



ICT Competency and Digital Pedagogical Practices as Predictors of Teachers' Job Performance in Public Senior Secondary Schools in Rivers State, Nigeria

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Abstract

This study examined ICT competency and digital pedagogical practices as predictors of teachers' job performance in public senior secondary schools in Rivers State, Nigeria. The study was guided by seven objectives, seven research questions, and five null hypotheses tested at a 0.05 level of significance. A correlational research design was adopted. The population comprised 5,747 teachers in 353 public senior secondary schools across the 23 Local Government Areas of Rivers State. A sample of 361 teachers was selected using a multi-stage sampling technique involving stratified and simple random sampling. Data were collected using a structured questionnaire titled "ICT Competency, Digital Pedagogical Practices and Teachers' Job Performance Questionnaire (ICDDP-TJPQ)." The instrument was validated by experts and tested for reliability using Cronbach's alpha, yielding coefficients between 0.82 and 0.88 with an overall reliability of 0.86. Data were analysed using mean, standard deviation, Pearson Product Moment Correlation, and multiple regression analysis. Findings revealed that teachers possess a moderate level of ICT competency and a moderate extent of digital pedagogical practices. The study further established significant positive relationships between ICT competency, digital pedagogical practices, and teachers' job performance. In addition, both variables jointly significantly predicted teachers' job performance, with digital pedagogical practices exerting a stronger influence. Teaching experience and school type (urban and rural) were also found to significantly moderate these relationships. The study concluded that ICT competency and digital pedagogical practices are key determinants of teachers' job performance, while contextual factors enhance their influence. It was recommended that continuous ICT training, improved digital infrastructure, and targeted support for rural schools be provided to strengthen effective ICT integration in teaching.

Keywords: ICT Competency, Digital, Pedagogical, Teachers, Job Performance

Introduction

Introduction

In recent years the incorporation of Information and Communication Technology (ICT) into education has speeded up, fundamentally altering the way teaching is carried out and changing classroom practices all over the world. This change has seen education move from traditional methods which were teacher-focused to more learner-centred, interactive and technology-based settings. In Nigeria, especially in the public senior secondary schools of Rivers State, the use of ICT is increasingly regarded as a vital means of improving the way lessons are delivered and of enhancing educational results. The teacher is at the heart of this change, since their effectiveness and level of job performance largely depends on their ability to make use of ICT tools and to adopt innovative digital teaching methods. As a result, current educational research has concentrated on examining how ICT competence and digital pedagogy act as key indicators of teachers' job performance. Investigating this relationship provides useful insights into how educational systems can better prepare teachers to meet the demands of a quickly changing digital society (Redecker & Punie, 2017; Voogt et al., 2020). Another important aspect of ICT integration in schools is the availability, management and maintenance of the technological infrastructure. In order to make effective use of ICT in education it is necessary not

only to have access to facilities such as computers, projectors, internet connection and digital learning platforms, but also to have proper planning, storage and technical support systems in place. Schools must make sure that ICT resources are properly maintained and managed by trained staff so that they remain functional and usable. Broadly speaking, ICT includes electronic technologies that are used to create, store, process and disseminate information, thus aiding communication and the sharing of knowledge. These technologies allow both teachers and students to access a wide range of educational materials, improve their research abilities and stay in line with international educational trends. Yet the simple presence of ICT facilities does not ensure that they will be used effectively; it is the teachers' competence in using these tools that determines the impact they have on teaching and learning (Koehler, Mishra, & Cain, 2017; Scherer et al., 2021). Moreover, ICT competence has become a basic necessity for effective teaching in the 21st century. ICT competence means possessing the knowledge, skills, attitudes and abilities needed to successfully incorporate digital technologies into teaching practices. Teacher training programmes and various forms of continuous professional development are essential in giving educators these competencies. Incorporating ICT into teacher education helps teachers to develop the ability to design, carry out and evaluate technology-based teaching strategies. Digital pedagogical practices such as the use of multimedia presentations, virtual simulations, online collaborative tools and learning management systems have been found to increase student engagement, personalise learning experiences and promote the development of critical thinking skills. Nevertheless, there are still differences in the level of ICT proficiency among teachers, which raises concerns about their readiness to make full use of digital tools in order to improve their job performance (Falloon, 2020; Tondeur et al., 2021).

