeks to investigate the impact of 21st-century teaching skills on teacher productivity in public senior secondary schools in Rivers State. By examining the specific dimensions of teaching skills and their correlation with productivity metrics, the study aims to provide empirical insights that will inform policy development, teacher training programs, and resource allocation. Addressing this problem is critical for fostering a dynamic and responsive education system capable of preparing students for the challenges and opportunities of the 21st century.

Aim and objectives of the Study

The study examined the relationship between 21st century teachers' skills and teacher productivity in Public Senior Secondary Schools in Rivers State. Specifically, the study sought to:

1. Ascertain the extent to which 21st century teachers' information technology skills relate with teacher productivity in public senior secondary schools in Rivers State.
2. Examine the extent to which 21st century teachers' communication skills relate with teacher productivity in public senior secondary schools in Rivers State.

Research Questions

The following research questions guided the study;

1 To what extent do 21st century teachers' information technology skills relate with teacher productivity in public senior secondary schools in Rivers State?

2 To what extent do 21st century teachers' communication skills relate with teacher productivity in public senior secondary schools in Rivers State?

Hypotheses

The following hypotheses were tested in the study at 0.05% alpha level:

1. There is no significant relationship between 21st century teachers' information technology skills and teacher productivity in public senior secondary schools in Rivers State.
2. There is no significant relationship between 21st century teachers' communication skills and teacher productivity in public senior secondary schools in Rivers State

CONCEPTUAL REVIEW

Concept of 21st Century Teachers Skills

In the field of education, learners can be grouped into three categories in relation to how learning occurs: visual learners, auditory learners, and aesthetic learners. Because individuals have preferences in how they assimilate, store, retrieve and use new information that is presented to them, no single teaching style can accomplish the learning needs of all students in a teacher's classroom (Downes, 2010). This is why teachers are required to differentiate their instruction - that is, teach in ways that meet their students' individual learning needs. One way of meeting the learning needs of pupils and students in school is for teachers to employ instructional resources such as models, pictorial illustrations that make it easy for teachers to convey messages to their students in accurate, proper, clear and understandable way so that, their students can understand complex ideas and abstract knowledge in simple, concrete terms (Saglam, 2013). Systematic and appropriate use of instructional resources in the classroom requires that teachers are conversant with the resources that have been procured or available for use. It is this knowledge base that will ensure that the teacher can identify resources they need for specific lessons, and the alternatives that are readily available for them to improvise with as their circumstances may dictate. Being aware of what they need and what benefits they and their students can access also dictate the need for capacity development in the selection and use of resources that can appropriately fulfill the objectives of their planned lessons and also help their pupils to learn what has been planned for them (Olawale, 2013).

Krneta, Bjekic and Milosevic (2014) stated that teacher's education includes pedagogical theory, teaching skills and professional skills. Teaching skills would entail giving practice and training in various approaches, strategies and techniques that would assist the teachers to impart and plan instruction, give suitable reinforcement and carry out effective and efficient assessment. It encompasses effective skills for managing the class, use and preparation of instruction materials skills. Pedagogical theory encompasses the sociological, psychological and philosophical aspect that would allow the teachers to possess a strong basis for practising the skills needed to teach in the classroom. Professional skills encompass the strategies, approaches and techniques that would assist teachers to develop their career and career growth. It encompasses counseling skills, soft skills, computer skills, information retrieving & management skills, interpersonal skills and life-long learning skills. Combination of pedagogical theory, teaching skills and professional skills would serve to develop the right attitude, skills and knowledge in teachers to promote holistic development (Gibbs and Coffey, 2011). Ameeta and Purohit (2009) pointed out that the major goal of any teacher's education or training programme is to develop teachers for initiating desired results in learning among students to optimize the resources namely material and human. Pre-service teacher education is needed for inducting fresh or new teachers and tries to change them into effective and competent teachers. Apart from these, it was also stated that teachers are the future designers of students and society. Teachers are expected to develop the universal principles and values like equality, justice and peace along with civic and social values. In system, teachers who possess soft skills would be a role model for teachers in numerous ways like decision makers, team leaders, negotiating stress, effective communication skills, solving the problem effectively and so on (Fulton, 2006).

Anand (2013) conducted a research to explore the soft skills level among secondary school teachers based on gender. Soft skills as interpersonal relationship skills and communication skills are required at various level in class as well as in society in order to communicate effectively and to develop relationship profoundly. Therefore it is significant that the teachers have to equip themselves through training programme for carrying out the teaching profession effectively and efficiently. It was found out that female teachers are effective communication skills rather than male counterparts. Al-Hattami

et al (2013) carried out a research to analyze the need for programs of professional training for improving teaching skills of faulty members. It was found out that high quality programmes regarding professional training for faculty members is essential and will become important to capacity of institutions to compete with the competitive world. A good professional development and training program are significant to integrate with classroom and theoretical practices for achieving the intended learning results. Teachers have to routinely attend training conferences and workshops regarding students' assessment and teaching strategies for understanding the learning process of students and for enhancing learning. By attending training programs teachers could be able to develop their generic skills like communication, responsibility and interpersonal, information technology, team work, critical thinking and so on and align assessment with learning results and methods for teaching.

Reddy and Krishnaiah (2014) conducted research to study about the role of teacher in laboratory of English language communication skills. It is a difficult job for the English teachers to build her or his students or learners communication skills. English teachers must have more patience and hard work with a dedication and commitment for procuring the expected result from their students. It was noticed that for developing the communication skills of their students, teachers have to attend lots of training programmes and practice sessions. The teacher of English language has to play multi roles such as motivator, counsellor, facilitator, mentor, diagnostician and friendly trainer. Balakrishnan and Raju (2015) explored the relationship between teaching competency and soft skills at high school level. Soft skills encompass skills of effectively communicating with the students. It was noted that teacher must be fluent in communicating the language. Communication skills are the back bone for teacher's personality and career development. Only through practice teachers would become effective and excellent. It was recommended that soft skill training and development programme must be part of teacher's pre-service and in-service training. Teachers have to upgrade themselves with soft skills that are significant for teacher for making it meaningful, effective and for shaping the future generation with good values, understanding power, for sustainable self-development.

