

# MANAGEMENT OF TEACHERS' DIGITAL COMPETENCES FOR IMPLEMENTATION OF TECHNOLOGY-DRIVEN CLASSROOMS IN SECONDARY SCHOOLS IN RIVERS STATE, NIGERIA

**Chinyere Catherine UKALA**

Department of Educational Management  
Faculty of Education  
University of Port Harcourt, Nigeria.  
[kateukala@gmail.com](mailto:kateukala@gmail.com)

**Franca Ginikachi ADIEME**

Department of Educational Management  
Faculty of Education  
University of Port Harcourt, Nigeria.  
[frankiegee24k@yahoo.com](mailto:frankiegee24k@yahoo.com)

---

## ABSTRACT

This study examined Management of Teachers' Digital Competences for Implementation of Technology-driven Classrooms in Secondary Schools in Rivers State, Nigeria. Two research questions and two null hypotheses guided the study. Descriptive research design was adopted for the study. The population comprised all the 311 principals in the 276 public senior secondary schools in Rivers State. Out of these 311 principals, 179 are males and 97 are females. Taro Yamane's formula was used to determine a minimum sample size of 30; hence, a sample of 193 principals (125 males and 68 females), which represents 70% of the population was drawn using both the simple random sampling and proportionate stratified random sampling techniques. The instrument that was used for data collection was a self-designed 15-item questionnaire entitled: "Management of Teachers' Digital Competences for Implementation of Technology-driven Classrooms Questionnaire (MTDCITCQ)." The questionnaire was structured after the four-point modified Likert rating scale, and was duly validated by three experts. The reliability of the instrument was tested using the Cronbach's Alpha method, and the coefficients of .760 and .730 were obtained for the two clusters respectively. Mean and standard deviation were used to answer the research questions while z-test was used to test the null hypotheses at .05 level of significance. The findings of the study revealed, among others, that supervision and professional development programmes are very critical to teachers' digital competences in the actualisation of technology-driven classrooms in secondary schools in Rivers State. Based on the findings, it was recommended, among others, that teachers should regularly undergo professional development programmes on digital pedagogical competences in order to enable them to effectively integrate modern technological devices that will make the students participate actively in the classrooms.

**Keywords:** Management, Teacher, Digital, Competences, Implementation, Technology-Driven, Curriculum, Classroom.

Reference to this paper should be made as follows:

Ukala, C. C., & Adieme, F. G. (2025). Management of teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State, Nigeria. *International Journal of Institutional Leadership, Policy and Management*, 7(1), 49-60.

---

Copyright © IJILPM 2025.

## INTRODUCTION

Education is regarded as an instrument per excellence for meeting the needs, aspirations and solving the problems of the wider society. The Information Age, which was regarded as the computer literacy period has paved way for this Digital Age that is widely accepted as computer competency era. With the emergence of modern digital technologies coupled with the impacts of Corona Virus Disease 2019 (COVID-19) on education, the knowledge-based society has been agitating for digitalization in the education sector in order to equip students with the digital competences they need to be self-reliant in the world of work. More so, the Federal Republic of Nigeria has mandated educational managers to ensure technology-driven classrooms in this 21<sup>st</sup> century (Federal Ministry of Education, 2015). Hence, this has resulted in seismic shift to digital learning in the education system. In other words, this smart age also requires smart leadership in order to bring out the best from teachers. Falloon (2020) posited that there is need for teachers to be digitally competent in using digital tools to facilitate learning in the classrooms. Thus, teachers, who are implementers of the school curriculum, are required to be adept or well-versed in integrating modern digital devices in the teaching-learning process in order to equip students with the basic competences they need in a digitalized world.