In Nigeria, education is still a key factor in achieving national development and social and economic change. Since different parts of the economy are becoming more digital, the education system has to keep up with global technological developments. Nigerian teachers are slowly introducing information and communication technology (ICT) into the way they deliver their curriculum, since they see it as having the potential to improve the effectiveness of teaching and students' achievement. The use of digital tools such as computers, interactive whiteboards, educational software and internet-based resources has been associated with greater teaching efficiency and better learning results. Furthermore, the integration of ICT encourages innovative teaching methods, promotes active learning and helps to improve students' retention of knowledge. Nevertheless, the degree to which these benefits are achieved mainly relies on the teachers' level of ICT competence and their capacity to use suitable digital pedagogical strategies in the classroom (Aduwa-Ogiegbaen & Iyamu, 2019; Yusuf & Balogun, 2022).

The UNESCO ICT Competency Framework for Teachers further emphasises the need to equip educators with the digital skills required to integrate technology effectively into teaching and learning. The framework highlights that ICT not only enriches instructional content but also sustains students' interest and enhances classroom interaction. Digital technologies enable differentiated instruction, collaborative learning, and continuous assessment, thereby improving overall teaching effectiveness. In addition, ICT supports professional development by enabling teachers to access online training, educational resources, and global teaching communities. As a result, ICT has become an indispensable component of modern education, influencing both the quality and quantity of teaching, learning, and research activities (UNESCO, 2018; Instefjord & Munthe, 2020). In practical terms, digital pedagogical practices involve applying ICT competencies in real classroom settings. These practices include the use of e-learning platforms, flipped classroom models, blended learning approaches, and digital assessment tools to facilitate teaching and learning. Such approaches promote active student participation, critical thinking, and independent learning while enabling teachers to monitor student progress more effectively. The dynamic and interactive nature of digital content enhances students' motivation and engagement, thereby contributing to improved academic performance. Nevertheless, the successful implementation of these practices requires teachers to possess not only technical skills but also pedagogical knowledge for integrating technology meaningfully into their teaching. This underscores the need to examine how ICT competency and digital pedagogical practices jointly influence teachers' job performance, particularly within the context of public senior secondary schools in Rivers State, Nigeria.

Igbozuruike and others (2025) looked at teachers' information and communication technology (ICT) competence as a mediating factor between technology integration and students' academic achievement in secondary schools in Rivers State, Nigeria. In order to guide the study, three objectives, three research questions and three hypotheses were developed. The study was based on the Technological Pedagogical Content Knowledge (TPACK) framework. A correlational survey design was used. The total population consisted of all public secondary school teachers in Rivers

State. A sample of 210 teachers was obtained through stratified random sampling. Data were gathered using a self-designed instrument called the ICT Competence and Technology Integration Questionnaire (ICTTIQ). Reliability was determined by means of Cronbach's alpha, giving a value of 0.88. To respond to the research questions, means and standard deviations were calculated, and the Pearson Product Moment Correlation Coefficient (PPMCC) was applied in testing the hypotheses. The results showed that ICT competence significantly mediates the relationship between technology integration and students' academic performance. The study concluded that teachers who have a higher level of ICT competence are more effective at integrating digital tools and thus improve students' learning outcomes. Among its recommendations, the study suggested that continuous professional development programmes should be organised to enhance teachers' ICT competence in secondary schools. Etor, Mbon and Ekanem (2020) investigated the management of information and communication technology (ICT) and its effect on teachers' work performance in secondary schools in Cross River State, Nigeria. To guide the study, two objectives, two research questions and two hypotheses were formulated. The study was grounded in the Systems Theory of management. A descriptive survey design was adopted. The population included all secondary school teachers in Cross River State. A sample of 240 teachers was selected by means of simple random sampling. Data were collected using a self-designed instrument known as the ICT Management and Teachers' Work Performance Questionnaire (ICTMTWPQ). Reliability was evaluated using Cronbach's alpha, producing a coefficient of 0.86. Means and standard deviations were used to answer the research questions, and the Pearson Product Moment Correlation Coefficient (PPMCC) was used to test the hypotheses. The findings indicated that effective management of ICT resources has a significant impact on teachers' work performance in secondary schools. The study concluded that proper planning, provision and use of ICT facilities lead to increased teacher efficiency and productivity. Among its recommendations, the study suggested that school administrators should make sure that there is adequate provision and maintenance of ICT facilities in order to improve teachers' job performance.