Darvin (2011) examined the perceptions of teachers regarding the effect of political and cultural vignettes and situated activities for performance in their graduate course in teacher's education. Such vignettes which are political and cultural situations are provided to teachers; thus they will be able to practice the soft skills namely decision making skills which they require to use with colleagues, students, administrators, parents in various classrooms with specific reference to New York city. They deal with sensitive political and cultural issues like class, race, ethnicity, gender, sexual preference, religion and school politics which are designed for helping teachers for reflecting upon their ideologies, values, educational philosophies and biases. Thus it can be concluded that teacher educators could assist beginning tutors to develop decision making skills to tackle problems and take appropriate decisions. Farooqi (2013) explored how soft skills development among students and teachers of educational institutes play a significant role in maximizing the productivity. Teachers must be able to think in creative, critical, analytical and innovative manners that encompass the ability for applying knowledge. In addition to that, elements that teachers have to possess under problem solving and critical thinking skills are the ability to determine and analyze difficult situation and make estimations that are justifiable. They must also possess the ability to extend and enhance thinking skills, for providing ideas as well as alternative solutions. Laius and Rannikmae (2014) explored the effect of science teacher's longitudinal training course among 9^{th} grade students. It was found out that teacher's level of teaching in promoting decision making skills and its effect on student gains and number of teachers combined together in teaching inside the school had a great effect on their student's enhancement in skills along with scientific creativity and socio-scientific reasoning ability. It was clear that, training programme is needed for teachers to enhance their competencies and skills and this would enhance the students' achievement level.

Concept of Teachers' Productivity

A teacher is a person trained in knowledge, skills, attitude and values, in a formal training institution, to teach or impart same to the learners in the most acceptable way. (Amaele 2014). Asiabaka and Emenalo (2011) described the teacher as the human catalyst who intentionally influences the interaction among teachers, learners and the environment of the learner by restructuring the environment in such a way that the learners will acquire the desired knowledge, skills and attitudes

and meaningfully contribute to the development of humanity at an appropriate time. Hence, the success or failure of any education system depends to a large extent on the quality and calibre of teachers who are the interpreters and transmitters of desirable knowledge, skills, attitudes and values in the society. According to Olaniyan (2013), productivity of teachers might be depicted as the responsibilities executed by an instructor at a particular time in the educational structure in attaining administrative objectives. Productivity is somewhat, what a singular individual does. Execution of the instructors in educational institutions is exceedingly impacted by motivation. The teacher is undoubtedly the most important factor for achieving a profitable learning outcome in every school system. The future of any nation, to a very large extent, is contingent upon the quality of its teachers. Therefore, those to be recruited as teachers should be people who have demonstrated some measure of competence in knowledge and skills as well as possess a healthy attitude for the achievement of the schooling objectives (Emunemu and Isuku, 2020). As the population of school-age children grows, the problem of increased demand for teachers (both qualified and not qualified) also persists, thus, making the teaching profession the largest employment in the world (Babalola, 2015). Nevertheless, in spite of the growing number of teachers in employment, school productivity seemed not to have satisfactorily improved as expected. Productivity is a concept often misinterpreted with efficiency by many people. However, both concepts exhibit similarity, yet they are different economic concepts. In the formal educational system, both concepts each refer to a different relationship between inputs and outputs. Inputs are the resources used to produce education, such as per-student expenditures; student-teacher ratios; teacher education, experience, and salary; school facilities; and administrative factors, the teachers' time; buildings; learning materials; equipment; students, time, etc. (Emunemu and Isuku, 2020). While outputs are the products of education such as the number of students who are educated, their qualifications, their cognitive learning, the cultural, sporting and life skills they have obtained, the welfare services provided by the schools, etc, (Marginson, 2011). It is important to note that output is distinct from objectives. While objectives encompass broad purpose of education service, for example, vocational training, intellectual, physical growth of the students, etc, output, on the other hand, refers to the specific means by which these broad objectives are achieved. For instance, equality of opportunity or access to education is an objective, but achieving a target of 40% female access of the available opportunity in that form of education is an output.

In the school setting, productivity is the extent to which the school management and teachers utilize the available resources to achieve the educational goals. Productivity also means the relationship/ratio between the results achieved (output) and the quantum of resources (input) used in production. It is therefore necessary for the school administration to improve productivity in terms of the quality of teachers' instructional tasks performance and students' learning outcome in the pursuit of educational goals (Kezner, 2016).However, it seems principals are much occupied with administrative duties which make them to give little attention to coordination of teachers' instructional activities and teamwork, while lack of training facilities and paucity of funds incapacitated school principals in organizing seminars, workshops and sponsoring teachers for conferences. This situation often creates inadequacies in instructional resource inputs and processes, and has been partly responsible for the perceived low level of teachers' productivity as evident in the performance of students who obtained credit level passes in five subjects and above, including English Language and Mathematics in the West African Senior School Certificate Examinations which has often been below 50 percent between 2015 and 2017 in Nigerian secondary schools (Ayeni and Sadiku, 2020). In ensuring productivity in school, the principals being the school managers are expected to put in place effective coordination by integrating the various departments, units and sub-units in a unified operation towards ensuring best practices in teachers' instructional tasks performance. The process also involves the linking of objectives, activities and strategies of different work units (departments or functional areas) in a systematic manner, ensuring that competent teachers are appointed as unit heads; the goals and responsibilities are clearly defined and communicated to all members of the school organization. This process reduces administrative bottlenecks, promotes inter-departmental cooperation, facilitates information processing, promotes innovation, and optimal utilization of resources which enable the school organization to consistently improve the quality of instructional resource inputs, process and output for the accomplishment of

the educational goals (Ayeni and Akinfolarin, 2014).Principals' coordinating strategies influence the teachers' productivity in terms of lesson planning and delivery. The grouping of teachers into various departments based on their subject specialization enable the teachers to engage in professional interaction, cross-fertilize ideas, innovative in their instructional methods and classroom management. The effectiveness of teachers in performing their instructional tasks determines the quality of education and students' academic performance in secondary schools. The inability of the school principals to ensure effective coordination may lead to teachers' excess workload and inadequate curriculum delivery which has perhaps been responsible for the relatively low academic performance of students in secondary schools (Ayeni and Sadiku, 2020).