In recognition of the prominent role of Information and Communication Technology (ICT) in advancing knowledge and skills in the modern world, the Nigerian Government stipulated in the National Policy on Education that modern technological devices shall be provided and used in instructional delivery at all levels of the education system in order to produce computer literate students, who should be able to use computers in various ways of life (Federal Republic of Nigeria, 2014). Similarly, United Nations Educational, Scientific and Cultural Organisation (2011) asserted that teachers' digital competencies must revolve around ICT operational skills and continuous teacher professional development. Rajesh and Lakshmi (2021) observed that advances in digital education have opened up many avenues of learning. Similarly, Hakasson and Pettersson (2019) noted that the digital education system has revolutionized the traditional methods of chalk and blackboard process of learning in classrooms. Thus, school administrators should adopt digital learning in their schools, and encourage teachers to integrate them in the classrooms.

Technology-driven classrooms entail teaching with technological devices in the classrooms so as to engage all learners actively in the teaching-learning process. Hu et al. (2021) viewed a technology-driven classroom as the use of technology during instructional delivery in order to drive engaging learning experiences. The Federal Ministry of Education (2015) stipulated that one of the guidelines for inclusive practices is ensuring that the classrooms of the 21st century are entirely technology-driven. In this 21st century, the instructional delivery process has changed to the extent that teachers are required to possess generic digital skills to remain competitive in the education sector. These digital skills include but not limited to: use of digital multimedia to communicate and work collaboratively; application of digital devices to gather, evaluate, and use information; critical thinking skills, gamifications, research and problem-solving skills and integration of digital devices to present lessons in the classrooms (Pettersson, 2021; Ukala & Adieme, 2021). Prensky (2001) emphasized that the drastic changes in education has placed new demands on teachers, who are digital immigrants to think creatively, innovatively, critically and above all, to gain digital competence in their instructional delivery. In the same vein, Obanya (2014) maintained that nobody uses yesterday's tool for today's business and expects to be in business tomorrow. Hence, if teachers who are living in today's world must

fit into the world of tomorrow, they must require exposure to some technology-pedagogical knowledge and skills that will make them competent to transfer the kind of knowledge that today's smart age young school leavers need to succeed, lead and contribute in an interconnected-networked world.

Teachers are the most critical and important assets of the school organisation. They are the major actors in any educational reform. According to Obanya (2014, p.455), "teachers are key factors in the education process and every meaningful reform of education should always pay due attention to the teacher factor." Teachers' roles in the teaching-learning process are multifaceted: they are the instructional facilitators, the curriculum implementers, the counselors, the classroom managers, among others. Because of the numerous roles teachers play in achieving educational objectives and goals, their engagement in qualitative education delivery is critical. Thus, the emergence of new technologies and e-Learning software has added to the teacher roles. Zalat et al. (2021) observed in their study that the lockdown of the education system during COVID-19 pandemic has stimulated the growth of online educational activities. Lending credence to this assertion, Dhawan (2020) emphasized that COVID-19 pandemic has paved way for introducing compulsory digital learning in our classrooms. In another dimension, Eze, et al. (2021) pointed out that prior to the COVID-19 pandemic, the Nigerian education system has been dependent on the traditional method of teaching and learning in public primary and secondary schools. Thus, the paradigm shift to blended learning, which is one of the fastest growing trends in education, needs school administrators to harness the teachers towards integrating digital devices while implementing the curriculum.

Curriculum can be viewed as a plan for learning, which guides teachers to give students worthwhile experiences in the school. A curriculum is reviewed in response to societal needs of a particular time and context (Kurasha & Chabaya, 2013). Bloom (2006), as cited in Ofojebe, (2014) viewed curriculum as dealing with all the experiences a learner has to undergo under the guidance of the school. In the Nigerian secondary education system, the curriculum developers are making concerted efforts to revolutionize the curriculum towards a technology-based one. Implementation in the educational system is the process of carrying out a plan, a policy, a programme, a task, an initiative, a decision, among others, that are geared towards achieving educational objectives and goals. Zanzali (2003) as cited in Sabola (2017) defined curriculum implementation as the transformation of the aspirations of the curriculum developers into a form that can be understood by the students. Okoro (2013) described curriculum implementation as the means by which teachers translate the hopes of the society into a concrete reality. Hence, school managers have the arduous tasks of ensuring that teachers acquire the digital knowledge, competences and attitudes needed to implement the curriculum effectively in this digital era.