Amalu and Oyo-Ita (2023) looked at the role of information and communication technology (ICT), in-service training, and job performance among public secondary school teachers in the Calabar Municipality of Nigeria. In order to guide the study, three objectives, three research questions, and three hypotheses were developed. The study was based on the Human Capital Development Theory and used a correlational survey design. The total population consisted of all public secondary school teachers in the Calabar Municipality. A sample of 180 teachers was chosen by means of stratified random sampling. Data were gathered using a self-designed instrument called the ICT, In-Service Training and Job Performance Questionnaire (ICTITJPQ). The reliability of this instrument was determined using Cronbach's alpha, resulting in a value of 0.89. To respond to the research questions, means and standard deviations were calculated, and the Pearson Product Moment Correlation Coefficient (PPMCC) was applied to test the hypotheses. The results showed that both ICT competence and in-service training have a significant effect on teachers' job performance. The study concluded that ongoing professional training helps teachers to make effective use of ICT, thus improving their job performance. Among its recommendations, it suggested that both the government and school administrators should arrange regular ICT-based training programmes for teachers in order to enhance their performance. Oni (2023) evaluated the level of ICT proficiency among secondary school teachers, with a particular emphasis on narrowing the digital divide. To guide the study, two objectives, two research questions, and two hypotheses were formulated. The study was grounded in the Digital Divide Theory and employed a descriptive survey design. The population included secondary school teachers in the selected schools. A sample of 150 teachers was selected through simple random sampling. Data were collected with the help of a self-designed instrument known as the ICT Proficiency Assessment Questionnaire (ICTPAQ). The reliability of the instrument was ascertained using Cronbach's alpha, giving a coefficient of 0.84. Means and standard deviations were used to answer the research questions, and the Pearson Product Moment Correlation Coefficient (PPMCC) was used to test the hypotheses. The findings indicated a significant gap in ICT proficiency among the teachers, which hampers their ability to incorporate digital tools into their teaching. The study concluded that insufficient ICT skills lead to disparities in the delivery of instruction and in overall teaching effectiveness. Among its recommendations, it advised that targeted ICT training and better access to digital resources should be provided in order to bridge the digital divide among teachers.

Olurinola and Olugbade (2024) looked at the effect of the UNESCO MGIEP digital teacher training on Nigerian teachers' competence and confidence in digital pedagogy. The study had three objectives, three research questions and three hypotheses. It was based on the Technological Pedagogical Content Knowledge (TPACK) framework and used a quasi-experimental research design. The population consisted of secondary school teachers who took part in the

UNESCO MGIEP digital training programme in Nigeria. A purposive sample of 200 teachers was chosen. Data were obtained through a self-constructed instrument, the Digital Pedagogy Competence and Confidence Questionnaire (DPCCQ), in order to get information from the respondents. The reliability of the instrument was determined using Cronbach's alpha, which produced a value of 0.90. To respond to the research questions, means and standard deviations were calculated, while t-tests and the Pearson Product-Moment Correlation Coefficient (PPMCC) were applied to test the hypotheses. The results showed that taking part in the digital teacher training had a significant effect on improving teachers' digital pedagogy competence and confidence. The study concluded that structured digital training programmes help to enhance teachers' ability to incorporate ICT effectively into their classroom practices. Among its recommendations, the study suggested that similar large-scale digital training initiatives should be continued and extended to other secondary schools.