Bua (2013) conducted a study on impact of total quality management (TQM) on teachers' productivity in secondary school in Benue State; the findings showed that educational administrators' commitment and effective communication significantly affect secondary school performance. This implied that effective communication has positive influence on teachers' productivity, while ineffective communication could lower teachers' productivity. Productivity in education takes into consideration the input, process and output phases of education, which determines the overall achievement of the educational objectives (Ayeni, 2018). Teachers' productivity in an educational system depends to a large extent on their competence (quality of knowledge, skills and experience). However, one does not dispute the fact that there are still incompetent teachers in many secondary schools in Nigeria probably due to the challenge imposed by shortage of teachers which makes them to teach subjects that are outside the area of their specializations in most cases. In a study by Oluwakemi (2015) on personnel (teachers) management as determinant of teachers' productivity recommended among others, that teachers needed to acquire more knowledge through in-service training such as seminars, conferences and regular workshops in order to improve their competencies for quality instructional tasks performance. The school principals are expected to properly deployed teachers based on their area of specializations and enhance their professional skills through on-the-job training in order to improve their productivity. It is also expected of the State Government to sponsor teachers on in-service training to improve their competence for higher productivity. Ogunbamerun (2012) investigated the professional and technical competencies needed by teachers in secondary schools in Ondo State, Nigeria; findings showed that teachers needed improvement in instructional planning, curriculum implementation and evaluation skills to facilitate the achievement of the educational goals. Ezeugbor (2017) investigated the application of total quality management principles for continuous improvement of secondary schools in Anambra State. The study revealed among others, that principals provided the opportunity for teachers to acquire on-the-job training that enhanced continuous improvement in secondary schools. However, the study further revealed that teachers are not sponsored for conferences in their area of specializations. This could dampen teachers' morale and impede their productivity in secondary schools. Ayeni and Sadiku (2020) investigated the levels of Total Quality Management and teachers' productivity in secondary schools in Ondo North Senatorial District of Ondo State, Nigeria. Descriptive survey research design was adopted. The sample comprised 30 principals and 600 teachers randomly selected from 30 public secondary schools. Data were collected using Total Quality Management Questionnaire (TQMQ), Teachers' Productivity Questionnaire (TPQ), and Students' Academic Performance Profoma (SAPP). Three research questions and two hypotheses guided the study. Research questions were analyzed descriptively while the hypotheses were tested using Multiple Regression Analysis and Pearson Product Moment Correlation (PPMC) at 0.05 level of significance. Results revealed that the coordination strategy ($\beta = 0.390$), the communication strategy ($\beta = 0.415$), and teamwork strategy ($\beta = 0.439$) had the highest values and positive contributions to teachers' productivity. Capacity development strategy had the least contribution to teachers' productivity ($\beta = 0.099$) at < 0.05. There was a significant relationship between total quality management and students' academic performance [$r = 0.698 > 0.195$]. It was concluded that the level of TQM was above the average and contributed significantly to teachers' productivity. It was therefore recommended that school principals should intensify the use of coordinating, communication and teamwork strategies to improve teachers' productivity. The Ministry of Education should also organize seminars/workshops for principals and teachers to enhance total quality management and productivity in secondary schools.

Teachers' productively is the extent to which the teacher is able to meet with the goals and aspirations of which he was employed (Igwe, 2011). Responding to this, Ebong (2006) defines productivity as the relationship between inputs outputs measured in terms of output per unit input. According to her the most common approach to measure productivity in an educational institution is to compare the output of the system for instance number or percentage of graduates per ratio of applicant enrolled to the number of graduates, number of students per instructor (teacher-student ratio), cost expenditure per student. The absence of these factors in the school will have negative effects on the teachers. No teacher can do his/her job productively when he/she is not properly equipped to do so, being equipped demands that the teachers have at their disposal the where-withal to deliver effectively. For teachers to be productive in their job, the following must be as ingredients in these teachers; effective teaching skills and methods, good classroom management, proper lesson preparation and presentation and effective evaluation of instructional process. However, effective teaching skills and methods are important tools the teacher uses to deliver his lesson in the classroom. Teaching skills according Achuonye (2014), entails the various actions adopted by teacher in cause of teaching to bring about learning in the classroom. Methods are those procedures and ways teaching are carried out by the teacher. Lesson preparation and presentation is key to instructional effectiveness. This is because the teacher does well when he prepares adequately for the lesson and present it as planned.

A major resource input to the secondary education is the teaching manpower made up of teachers. Teachers are one of the most important members of the society and in fact, every successful professional today learnt the art in schools and colleges. The foundation of any subject is strongly laid in educational institutions and teachers play the crucial role. Teachers are role models and sources of inspiration in many aspects. Productive teachers offer many benefits to students with respect to thought-provoking environments, structure and stability, feedback and goal setting, knowledge and skills, analysis of weaknesses, conditions of curiosity, hands-on training, teamwork opportunities, and education as per individual's needs (Shirani et al., 2016). Teachers play a major role in bringing up great citizens in the nation because they know about their student's ability and how to pattern them for better life. Therefore, if teachers are not productive, students will be affected. Oyewole and Alonge (2013), report that, teachers are arguably the most important group of professionals for our nation's future. Teachers' productivity refers to the degree at which teachers discharge their primary duty of teaching and learning, as well as their general attitude towards the teaching profession and her activities (Owan, 2012). Bolarinwa (2016) observes that, the indicators of teachers' productivity are evaluated in the teachers' ability to make a deliberate effort to enhance students' academic performance, possession and display of in-depth knowledge of subject matter, lesson presentation, effective classroom organization and control, and participation in the school curriculum activities.