Competence is needed in all works of life in organizations. In the education sector, teachers are required to be competent to make the teaching-learning process students-centred. In Nigeria, the educational managers are mandated to enhance teaching and improve the competence of teachers (FRN, 2014). According to Butler et al. (2020), teaching is centred on innovation and generation of novel ideologies. In this 21<sup>st</sup> century, teachers are expected to prepare students for a world that is constantly changing and requires creativity (Falloon, 2020). In corroboration, Rajesh and Lakshmi (2021) asserted that the society is in dire need of qualified and experienced teachers, who will develop students that can be digitally competent. Jahnke (2017), as cited in Pettersson (2021) observed that rapid growth and enhanced access to technologies are posing new challenges to teaching and learning. Similarly, Butler revealed that several researchers report that digitalization initiatives have difficulty gaining sustainability in

schools because of teachers' lack of digital competences. Thus, the adoption of digital technologies in schools lies in the hands of school administrators, who are expected to supervise and constantly train teachers on the usages of digital devices.

Digital competency refers to one's ability to effectively use various digital technologies such as computers, mobile devices, the Internet, among others, to solve a problem. Ilomaki and Lakkala (2018) viewed teachers' digital competency as understanding the *hows* (technical) and *whys* (technological) of digital technology in the classroom. It is pertinent to note that quality education depends on teachers' pedagogical competences. Hinrichsen and Coombs (2013) emphasized that teachers' digital competences are the pedagogical understanding of using technologies in education to promote collaboration skills, and capabilities to work creatively with knowledge. Falloon (2020) defined teachers' digital competency as the ability of teachers to use digital devices and software to access, work with and evaluate information for a range of curriculum and teaching purposes. Ghavifekr and Rosdy (2015) discovered in their study that teachers' well-equipped preparation with ICT tools and facilities is one of the main factors in success of technology-based classrooms in Malaysia. Janssen et al. (2013), as cited in Falloon (2020) opined that the notion of digital competence implies a need for constant reflection of changes and evolving nature of technologies. Hence, in this digital age, teachers should develop a positive mind-set towards technological innovations so as to enable them to upgrade themselves to rapidly changing educational environments.

Management is the systematic planning, organizing, coordinating and controlling of available human and material resources to efficiently and effectively achieve organisational goals. In school organisation, the management lies solely on the school administrators who manage the school and harness the human resource (teaching and non-teaching staff) in order to attain the educational objectives and goals. These school administrators are referred to as principals in Nigerian secondary schools. The principals are expected to possess the managerial skills – conceptual, human and technical, and keep abreast of the novel concepts, changes and innovations in the education system.

Nwideduh and Adieme (2021) posited that school managers, as change agents are charged with the inundate tasks of adapting and adopting innovations that are geared at meeting the demands of globalisation and societal expectations of schools. Similarly, Kochhar (2000) as cited in Adieme and Asuku (2020) stressed that the success or failure of a school depends on the supervisory skill, knowledge, personality and professional development of the school administrator. Thus, the principals are expected to adopt digitalization in their schools. Managing teachers' digital competences refers to strategies and procedures required by school managers to supervise, guide and stimulate teachers to adopt and integrate technological devices in the teaching-learning process.

One of the task areas of educational management is curriculum and instruction. For principals to manage teachers' digital competences effectively, they need to constantly monitor the implementation of the curriculum through classroom supervision. Supervision in schools can be viewed as a way of guiding, stimulating, advising, improving and coordinating teachers towards the attainment of the educational goals and objections. The National Policy on Education stipulates that one of the objectives of secondary education is to equip students to live effectively in our modern age of science and technology (FRN, 2014). If students must be equipped to function effectively in this digital age, supervision of teachers' pedagogical competences should be prioritized in the education system. Adieme and Asuku (2020) posited that in carrying out the supervisory roles, the school heads should help both new and experienced

teachers with planning their schemes of work and lesson notes and also guide them on how best to facilitate the teaching-learning process. The findings of Syomwene (2013) revealed that inefficient school leadership and management failed to provide adequate supervision of classroom teaching to ensure effective curriculum implementation in Kenyan schools. Sabola (2013) conducted a study on implementation of curriculum in secondary schools in Malawi, and discovered that monitoring curriculum implementation through regular supervision helps to promote good pedagogical practices, discourages unprofessional practices and provides teachers with relevant information for their professional development.