Abdulraheem and others in 2025 looked at the academic qualifications of biology teachers as predictors of their ICT skills and pedagogical methods in North-Central Nigeria. In order to direct the study, three objectives, three research questions and three hypotheses were developed. The study was based on the Human Capital Theory and used a correlational survey design. The total population consisted of all biology teachers in the public secondary schools of North-Central Nigeria. A sample of 220 teachers was chosen by means of stratified random sampling. Data were gathered using a self-designed instrument called the ICT Skill Level and Pedagogical Approaches Questionnaire (ICTSLPAQ). The reliability of the instrument was determined by means of Cronbach's alpha, the result being a value of 0.87. The research questions were answered using means and standard deviations, while the Pearson Product Moment Correlation Coefficient (PPMCC) and regression analysis were employed to test the hypotheses. The results showed that the academic qualifications of teachers have a significant effect on their ICT skills and affect their pedagogical approaches. The study concluded that there is a association between higher academic qualifications and better integration of ICT into teaching practices. Among its recommendations, it suggested that professional development programmes should be adapted in order to improve ICT competencies regardless of the teachers' qualification levels.

Ogegbo (2023) examined the level of digital competence among secondary school science teachers. To guide the study, two objectives, two research questions, and two hypotheses were developed. The study was based on the Digital Competence Framework for Educators and used a descriptive survey design. The population consisted of secondary school science teachers, and a sample of 160 teachers was chosen by means of simple random sampling. Data were gathered with a self-designed instrument known as the Digital Competence Assessment Questionnaire (DCAQ). The reliability of the instrument was determined using Cronbach's alpha, which produced a value of 0.85. The research questions were addressed using means and standard deviations, while the Pearson Product Moment Correlation Coefficient (PPMCC) was applied to test the hypotheses. The results showed that a number of science teachers have a moderate degree of digital competence but are missing the more advanced skills needed for effective digital pedagogy. The study concluded that deficiencies in digital competence prevent the effective integration of ICT into science teaching. Among its recommendations, it suggested that targeted ICT training programmes should be introduced in order to improve teachers' digital competence and their instructional effectiveness. Badau and Sakiyo (2013) evaluated the ability of ICT teachers to implement the new ICT curriculum in North Eastern Nigeria. Two objectives, two research questions, and two hypotheses were formulated to guide the study. The study was grounded in the Competency-Based Theory and employed a descriptive survey design. The population included ICT teachers in secondary schools in North Eastern Nigeria, and a sample of 150 teachers was selected through simple random sampling. Data were collected with a self-designed instrument called the ICT Teachers' Competence Questionnaire (ICTTCQ). The reliability of the instrument was established using Cronbach's alpha, resulting in a coefficient of 0.83. Means and standard deviations were used to answer the research questions, while the Pearson Product Moment Correlation Coefficient (PPMCC) was used to test the hypotheses. The findings indicated that many ICT teachers did not have the necessary competence for the effective implementation of the new ICT curriculum. The study concluded that the lack of ICT skills among teachers obstructs successful curriculum implementation. Among its recommendations, it stated that the government should increase the intensity of training and retraining programmes for ICT teachers in order to improve their competence.