Others according to the author include regularity and punctuality in the school, maintenance of good interpersonal relationship with subordinates and superiors, discipline, motivation, and counseling of students as well as compliance to teachers' professional codes of conducts among others. Teachers' productivity may also be determined by the teachers' level of participation in the day-to-day administration of the school. Hence, effective use of administrative strategies by principals can therefore encourage effective performance of teachers' academic functions. This can be achieved by the principals through identifying teachers' needs and trying to meet them. The teacher is laden with a lot of responsibilities in the classroom. The society has a very high expectation from the teachers. Hence, there is need for the teacher to perform productively to meet up these expectations. In line with this view, Muheeb (2004) identified three factors which he regarded as criteria for productivity and these are students' examination results, absenteeism and turnover. Others are promotion opportunities, negative incentive which are met to correct the mistakes or default of employees, incentives, non-monetary incentives like Job enrichment, non-financial incentive can be any of the following:

(a) Security of service
(b) Praise or recognition
(c) Suggestion scheme
(d) Job enrichment

(e) Promotion opportunities and so on.

For a teacher to be productive, he must manifest significant qualities as indicated by Denga (2011), Desta (2014) and Kigenyi (2017), such as; emotional and mental stability, knowledgeable of the subject area, ability to teach and explain the lesson in different ways, wider and deeper views of contents, objectivity and fairness, positive attitude, know their students and dedication to excellence

Challenges in 21st Century Teachers Skill and Teachers Productivity

Education frequently takes place under the guidance of educators; however, learners can also educate themselves. Education can take place in formal or informal settings and any experience that has a formative effect on the way one thinks, feels, or acts may be considered educational. The methodology of teaching is called pedagogy. Nwagwu (2020) stated that education in the 21st century has outgrown its twentieth-century meaning. It is time to move beyond measures of disparity by race, ethnicity, and gender to education beyond borders. The 21st century is markedly different from the twentieth, a change of magnitude that could be twice that of the contract between the 19th and the 20th. Population growth pattern and advances' in technology are the key factors in the anticipated rapid transformation. The rapidity of change makes the description of the scenario for the whole of the 21st century rather difficult-like shooting at a moving target. The safer pathways to tread are to look at quarterly milestones/The safest projection to make, therefore, is for the first quarter of the 21st century, anchoring in 2025. The challenge for the teacher is in being able to cope with level of development of younger children (Ezeali, 2014). One of the greatest challenges that the teacher will have to face is a spin-off of "Education for All". In this connection, the teacher will have to contend with teaching underserved groups. Another challenge is that of students with poor attitude to work. The attitude of students to work over the last ten years has been worsening. This trend is likely to continue far into the 21st century. The teacher is then faced with the challenge of coping with truants, disruptive students, and non-challenge to school work. The phenomenon of large classes is also predicted to be a feature of the 21st century classroom. The class sizes will be large relative to the present conditions on account for the anticipated increase in population and as a consequence of the "Education for All" movement. The problems associated with large, classes such as inability to successfully meet the needs of individual students and pedagogical frustration are some of the challenges that the teacher of the 21st century should prepare to face (Onwumere, 2016).The curricula of the millennium will be laden with never concepts in response to changes in the various disciplines. The teacher will have to be prepared to cope with the demands of such never concepts. It is envisaged also that learners will be "smarter" in terms of their intellect. The teacher of the future would then need to be prepared for bright students. The number of such students could be small but they would constitute a group to be reckoned with in their classrooms.

However, the development of many countries largely depends on their level of education. It is popularly asserted that education is the panacea for economic development. In developing countries with developing economies, there are educational challenges of the 21st century which have nexus to certain variables. These include literacy rate through education, energy for development, urbanization, migration, digital divide, ageing population, keeping pace with technological advancement, energy-food-stress, food security, natural hazards, poverty, air pollution, globalization and geo-politics, gender equality in education, economic growth, biodiversity, plastic pollution in oceans, over fishing, deforestation, disappearance of endangered species, low carbon energy, climate change, security challenges and leadership (Nwagwu, Okere & Branch, 2021). Nwagwu and Nwankwoala (2020) stated that the achievement of a developing economy (such as Nigeria) in the midst of these challenges will continue to be a mirage without pragmatic and functional educational system. It is a truism that no country grows or develops above its educational level as managerial abilities require for the control and distribution of resources for appropriate use in the developing economy is a function of educational process. Suffice to say that education is the process of human growth by which an individual gains greater understanding and control over himself and the world, a process and activity characterized by continuous development and changes, the end product of which is learning.

It is a total aggregate of all the processes by which an individual develops abilities, attitudes and other forms of behaviours which are of positive value to the society (Illueme and Kpokpo, 2015). An investment in education pays the best interest. The importance of education to a developing economy

cannot be overemphasized, in most parts of the world; education is regarded as a fundamental human right. Education is one of the basic criteria to measure the growth and development of the nation. Teacher education in Nigeria has not been rosy and that justifies the discrepancies between the desired objectives and the output of the programme. The challenges/shortfalls have become so systemic that one would be tempted to neglect the recommendations from many scholars and studies, since the polity of the country gives a lip praise attention to them. Summarizing the reports of Education Sector analysis, National Teacher Education Policy, Education Support Programme in Nigeria, and Input Visit, as well as the studies of Ajeyalemi and Okebukola (as cited in Adeosun, 2014) the following are evident in teacher education in Nigeria:

There is no congruity between teacher education curriculum and the new age teaching and learning environment which is characterized by constructivist learning, learner-centered instructions and integrating technology into the pedagogical process. A gap exists between the curriculum taught to teacher trainees and the actual teaching experience and environment they are exposed to in schools.