Professional development on digital knowledge and skills are central to keeping teachers abreast of the evolving technological changes, and how to integrate them in the classrooms in this 21<sup>st</sup> century. Nabunya et al. (2019) defined professional development as mentoring, training, coaching, workshops, group participations and other professional development practices managers adopt to ensure that their staff are performing optimally in organisations. Imo et al. (2013) and Amadi and Promise (2013) discovered in their different studies that in-service training, workshops, seminars, curriculum change and innovation in teaching methodologies enhance teachers' skills and service delivery in Nigerian secondary schools. Thus, teachers' ability to deliver effectively in this digital era depends on their professional development on digital competences.

Guedes and Milton (2018) observed that professional development training programmes for teachers played a key role in enhancing students' quality learning in Mozambique. Falloon (2020) posited that schools should invite information technology (IT) experts to regularly train the teachers on how to effectively teach using the constantly evolving technological devices. Rajesh and Lakshmi (2021) pointed out that digital learning needs a blend of technologies, instructions, and digital contents. Pettersson (2021) emphasized that pedagogical digital competences of teachers can be improved upon only if there is adequate provision of digital devices and development of digital learning platforms. Hence, the school administrators should ensure that teachers are constantly trained and retrained on digital competences in order not to be swept away by the digitalization tide.

## **Statement of the Problem**

The issue of digitalizing the education system has become a global concern. In fact, many nations are reviewing their education curricula so as to better prepare students, who inhabit a virtual world, with digital knowledge and skills they need now and in the future. The Nigerian Government has been making concerted efforts through policies, bye-laws, provision of computers, among others, to ensure technology-driven classrooms. However, it appears that teachers' inabilities to engage in an online classroom environment undermine the Government's efforts. Educational stakeholders are worried that using 19<sup>th</sup> century tools and skills to teach in this 21<sup>st</sup> century will leave many students in Nigeria, particularly in Rivers State behind in this digital era. The seismic shift to teaching with modern technologies has placed new roles and demands on public secondary school teachers to change from the traditional methods of teaching with textbooks, chalk/blackboards to blended learning in the classrooms. Hence, the researchers are worried about how teachers, who are digital immigrants, can effectively facilitate digital learning to students, who are digital natives in this 21<sup>st</sup> century. This, however, underscored the problem of this study.

## **Aim and Objectives of the Study**

The aim of this study was to investigate how teachers' digital competences are managed for implementation of technology-driven classrooms in secondary schools in Rivers State, Nigeria. Specifically, the study sought to:

1. Identify ways supervision can enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State; and
2. Examine how professional development programmes can improve teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State.

## **Research Questions**

The following research questions guided the study:

- In what ways can supervision enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State?
- How can professional development programmes improve teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State?

## **Hypotheses**

The following null hypotheses were formulated at .05 alpha level:

- There is no significant difference between the mean ratings of male and female principals on ways supervision enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State.
- There is no significant difference between the mean ratings of male and female principals on how professional development programmes improve teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State.