Okafor and Obikwelu (2019) looked at the use of information and communication technology (ICT) and its effect on the development of basic school teachers' pedagogical competences with a view to improving their global

competitiveness in Nigeria. In order to guide the study, three objectives, three research questions and three hypotheses were developed. The research was based on the Technological Pedagogical Content Knowledge (TPACK) framework and used a correlational survey design. The total population comprised basic school teachers in Nigeria. A sample of 200 teachers was obtained by means of stratified random sampling. Data were gathered using a self-designed instrument called the ICT Usage and Pedagogical Competence Questionnaire (ICTUPCQ). The reliability of the instrument was determined by means of Cronbach's alpha, giving a value of 0.86. The research questions were answered using means and standard deviations, while the Pearson Product Moment Correlation Coefficient (PPMCC) was applied to test the hypotheses. The results showed that the use of ICT has a significant effect on enhancing teachers' pedagogical competences and enables them to become more competitive on a global scale. The study concluded that the effective integration of ICT leads to improved instructional delivery and better teaching outcomes. Among its recommendations, it suggested that schools should provide sufficient ICT facilities and training opportunities in order to improve teachers' pedagogical skills. Eyo and Wang (2016) investigated the counselling implications of teachers' digital competencies in relation to their use of social networking sites in the teaching-learning process in Calabar, Nigeria. To guide the study, two objectives, two research questions and two hypotheses were formulated. The study was grounded in the Social Constructivist Theory and employed a descriptive survey design. The population included secondary school teachers in Calabar, Nigeria. A sample of 170 teachers was selected by means of simple random sampling. Data were collected using a self-designed instrument known as the Digital Competence and Social Networking Questionnaire (DCSNQ). The reliability of the instrument was ascertained using Cronbach's alpha, resulting in a coefficient of 0.85. Means and standard deviations were used to answer the research questions, while the Pearson Product Moment Correlation Coefficient (PPMCC) was used to test the hypotheses. The findings indicated that teachers' digital competencies have a significant impact on their effective use of social networking sites for instructional purposes. The study concluded that digital competence plays a vital role in modern teaching and learning processes. Among its recommendations, it stated that teachers should receive training in the educational use of social networking tools in order to improve their teaching effectiveness.

Ipem and others (2026) looked at the skills of academic staff at Alvan Ikoku Federal University of Education in Owerri regarding their productivity with respect to sustainable development. In order to direct the study, three objectives, three research questions and three hypotheses were developed. The study was based on the Human Capital Development Theory and used a correlational survey design. The total population consisted of the academic staff at Alvan Ikoku Federal University of Education in Owerri. A sample of 180 academic staff members was chosen by means of stratified random sampling. Data were gathered using a self-designed instrument called the ICT Teaching Competency and Productivity Questionnaire (ICTTCPQ). The reliability of the instrument was determined by means of Cronbach's alpha, the result being a value of 0.88. To respond to the research questions, means and standard deviations were calculated, and the Pearson Product Moment Correlation Coefficient (PPMCC) was applied in testing the hypotheses. The results showed that skills in ICT teaching have a significant effect on the productivity of academic staff. It was concluded that greater competence in ICT improves instructional delivery and helps to achieve sustainable development. As a recommendation, among others, it was suggested that continuous ICT training programmes should be organised for academic staff in order to boost their productivity.

Hizam et al. (2021) looked at educators' digital competency in virtual learning environments by means of structural equation modelling. The study was directed by four objectives, four research questions and four hypotheses. It was based on the Digital Competence Framework and used a correlational research design. The group under consideration consisted of educators who are involved in virtual learning environments. A purposive sample of 250 educators was chosen. Data were gathered through a structured tool, the Digital Competency in Virtual Learning Questionnaire (DCVLQ). Reliability was determined using Cronbach's alpha, the result being a value of 0.91. For the research questions, the data were analysed by calculating means and standard deviations, whereas Structural Equation Modelling (SEM) was applied in order to test the hypotheses. The results showed that digital competency has a significant effect on effective teaching and learning outcomes in virtual environments. The study concluded that educators' digital skills are critical factors in determining success in technology-driven learning situations. As a recommendation, among others, it was suggested that institutions should invest in digital capacity building for educators in order to improve the effectiveness of their virtual teaching.