The supposed professional education emphasizes on content delivery, examination and certification at the expense of creativity, innovation and research which are indices of lifelong learning. The only course in NCE curriculum which is Primary Education Studies explicitly set out to prepare students for teaching in the primary school has always gained low enrolment, leaving primary schools with dearth of teachers. There is low quality and quantity of input in teacher training programmes. Learning materials are not consistently available and this makes written materials not to play a coherent and pervasive role in the provision of a strong cognitive and structure-giving basis for the development of the required professional knowledge, skills and attitude of an effective teacher. Lack of professional development opportunities for teachers.

The varying levels of qualifications characterizing teaching profession in Nigeria makes it heterogeneous unlike other established professions who have equivalent level of education and training. For instance private schools' teaching force are predominated by pre-service teachers. In a more succinct manner, Okoli, Ogbonda and Ekpefa-Abdullahi (2015) highlighted that the contemporary Nigerian teacher education are inhibited by problem of quality assurance, insufficient funding, lack of personnel, poor facilities, lack of commitment by government, poor supervision, faulty selection process and poor teacher education curriculum. Emerging Technologies use in the classroom situation comes with its attendant challenges to teachers. Studies have revealed varied degree of efforts put into solving the challenges that exist in integrating technologies into education. Some of the challenges, according to Badri, Mohadiat, Ferrandono and El Mourad (2013) include, budgetary and some are related to skills, attitude and experience. Other challenges according to the study, includes lack of computer, lack of time, technical difficulties, poor funding, resistance to change, poor administrative support, low levels of computer literacy, technology misaligned with the curriculum, lack of incentives, poor training opportunities and lack of vision as to how to integrate technology into learning processes and teacher related difficulties such as negative attitudes, belief and unwillingness towards technology.

Issues that hinder technology use in schools include social and moral ethics like question of inequitable access to technology for all students, which causes some teachers to avoid requiring students to use of technologies to do assignments. Many schools also find it necessary to restrict the use of various technologies due to potential negative consequences and ethicaldilemmas, considering it a moral imperative to monitor internet use and limit students' access to this technology (U.S Department of Education, 2017). Studies have revealed that in most educational institutions, some teachers are intimidated by technology and are very comfortable with their own established teaching methods. Teachers feel threatened by loss of control in the classroom as students who are usually more adept at using technology can quickly access information and challenge the teacher's role as the primary source of information (Hennesy, Yuiko & Harrison, 2014). Other challenges to emerging technology use by teachers include:

1. Pedagogical implications.
2. Impact on the instructions and contents of curriculum.
3. Availability of technology resources for teachers for teaching purposes.
4. In most cases where some of the resources are available, accessibility by teachers for their day-to-day instructional activities becomes a challenge.

5. Teachers' expertise and lack of knowledge (competence) to use and to evaluate the role of emerging technologies, prominently hinders teachers' readiness and confidence in integrating emerging technologies in the classroom.
6. Poor policy framework by government and various institutions.
7. Lack of motivation by the government and the administrations**.**

Theoretical Review

Human Capital Theory

The origin of human capital goes back to the emergence of classical economics in 1776, and thereafter developed a scientific theory (Fitzsimons, 2009). After the manifestation of that concept as a theory, Schultz (1971) recognized the human capital as one of important factors for a national economic growth in the modern economy. With the emergence and development of human capital as a field, some researchers expansively attempted to clarify the human capital could contribute to socio-political development and freedom (Alexander, 2006; Grubb & Lazerson, 2004; Sen, 1999). The concept of human capital can be variously categorized by each perspective of academic fields. The first viewpoint is based on the individual aspects. Schultz (1971) recognized the human capital as 'something akin to property' against the concept of labour force in the classical perspective, and conceptualized 'the productive capacity of human beings in now vastly larger than all other forms of wealth taken together'. The theory holds that people invest in themselves with the hope of increasing their productivity and living standard. Rastogi in Chukwu (2009) conceptualized the human capital as 'knowledge, competency, attitude and behaviour embedded in an individual'. It is the attribute gained by a worker through education and experience. It implies an equation of any expenditure on physical capital in order to yield a stream of benefits, as can be explained in the case of school principals (Gbosi, 2007).

There is the second viewpoint on human capital itself and the accumulation process of it. This perspective stresses on knowledge and skills obtained throughout educational activities such as compulsory education, post-secondary education, and vocational education (De Ia Fuente and Ciccone, 2002, as cited in Alan, Altman, and Roussel, 2008). Human capital theory is used to show that knowledge acquired, skills learned and abilities of an individual make him earn income in exchange for labour. The theory became defined in limited sense of "education embodied in the labour force". Despite the extension of that concept, this perspective neglects that human being would acquire knowledge and skills throughout his/her own experience. The third is closely linked to the production-oriented perspective of human capital. More recently, Frank and Bemanke in Chukwu (2009) defined that human capital is 'an amalgam of factors such as education, experience, training, intelligence, energy, work habits, trustworthiness, and initiative that affect the value of a worker's marginal product'. Considering the production-oriented perspective, the human capital is 'the stock of skills and knowledge embodied in the ability to perform labour so as to produce economic value' (Sheffm, 2011). Furthermore, some researchers defined that human capital is 'the knowledge, skills, competencies and attributes in individuals that facilitate the creation of personal, social and economic well-being' with the social perspective (Rodriguez & Loomis, 2013). Consequently, human capital simultaneously includes both of the instrumental concept to produce certain values and the 'endogenous' meaning to self-generate it. In order to dependently/independently create these values, there is no doubt that leaning through education and training can be an important in terms of defining the concept of human capital. Considering that experience can be included as a category of knowledge, the human capital is a synonym of knowledge embedded in individuals is based on the economic self-interest of individuals operating within freely competitive markets.