## **METHODS**

This study adopted descriptive research design. The population comprised all the 276 principals in the 311 public senior secondary schools in Rivers State. Out of these 311 principals, 179 are males and 97 are females. Again, 236 principals are in the rural schools while 40 principals are in the urban schools (Rivers State Ministry of Education, 2020). Taro Yamane's formula was used to determine a minimum sample size of 30; hence, a sample of 193 principals (125 males and 68 females), which represents 70% of the population was drawn using both the simple random sampling and proportionate stratified random sampling techniques. The instrument that was used for data collection was a self-designed 15-item questionnaire entitled: "Management of Teachers' Digital Competences for Implementation of Technology-driven Classrooms Questionnaire (MTDCITCQ)." The questionnaire was structured after the four-point modified Likert rating scale of Strongly Agree = 4 points, Agree = 3 points, Disagree = 2 points and

Strongly Disagree = 1 point, respectively. The instrument was duly validated by three experts in Test and Measurement Department and Educational Management Department of Faculty of Education, University of Port Harcourt. The reliability of the instrument was tested using the Cronbach's Alpha method to establish the internal consistency of the questionnaire items, and the coefficients of .760 and .730 were obtained for the two clusters respectively; hence, they were adjudged to be reliable for the field study. Mean and standard deviation were used to answer the research questions while z-test was used to test the null hypotheses at 0.05 level of significance.

## RESULTS

**Research Question One:** In what ways can supervision enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State?

Table 1: Mean Scores and Standard Deviations on the Opinions of Male and Female Principals on Ways Supervision Enhance Teachers' Digital Competences for Implementation of Technology-driven Classrooms in Secondary Schools in Rivers State

S/N	Ways Supervision Enhance Teachers' Digital Competences Include:	Male Principals		Female Principals		$\bar{X}_1$ $\bar{X}_2$	Decision
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>		
1.	I conduct regular classroom visitations to ensure that teachers utilize available digital devices during instructional delivery.	3.03	0.63	3.01	0.85	3.02	Agree
2.	I ensure that teachers browse the Internet for new topics before they develop their notes of lessons.	2.74	0.65	2.77	0.88	2.76	Agree
3.	I guide teachers in preparing PowerPoint slides for their lessons, which they present during the teaching-learning process.	2.58	0.67	2.55	0.91	2.57	Agree
4.	I encourage teachers to make their lessons activity-based by integrating technological devices.	2.88	0.64	2.79	0.88	2.84	Agree
5.	My school has learning management system (LMS) where teachers also accesses resource materials.	1.73	0.74	1.69	1.02	1.71	Disagree
6.	I demonstrate to teachers how digital devices can be integrated in the teaching-learning process.	2.71	0.65	2.75	0.89	2.73	Agree
7.	I ensure that teachers type their lesson notes, which they must send to me via my email address.	2.34	0.69	2.37	0.93	2.36	Disagree
8.	I guide teachers on how to integrate gamified learning in the classrooms.	2.16	0.70	2.11	0.96	2.14	Disagree
<b>Aggregate Mean and SD</b>		<b>2.52</b>	<b>0.67</b>	<b>2.51</b>	<b>0.92</b>	<b>2.51</b>	<b>Agree</b>

Table 1 shows the mean responses of male and female principals on ways supervision enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State. Both male and female principals agreed on items: 1, 2, 3, 4 and 6 in the Table with mean scores greater than the criterion mean of 2.50. However, they disagreed on items: 5, 7 and 8, which are less than the criterion mean of 2.50. Their aggregate mean scores of 2.52 and 2.51 respectively, indicate that they agreed that supervision can help teachers to improve on their digital pedagogical competences in the classroom. These include: conducting



regular classroom visitations; ensuring that teachers browse the Internet for new topics before they develop their notes of lessons; guiding teachers in preparing PowerPoint slides for their lessons; encouraging teachers to make their lessons activity-based by integrating technological devices and demonstrating to teachers how digital devices can be integrated in the teaching-learning process. However, it was observed that the principals do not ensure that teachers type their lesson notes and integrate gamified learning in the classrooms.

**Research Question Two:** How can professional development programmes improve teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State?