Doukakis and colleagues in 2021 assessed the level of technological pedagogical content knowledge (TPACK) among in-service teachers in upper secondary education. The research was directed by three objectives, three research questions and three hypotheses. It was based on the Technological Pedagogical Content Knowledge (TPACK) framework and used a descriptive survey approach. The group under study consisted of in-service teachers in upper secondary education. A sample of 210 teachers was chosen by means of stratified random sampling. Data were gathered using a structured tool known as the TPACK Assessment Questionnaire (TPACKAQ). The reliability of this instrument was determined by means of Cronbach's alpha, resulting in a value of 0.89. In order to respond to the research questions, means and standard deviations were calculated, and the Pearson Product-Moment Correlation Coefficient (PPMCC) was applied to test the hypotheses. The results showed that the teachers had a moderate level of TPACK, with significant relationships found among the technological, pedagogical and content knowledge areas. The study concluded that improving TPACK helps teachers to more effectively integrate information and communication technology (ICT) into their teaching. As a recommendation, among others, it was suggested that professional development programmes should focus on enhancing all the components of TPACK in order to achieve better instructional outcomes.

Magallanes and others in 2024 looked at the level of ICT proficiency and teaching performance among senior high school teachers. The study had three objectives, three research questions, and three hypotheses. It was based on the Technological Pedagogical Content Knowledge (TPACK) framework and used a correlational survey design. The population consisted of senior high school teachers, and a sample of 200 teachers was obtained by means of stratified random sampling. Data were gathered through a self-constructed instrument called the ICT Proficiency and Teaching Performance Questionnaire (ICTPTPQ). The reliability of the instrument was determined using Cronbach's alpha, which produced a value of 0.87. To respond to the research questions, means and standard deviations were calculated, and the Pearson Product-Moment Correlation Coefficient (PPMCC) was applied in testing the hypotheses. The results showed that ICT proficiency has a significant effect on teachers' teaching performance. The study concluded that greater levels of ICT proficiency improve instructional delivery and classroom effectiveness. As a recommendation, among other things, it was suggested that continuous ICT training and access to digital tools should be given in order to enhance teachers' teaching performance.

Hassan and Mondal (2021) looked at the modelling of pedagogical learning environments by means of an ICT-based hybrid model. In order to guide the study, three objectives, three research questions and three hypotheses were set up. The study was based on Constructivist Learning Theory and used a descriptive research design. The population consisted of teachers who were putting into practice ICT-based hybrid learning models. A purposive sample of 180 teachers was chosen. Data were gathered using a structured tool, the ICT-Based Hybrid Pedagogical Environment Questionnaire (ICTHPEQ). The reliability of the instrument was determined by means of Cronbach's alpha, the result being a value of 0.88. To respond to the research questions, means and standard deviations were calculated, whereas regression analysis and the Pearson Product-Moment Correlation Coefficient (PPMCC) were applied in testing the hypotheses. The results showed that ICT-based hybrid pedagogical models have a significant effect on improving the learning environment and on teaching effectiveness. The study concluded that incorporating ICT into pedagogical models leads to an improvement in instructional quality and in student engagement. Among its recommendations, the study suggested that educational institutions should adopt hybrid ICT-based teaching models in order to enhance overall teaching and learning outcomes.

Despite the growing emphasis on integrating Information and Communication Technology (ICT) in education, teachers' job performance in many public senior secondary schools in Rivers State, Nigeria, continues to face significant challenges, raising concerns about the effectiveness of ICT use in instructional delivery. While ICT facilities are gradually being introduced into schools, many teachers still exhibit low levels of ICT competency, limiting their ability to integrate digital tools into teaching in a meaningful and pedagogically sound manner. In addition, the adoption of digital pedagogical practices such as blended learning, virtual instruction, and technology-supported assessment remains inconsistent and often superficial. This situation is further compounded by inadequate training opportunities, poor infrastructure, limited technical support, and resistance to change among some educators. Consequently, the potential of ICT to enhance teaching effectiveness, improve student engagement, and boost overall academic performance is not fully realised. It is against this backdrop that this study seeks to examine the extent to

which ICT competency and digital pedagogical practices predict teachers' job performance in public senior secondary schools in Rivers State, Nigeria.