A prominent explanation for that move is provided by a recent reformulation of Human Capital Theory which stresses the significance of education and training as the key to participation in the new global economy. In terms of structural reform, under the capacity theory, the basis for nation state structure policy frameworks as the enhancement of labour flexibility through regulatory reform in the labour market, as well as raising skill levels by additional investment in education, training and employment schemes and immigration focused on attracting high quality of human capital. The success of any nation in terms of human development is largely dependent upon the physical and human capital stock. In short, the human capital theorists argued that an educated population is a

productive population. Human capital theory emphasizes how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability, which is a product of innate abilities and investment in human beings. The provision of formal education is seen as a productive investment in human capital which the proponent of the theory have considered as equally or even more equally worthwhile than that of physical capital.There are several ways of modeling how the huge expansion of education accelerated economic growth and development. The first is to view education as an investment in human capital. A different view of the role of education has positive externalities. Education is part of the community and the whole of it benefits. The idea that education generates positive externalities is by no means new. Many of the classical economists argued strongly for government's active support for education on the grounds of the positive externalities that would gain from a more educated labour force and populace (Van-Den-Berg, 2011). From this perspective, education is seen as an intentional, effort to increase the resources needed for creating new ideas and thus, any increase in education will directly accelerate technological progress. According to Ebong (2015), the concept of human capital was later developed by Schultz 1971 and Becker in 1975 who through analysis, treated education and training as investment aimed at producing higher benefits for the educated person. The theory of human capital is tied to educating the people so as to achieve socio-economic development and that development cannot take place if the human capital that is necessary to bring about progressive change in the economy is not available. Gbosi (2007) posited that the theory of human capital revolves on how to measure benefits from education which provides opportunity for individuals to invest in themselves. As a matter of fact, the demand for university education can be used as an illustration for human capital theory. To some individuals, the benefits may be short term or long term, but the theory of human capital is associated with long term benefits in form of higher wages. He further stressed that human capital refers to the productive skills and degree of knowledge possessed by individual workers and it is acquired by the expenditure of money usually tuition payment on education and training. He also pointed out that the level of development in any society is a function of the level of manpower produced within that society. The concept of human capital implies that an individual's decision to invest in training is based upon an examination of the net present value of the cost and benefit of such an investment. Individuals are assumed to invest in training during an initial period and receive returns on investment in subsequent periods. The issue is determining the most effective ways to use the least resources to create human capital through human development strategies. Human capital must be trained, educated and developed within the system of an organization for the purpose of enhancing productivity of the organization through the expertise of its workforce (Zidan, 2011).

Education is essential not only to enable people to share in the benefits of progress, but also to enable economies to ensure sustained development through competitiveness based on more intense knowledge use (ECLAC, 2003). It is for these very reasons that education is one of the pillars of proactive social policy aimed at the implementation of the universal principles enshrined in the human rights declaration and United Nation's World Summit of 2002. Education is deemed an investment, equipping individuals with knowledge and skills that improve their employability and productive capacities, thereby leading to higher earnings in the future (Trostel, Walker and Woolley, 2012). Human capital refers to the ability and efficiency of people to transform raw materials and capital into goods and services and the consensus is that those skills can be learned through the educational system. Human capital development is important for development for its intrinsic value as a development goal in its own right (Cohen & Soto, 2017). The human capital theory emphasizes the need for policy makers to allocate significant resources to the expansion of educational systems. Hence, human capital has relatively more important in labour surplus countries. Thus, human resources can be transformed unto human capital with effective inputs of education, health and moral values. The transformation of raw human resources into highly productive human resource with these inputs is the process of human capital formation. The process of human development is the strong foundation of a continuous process of economic development of a nation for a long period of time. The significance of the concept of human capital in generating long-term economic development of the nation cannot be neglected. It is expected that the macroeconomic policies of all the nations are focused towards promotion of human development. Human capital can be expanded

by either endogenous or exogenous factors. It is possible that original knowledge can be continuously elaborated and developed through the relationship between external knowledge, information, skills, experiences, and other knowledge-based factors as well. Plecki (2010) examined ways researchers have used productivity and human capital theory to measure return on investments in teacher capacity building. Therefore, it is imperative to note that human capital is the backbone of human development and economic development in every nation. In other words, when teachers acquire more skills and knowledge, it will translate to better outcome of students, which will in return benefit the nations' economy. This implies that when teachers' skills are developed, it will also impact on the kind of knowledge students receive from them**.**