Table 2: Mean Scores and Standard Deviations on the Opinions of Male and Female Principals on Ways Professional Development Programmes Improve Teachers' Digital Competences for Implementation of Technology-driven Classrooms in Secondary Schools in Rivers State

S/N	Ways Professional Development Programmes Improve Teachers' Digital Competences Include:	Male Principals		Female Principals		Decision
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	
9.	The Rivers State Ministry of Education organizes professional development programmes on digital pedagogical competences for principals, which I attend.	2.89	0.64	2.86	0.87	Agree
10.	I conduct internal workshops to improve teachers' digital competences in my school.	2.81	0.65	2.77	0.88	Agree
11.	I encourage teachers attend in-service training on digital pedagogical competences.	2.93	0.63	2.85	0.87	Agree
12.	I regularly invite Information Technology (IT) experts to train teachers on how to integrate modern technological devices in the teaching-learning process.	2.36	0.69	2.42	0.93	Disagree
13.	I encourage ICT teachers to assist teachers in using the available digital devices in the classrooms.	2.67	0.66	2.74	0.89	Agree
14.	The State Government subsidizes for teachers to attend conferences on digital pedagogical competences.	1.49	0.76	1.37	1.05	Disagree
15.	I usually conduct Induction programmes for new teachers on the usages of digital devices in my school.	2.78	0.65	2.72	0.89	Agree
<b>Aggregate Mean and SD</b>		<b>2.56</b>	<b>0.67</b>	<b>2.53</b>	<b>0.91</b>	<b>Agree</b>

Table 2 displays the mean responses of male and female principals on ways professional development programmes can enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State. Both male and female principals agreed on items: 9, 10, 11, 13 and 15 in the Table with mean scores greater than the criterion mean of 2.50. However, they disagreed on items: 12 and 14, which are less than the criterion mean of 2.50. Their aggregate mean scores of 2.56 and 2.53 respectively, indicate that they agreed that professional development programmes can enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State. These include: external and internal workshops, in-service trainings, seminars, conferences



and inductions. Conversely, principals hardly invite IT experts to train teachers on the usages of modern technological devices in the teaching-learning process.

Table 3: z-test on the Difference between the Mean Ratings of Male and Female Principals on Ways Supervision Enhance Teachers' Digital Competences for Implementation of Technology-driven Classrooms in Secondary Schools in Rivers State

Status	N	$\bar{X}$	SD	Df	z-cal	Critical Value	Remarks
Male Principals	125	2.52	0.67	191	0.08	$\pm 1.96$	Not Significant
Female Principals	68	2.51	0.92				

$P < 0.05$

Table 3 reveals the z-test analysis on the difference between the mean ratings of male and female principals on ways supervision enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State. The result shows that z-calculated value of 0.08 is less than the critical value of  $\pm 1.96$ ; therefore, the null hypothesis is accepted at 0.05 alpha level. Thus, there is no significant difference on the mean ratings of male and female principals on ways supervision enhance teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State.

Table 4: z-test on the Difference between the Mean Ratings of Male and Female Principals on How Professional Development Programmes Improve Teachers' Digital Competences for Implementation of Technology-driven Classrooms in Secondary Schools in Rivers State

Status	N	$\bar{X}$	SD	Df	z-cal	Critical Value	Remarks
Male Principals	125	2.56	0.67	191	0.24	$\pm 1.96$	Not Significant
Female Principals	68	2.53	0.91				

$P < 0.05$

Table 4 reveals the z-test analysis on the difference between the mean ratings of male and female principals on how professional development programmes improve teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State. The result shows that z-calculated value of 0.24 is less than the critical value of  $\pm 1.96$ ; therefore, the null hypothesis is accepted at 0.05 alpha level. Thus, there is no significant difference on the mean ratings of male and female principals on how professional development programmes improve teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State.