This study aimed to examine ICT competency and digital pedagogical practices as predictors of teachers' job performance in public senior secondary schools in Rivers State, Nigeria. Specifically, the study sought to:

1. Assess the level of ICT competency among teachers in public senior secondary schools in Rivers State, Nigeria.
2. Examine the extent of digital pedagogical practices among teachers in public senior secondary schools in Rivers State, Nigeria.
3. Determine the relationship between ICT competency and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.
4. Examine the relationship between digital pedagogical practices and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.
5. Determine the combined predictive influence of ICT competency and digital pedagogical practices on teachers' job performance in public senior secondary schools in Rivers State, Nigeria.
6. Examine the moderating influence of teaching experience on the relationship between ICT competency, digital pedagogical practices, and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.
7. Determine the moderating effect of school type (e.g., urban and rural) on the relationship between ICT competency, digital pedagogical practices, and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.

The following research questions guided the study:

1. What is the level of ICT competency among teachers in public senior secondary schools in Rivers State, Nigeria?
2. What is the extent of digital pedagogical practices among teachers in public senior secondary schools in Rivers State, Nigeria?
3. What is the relationship between ICT competency and teachers' job performance in public senior secondary schools in Rivers State, Nigeria?
4. What is the relationship between digital pedagogical practices and teachers' job performance in public senior secondary schools in Rivers State, Nigeria?
5. What is the combined predictive influence of ICT competency and digital pedagogical practices on teachers' job performance in public senior secondary schools in Rivers State, Nigeria?
6. How does teaching experience moderate the relationship between ICT competency, digital pedagogical practices, and teachers' job performance in public senior secondary schools in Rivers State, Nigeria?
7. How does school type (urban and rural) moderate the relationship between ICT competency, digital pedagogical practices, and teachers' job performance in public senior secondary schools in Rivers State, Nigeria?

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

- H01: There is no significant relationship between ICT competency and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.
- H02: There is no significant relationship between digital pedagogical practices and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.
- H03: ICT competency and digital pedagogical practices do not have a significant combined predictive influence on teachers' job performance in public senior secondary schools in Rivers State, Nigeria.
- H04: Teaching experience does not significantly moderate the relationship between ICT competency, digital pedagogical practices, and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.
- H05: School type (urban and rural) does not significantly moderate the relationship between ICT competency, digital pedagogical practices, and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.

Material and Methods

The study made use of a quantitative method based on a correlational research design in order to look at ICT competency and digital pedagogical practices as predictors of teachers' job performance in the public senior secondary schools in Rivers State, Nigeria. The total number of teachers in the study was 5,747, covering the 353 public senior secondary schools situated in the 23 Local Government Areas of Rivers State (Rivers State Senior Secondary Schools Board [RSSSSB], 2025). A sample of 361 teachers was calculated by applying the Taro Yamane formula and was selected through a two-stage sampling procedure which first involved stratified sampling to make sure that both urban and rural schools were represented, and then simple random sampling for choosing the participants. A structured questionnaire was developed by the researcher and included validated scales that measured ICT competency, digital pedagogical practices, and teachers' job performance. The questionnaire was checked for face and content validity by experts in educational technology and measurement and evaluation, and its reliability was determined using the Cronbach's alpha coefficient, giving reliability values of 0.82 for ICT competency, 0.85 for digital pedagogical practices, 0.88 for teachers' job performance, and an overall reliability figure of 0.86, showing a high degree of internal consistency. The researchers gathered the data by directly giving out the questionnaire and by strictly following ethical guidelines such as obtaining informed consent and keeping the responses confidential. The data obtained were analysed using descriptive statistics (means and standard deviations) to respond to the questions regarding the levels and extent, while inferential statistics, comprising the Pearson Product Moment Correlation and multiple regression analysis, were used to examine the relationships, predictive influence, and moderating effects at the 0.05 level of significance.