METHODOLOGY

The design for the study was correlational. The correlational research design was considered appropriate because it made it possible to establish relationship both singularly and jointly between 21st century teacher's skills of Information Technology, communication, innovative, entrepreneurial, emergency problem solving and soft skills and teacher productivity in secondary schools. The population of the study comprised the teachers in the public senior secondary schools in Rivers. According to Rivers State Secondary Education Management Board (20240 there are 6920 teachers in the public senior secondary schools. The sample of the study comprised 692 teachers drawn from the population of 6893 teacher from the public senior secondary schools in Rivers. They were selected using the stratified random sampling technique. Respondents of the study responded to two sets of instruments. These were the 30-item 21st Century Teachers Skills Scale (21st CTSS) and the 10-item Teacher Productivity Scale (TPC), designed by the researcher in the modified 4-point Likert scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE) for 21st TSS and Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The instruments had three sections. There were Section A, B And C. Section 'A' sought information biographical information on the respondents; Section B, sub-divided into sub-sections B1 to B6, sought information on the 21st Century Teachers Skills of Information Technology, communication, innovative, entrepreneurial, emergency problem solving and soft skills while section C with 22 items sought information on teacher productivity. In order to ascertain the face and validity of the newly constructed instruments, the researcher presented two sets of two instrument containing 20 and 10 items respectively to the research supervisors for sanctioning. Three (3) other experts in educational management and educational measurement and evaluation also moderated the instruments. The scrutiny and moderation by the supervisors and moderators reduced the number of items on the 21CTS to 20 and TPS to 10. Added to these, all the corrections, ailments, modifications and commenting were adhered to and incorporated into the final draft of the instruments before being administered to the respondents of the study. In order to obtain the reliability co-efficient of the instruments, the researcher administered 30 copies of the instruments to 30 teachers who were not included as sample of the study. On successful retrieval of the copies, they were coded and Cronbach Alpha statistical used in the analysis of the result. The Cronbach Alpha Module was considered appropriate because the instruments were administered once, were dichotomously scored could measure to produce inter-item reliability apart from the fact that the instrument were in section. On completion of the statistical analysis, the reliability came out as follows: 21st Century Teachers Skills Scale-0.83, i. Information Technology Skills-0.81, ii. Communication Skills-0.8, iii. Innovative Skills-0.78, iv. Entrepreneurial Skills0.72, v. Emergency Problem Solving Skill-0.72, vi. SoftSkills-0.71, Teacher productivity scale -0.90, These individual and general co-efficient made the instruments to be considered reliable for gathering data for the study, The instruments of the study were self-administered to the respondents by the researcher with assistance from 6 research assistants who were briefed on their expected roles. In all, 692 (100%) copies of the instruments were administered while 691 were retrieved. The shows 99.86 retrieval rate the instrument was later subjected to coding after which 2 sets were discarded as a result of errors in responses leaving a remainder of 689, which represented 99.57 and 99.71 of the total number of copies administered and retrieved. The remaining 689 were used in the statistical procedures for answering the research questions and testing the hypotheses.

RESULTS AND DISCUSSION

Answers to Research Questions

Research Question 1: *To what extent do 21st Century Teacher Information Technology Skills relate with Teacher Productivity in Public Senior Secondary Schools in River State.*

Table I: Summary of Simple Regression Analysis on the Extent to which 21st Century Teachers' Information Technology Skills relate with Teacher Productivity in Public Senior Secondary Schools in Rivers State.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766[a]	.587	.587	2.63502

Scale of Measurement

0 – 25%	Very Low Extent (VLE)
26 – 50%	Low Extent (LE)
51 – 75%	High Extent (HE)
76 – 100%	Very High Extent (VHE)

Data on Table I presents the summary of simple regression analysis on the extent to which 21st Century Teachers' Information Technology skills relate with teacher productivity in public senior secondary schools in Rivers State. With the model as I, the regression value resulted in .776a, the regression square as .587, the adjusted regression square as .587 and standard error of estimate as 2.63409. The foregoing information shows the co-efficient of determination of 58.7% (high extent) as derived from the regression square. When reference is made to the table of measurement, 58.7% is situated between 51-75% (high extent). As can be seen, this result suggests that the extent of relationship between 21st Century Teachers' Information Technology skills and teacher productivity is to a high extent. In the light of the observations, the researcher ascertained that, 21st Century Teachers' Information Technology skills relate with teacher productivity in public senior secondary schools in Rivers State to high extent (58.7%)

Research Question 2: *To what extent do 21st Century Teacher's communication skills relate with teacher productivity in public senior secondary schools in Rivers State?*

Table 2: Summary of Simple Regression Analysis on the Extent to which 21st Century Teachers' Communication Skills Relate with Teacher productivity in Public Senior Secondary Schools in River State.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.853[a]	.728	.728	2.13945

The Table of Measurement for Table I applies

Data on Table 2, present the summary of simple regression analysis on the extent to which 21st Century Teachers communication skills relate with teacher productivity in public senior secondary schools in Rivers State. With the model as I, the regression value came out as .853a, regression square as .728, adjusted regression square as .728 and the standard error of estimate, as 2.13945. The foregoing information show the co-efficient of determination as 72.8% (high extent) as derived from the regression square. When reference is made to the scale of measurement, 72.8% falls between 51 – 75% (high extent).

As can be seen, the result suggests that, the extent of relationship between 21st Century Teachers' Communication skills and teacher productivity is to a high extent. Consequently, the researcher ascertained that, 21st Century Teachers' communication skills relate with teacher productivity in public senior secondary schools in Rivers State to a high extent (72.8%).

Test of Hypotheses

Hypothesis I: There is no significant relationship between 21st Century teachers Information Technology skills and teacher productivity in public senior secondary schools in Rivers State.

Table 8: Summary of t-test Associated with Simple Regression on the Relationship between 21st Century Teachers Information Technology Skills and Teacher Productivity in Public Senior Secondary Schools in Rivers State.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.314	.649		17.446	.000
	technology	.735	.019	.766	37.955	.000

Data on Table 8 present the summary of t-test Associated with simple regression on the relationship between 21st Century Teachers Information Technology Skills and teacher productivity in public senior secondary schools in Rivers State. With 689 respondents, the calculated t-test value associated with simple regression used in testing the hypothesis resulted in 37.955. Using 687 degrees of freedom, 0.05 level of significance and .000 significant value. At .000 significant value, 0.05 level of alpha significance, and 687 degrees of freedom, the obtained t-test value of 37.955 is rejected because the significant value of .000 is less than the alpha value of 005. This suggests that there is a significant relationship between 21st Century Teachers Information Technology Skills and Teacher Productivity. Based on the foregoing observation, the researcher rejected the null hypothesis in favour of the alternative that there is significant relationship between 21st Century Teachers Information Technology Skills and teacher productivity in public senior secondary schools in Rivers State.

Hypothesis 2: There is no significant relationship between 21st Century Teaches Communication Skills and teacher productivity in public senior secondary schools in Rivers State.