## DISCUSSION OF FINDINGS

This study has revealed that supervision enhances teachers' digital pedagogical competences for implementation of technology-driven classrooms in secondary schools in Rivers State. These include: conducting regular classroom visitations; ensuring that teachers browse the Internet for new topics before they develop their notes of lessons; guiding teachers in preparing PowerPoint slides for their lessons; encouraging teachers to make their lessons activity-based by integrating technological devices and demonstrating to teachers how digital devices can be integrated in the

teaching-learning process. However, it was also observed that the principals do not ensure that teachers type their lesson notes. The finding is in agreement with Kochhar (2000) as cited in Adieme and Asuku (2020), who stressed that the success or failure of a school depends on the supervisory skill, knowledge, personality and professional development of the school administrator. It is also in line with Sabola (2013), who discovered that monitoring curriculum implementation through regular supervision helps to promote good pedagogical practices, discourages unprofessional practices and provides teachers with relevant information for their professional development. Hence, the implication of this finding is that to manage teachers' digital competences effectively, the principals must be smart leaders, who are digitally competent, and ensure that the teachers are constantly guided on the usages of the new technological devices.

Another finding of this study revealed that professional development programmes improve teachers' digital competences for implementation of technology-driven classrooms in secondary schools in Rivers State. These include: external and internal workshops, in-service trainings, seminars, conferences and inductions. Conversely, it was discovered that principals hardly invite IT experts to train teachers on the usages of modern technological devices in the teaching-learning process. This finding agrees with Imo et al. (2013); Amadi and Promise (2013), who observed in their different studies that in-service training, workshops, seminars, among others on curriculum change and innovation in teaching methodologies enhance teachers' skills and service delivery in Nigerian secondary schools. It is also in consonance with Guedes and Milton (2018), discovered that professional development training programmes for teachers played a key role in enhancing students' quality learning in Mozambique. The finding also agrees with Nabunya et al. (2019), who emphasized that when teachers participate in professional development programmes, they become acquainted with new ideas, skills and knowledge that help them to be relevant in the teaching profession. Thus, the implication of this finding is that teachers' ability to deliver effectively in this digital era depends on their professional development on digital pedagogical competences.

## **CONCLUSION**

Based on the findings of this study, it is therefore concluded that supervision and professional development programmes are very critical to managing teachers' digital competences in the actualisation of technology-driven classrooms in secondary schools in Rivers State. In order to digitalize the secondary education process by equipping the students with the basic digital skills, due considerations must be given to the teachers, who are the catalysts and implementers of the curriculum.

## **Recommendations**

Based on the findings of this study, the following recommendations were made:

- Principals should ensure that they are well-equipped with the basic digital pedagogical knowledge and skills that will make them competent to supervise teachers' digital competences in technology-driven classrooms.

- Teachers should regularly undergo professional development programmes on digital pedagogical competences in order to enable them to effectively integrate modern technological devices that will make the students participate actively in the classrooms.

## REFERENCES

- Adieme, F. G., & Asuku, M. (2020). Principals' supervisory techniques and quality education in secondary schools in Rivers State: Implications for technology and economic development. *Journal of Trends in Educational Studies*, 12(2), 115-125.
- Amadi. E. C. & Promise, A. (2013). Professional development and teachers' academic performance in secondary schools in Etche Local Government Area of Rivers State. *International Journal of Education and Development*, 1(2), 19-23.
- Butler, D., Twining, P., Fisser, P., Leahy, M., Shelton, C., Forget-Dubois, N., & Lacasse, M. (2020). Developing a quality curriculum in a technological era. *Educational Technology Research and Development*, 69, 2285-2308.
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crises. *Journal of Educational Technology*, 49(1), 5-22. <https://doi.org/10.1177/0047239520934018>.
- Eze, U. N., Sefotho, M. M., Onyishi, C. N., & Eseadi, C. (2012). Impact of COVID-19 pandemic on education in Nigeria: Implications for policy and practice of e-learning. *Library Philosophy and Practice (e-journal)*, 5, 651. <https://digitalcommons.unl.edu/libphilprac/5651>.
- Falloon, G. (2020). From digital literacy to digital competence: The teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68, 2449-2472.
- Federal Ministry of Education (2015). *National policy on special needs education in Nigeria*. NERDC.
- Federal Republic of Nigeria (2014). *National policy on education (6th ed.)*. NERDC.
- Guedes, C., & Milton, A. Z. (2018). Use of digital technologies in secondary schools in the City of Nampula – Mozambique. *The European Journal of Educational Research*, 1(1), 57-75.
- Hakansson, L. M., & Pettersson, F. (2019). Digitalization and school leadership: The complexity of leading for digitalization in school. *International Journal of Information and Learning Technology*, 36(3), 218-230.
- Hinrichsen, J., & Coombs, A. (2013). The five resources of critical digital literacy: A framework for curriculum integration. *Research in Learning Technology*, 21, 1-16.
- Hu, D., Yuan, B., Luo, J., & Wang, M. (2021). A review of empirical research on ICT applications in teacher professional development and teaching practice. *Knowledge Management & E-Learning*, 13(1), 1-20. <https://doi.org/10.34105/j.kmel.2021.13.001>.
- Ilomaki, L., & Lakkala, M. (2018). Digital technology and practices for school improvement: Innovative digital school model. *Research and Practice in Technology Enhanced Learning*, 13(25), 403-420.
- Imo, E. U., Oswald, E. A., & Inyang, N. U. (2013). Staff development programmes and secondary school teachers' job performance in Oyo Metropolis, Nigeria. *Journal of Education and Practice*, 1(4), 70-85.
- Kurasha, P., & Chabaya, A. R. (2013). Curriculum development and implementation: Factors contributing towards curriculum development in Zimbabwe higher education system. *European Social Sciences Research Journal*, 1(1), 55-65.

- Nabunya, K., Mukwenda, H. T., & Kyaligonza, R. (2019). Professional development practices and service delivery of academic staff at Kampala International University and Kyambogo University. *Makerere Journal of Higher Education*, 10(2), 133-143.
- Nwideeduh, S. B., & Adieme, F. G. (2021). Application of digital surveillance as a managerial tool for quality assurance in secondary schools in Rivers State, Nigeria. *The International Journal of Business and Management*, 9(3), 9-15.
- Obanya, P. (2014). *Educationeering*. HEBN Publishers.
- Ofojebe, W. N. (2014). Imperatives of curriculum development, management and improvement in the Nigerian educational system. In G. O. Unachukwu & P. N. Okorji (Eds.), *Educational management: A skill building approach* (pp. 434-466). Rex Charles & Patrick.
- Okoro, J. (2013). Ideal quality of university business education curriculum required for successful graduates' employment as perceived by lecturers. *Journal of Education and Practice*, 4(15), 114-118.
- Pettersson, F. (2021). Understanding digitalization and educational change in school by means of activity theory and the levels of learning concept. *Education and Information Technologies*, 26, 187-204.
- Prensky, M. (2001). *Digital natives, digital immigrants*. <http://www.marcprensky.com/writing/Prensky%20%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>.
- Rajesh, S., & Lakshmi, P. (2021). An empirical study on effectiveness of digital education in schools at Hassan City during the pandemic. *International Journal of Research in Engineering and Science*, 9(2), 62-68.
- Sabola, B. C. (2017). Managing the implementation of a school curriculum in Malawi: Challenges and policy implications. *Texila International Journal of Management*, 3(2), 137-158.
- Syomwene, A. (2013). Factors affecting teachers' implementation of curriculum reforms and educational policies in schools: The Kenyan experience. *Journal of Education and Practice*, 4(22), 80-86.
- Ukala, C. C., & Adieme, F. G. (2022). Management of hidden costs of technology in post COVID-19 twenty-first century for teacher engagement in senior secondary schools in Rivers State, Nigeria. *Journal of the Nigerian Academy of Education*, 18(1), 339-356.
- United Nations Educational, Scientific and Cultural Organisation (2011). *ICT competency standards for teachers (version 2)*. UNESCO.
- Zalat, M. M., Hamed, M. S., & Bolbol, S. A. (2021). The experiences, challenges, and acceptance of e-learning as a tool for teaching during the COVID-19 pandemic among university medical staff. *PLoS ONE Journal*, 16(3). <https://doi.org/10.1371/journal.pone.0248758>