Table 9: Summary of t-test Associated with Simple Regression on the Relationship between 21st Century Teachers Communication Skills Relate with Teacher Productivity in Public Senior Secondary Schools in Rivers State.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.134	.554		12.887	.000
	communication	.811	.016	.853	52.042	.000

Data on Table 9 present the summary of t-test associated with simple regression on the relationship between 21st Century Teachers communication skills and with teacher productivity in public senior secondary schools in Rivers State. With 689 respondents, the t-test value calculated and used in testing the hypothesis came out as 52.042, using 687 degrees of freedom, 0.05 level of significance and a significant value of .000. At .000 significant value, 0.05 level of alpha significance and 687 degrees of freedom, the obtained t-value of 52.042 is rejected because the significant value of .000 is less than the alpha value of 0.05. This suggests that there is a significant relationship between 21st Century Teachers Communication Skills and teacher productivity in public senior secondary schools in Rivers State. Based on the foregoing observations, the researcher rejected the null hypotheses in favour of the alternative that, there is a significant relationship between 21st century teacher's communication skills and teacher productivity in public senior secondary schools in Rivers State.

DISCUSSION OF FINDINGS

21st Century Teachers Information Technology Skills are Teacher Productivity in Public Senior Secondary Schools in Rivers State.

The first finding of the study is that 21st century teachers Information Technology skills relates with Teacher productivity in public senior secondary schools in Rivers State to a high extent (58.7%). Also, a corresponding finding from the test of hypothesis established that there is a significant

relationship between 21st century teachers' information technology skills and teacher productivity in public senior secondary schools in Rivers State. These findings are in agreement with Zanwra and Zamora (2022), Kengire, Orchwari and Wachura (2008), Kosma (2023) Berry and Team (2011), Schleatiz (2011), Jaubs (2010), Frye (2013) Taylor and Diran (2016), Sheffield (2014), Nelisa (2014), Samier Mensour and Syed (2014), Simun and Wan (2015) Ibrahim (2015) Jerron (2019), Eremie and Agi (2020). Emitah (2016), Ngugi (2016) and Ligondo (2019). The schools and researchers in their scholarly and empirical contribution have established linkages between teachers Information Technology skills and teacher productivity in educational institution. A possible explanation for the direction of the finding, may be in the fact that, teachers have acquired information technology skills through their exposures to ICT trainings organized by the Rivers State Ministry of Education in recent times and have made us of the acquired skills in teaching. These findings imply that, educational institutions that want to raise the productivity levels of their teachers should organize Information Technology training programmes for them.

21st Century Teachers Communication Skills are Teacher Productivity in Public Senior Secondary Schools in Rivers State.

The second finding of the study is that 21st century teacher communication skills relate with teacher productivity in public senior secondary schools in Rivers State to a high extent (72.8%). Also, a corresponding mirth finding ascertained that there is a significant relationship between 21st century teachers' communication and teacher productivity in public senior secondary schools in Rivers State. There finding corroborate Ibrahim (2016), Ijaiya (2013), Ogunsanya (2013), Mbiti (2010), Wilber (2015), Morgan (2015), Nwankwo and Luiaggel (2018), Garnet, Marlowe and Randy (2015), Harold (2010), Gardner, Rauben, Galious, Callan and Monaghan (2017), Darling Hammand (2015) Freddi – Harmand (2015), Umansanke and Prenab (2006) Dada(2014), Nnamani & Oyibe (2016), Kiddere (2017), Zawara and Zamora (2022) and Ayeni (2020). The scholars and researchers have in their scholarly and empirical academic contribution established relationships between teachers' communication skills and teacher productivity. A possible explanation on the direction of the finding may be in the fact that in contemporary times, teachers are exposed to different means of communications and have garnered different experiences from the various forms of interaction they have been involved in. Also, contemporarily, teachers are expected to use different media in their communication to their students.These findings simply that teachers who are exposed to different means of communication are sure of being productive in the performances of their functions.

CONCLUSION

This study investigated the impact of 21st-century teaching skills on teacher productivity in public senior secondary schools in Rivers State. The findings underscore the transformative role that 21st-century teaching skills play in shaping the professional efficacy and outcomes of teachers. Critical competencies such as digital literacy, collaborative teaching, critical thinking facilitation, and adaptive pedagogy were found to significantly enhance teachers' ability to deliver effective instruction, engage students, and achieve educational goals. The study revealed that teachers equipped with these modern skills demonstrated higher levels of productivity, reflected in improved student outcomes, enhanced instructional strategies, and better alignment with global educational standards.

The integration of 21st-century teaching skills also fosters a collaborative and innovative school culture, enabling teachers to address contemporary challenges such as diverse student needs, technological advancements, and evolving curricular demands. Despite these benefits, the study highlighted gaps in training, resource availability, and administrative support, which impede the widespread adoption of these skills. Addressing these barriers is crucial for maximizing teacher productivity and sustaining the relevance of public secondary schools in an increasingly competitive global educational setting.

RECOMMENDATIONS

The study of the findings recommended as follows:

1. Ministries of education and school administrators should establish mandatory and continuous professional development programs focused on equipping teachers with 21st-century teaching skills such as digital literacy, collaborative techniques, and student-centered approaches.
2. Schools should prioritize investments in ICT infrastructure and provide teachers with access to digital tools, including smartboards, educational software, and high-speed internet, to facilitate modern teaching practices.
3. Educational policymakers should revise secondary school curricula to incorporate modules on critical thinking, problem-solving, and collaboration, ensuring alignment with 21st-century teaching paradigms.
4. Teacher training institutions should incorporate 21st-century skill development into pre-service programs, ensuring that newly qualified teachers are well-prepared to meet contemporary educational demands.
5. Governments and school administrators should allocate sufficient funds for the acquisition of modern teaching aids, ensuring that educators have the tools necessary to implement innovative instructional strategies effectively.
6. School leadership should foster an environment that encourages innovation, creativity, and collaboration among teachers, providing support for experimentation with new teaching methodologies.

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