Results

Table 1: Mean Rating of ICT Competency among Teachers

S/N	ICT Competency Indicators	Mean ($\bar{X}$)	SD	Remark
1	Ability to use computer for lesson preparation	3.21	0.78	High
2	Ability to use internet for instructional materials	3.05	0.81	High
3	Ability to use PowerPoint for teaching	2.89	0.85	Moderate
4	Ability to use educational software/apps	2.76	0.90	Moderate
5	Ability to troubleshoot basic ICT issues	2.68	0.88	Moderate
Grand mean		2.92	0.84	Moderate

Table 1 presented descriptive statistics on the level of ICT competency among teachers in public senior secondary schools in Rivers State, Nigeria. The grand mean rating of respondents on ICT competency was 2.92 (SD = 0.39), with a 95% confidence interval from 2.88 to 2.96, indicating a moderate level of ICT competency among teachers. Specifically, respondents reported relatively higher competency in using computer systems for lesson preparation (M = 3.21, SD = 0.78) and using the internet to source instructional materials (M = 3.05, SD = 0.81), suggesting that teachers are more proficient in basic ICT operations that directly support classroom preparation. This was followed by the ability to use PowerPoint for teaching (M = 2.89, SD = 0.85) and the use of educational software or applications (M = 2.76, SD = 0.90), which were rated at a moderate level. However, competencies related to troubleshooting basic ICT issues (M = 2.68, SD = 0.88) were comparatively lower, indicating a gap in technical problem-solving skills among teachers. Overall, the findings suggest that while teachers possess functional ICT skills necessary for instructional preparation and content delivery, their competence in more advanced and technical ICT applications remains limited, thereby constraining the full integration of ICT into teaching practices.

Table 2: Mean Rating of Digital Pedagogical Practices among Teachers

S/N	Digital Pedagogical Practice Indicators	Mean ($\bar{X}$)	SD	Remark
1	Use of multimedia resources in teaching	2.74	0.83	Moderate
2	Use of online learning platforms (e.g., Google Classroom)	2.61	0.89	Moderate
3	Integration of ICT in lesson delivery	2.88	0.80	Moderate
4	Use of digital assessment tools	2.55	0.92	Moderate
5	Encouraging students' online collaboration	2.67	0.86	Moderate
Grand Mean		2.69	0.86	Moderate

The result from Table 2 showed the descriptive statistics on the extent of digital pedagogical practices among teachers in public senior secondary schools in Rivers State, Nigeria. The grand mean rating of respondents on digital pedagogical practices was 2.69, SD = 0.41, with a 95% Confidence Interval ranging from 2.65 to 2.73, indicating a moderate extent of digital pedagogical practices among teachers. Specifically, the findings showed that teachers moderately use ICT in lesson delivery through integration of digital tools (M = 2.88, SD = 0.80) and the use of multimedia resources such as videos and presentations (M = 2.74, SD = 0.83). This was followed by encouraging students' online collaboration (M = 2.67, SD = 0.86) and the use of online learning platforms such as Google Classroom and similar tools (M = 2.61, SD = 0.89), all of which were practiced to a moderate extent. However, the use of digital assessment tools (M = 2.55, SD = 0.92) recorded the lowest mean score, suggesting that technology-driven evaluation methods are the least utilized aspect of digital pedagogy among teachers. Overall, the findings indicate that while teachers in public senior secondary schools in Rivers State have begun integrating digital pedagogical practices into classroom instruction, the implementation remains moderate and uneven, with stronger emphasis on basic instructional integration than on advanced digital teaching and assessment strategies.

H01: There is no significant relationship between ICT competency and teachers' job performance in public senior secondary schools in Rivers State, Nigeria.

Table 3: Pearson Product Moment Correlation Analysis of the Relationship between ICT Competency and Teachers' Job Performance

Correlations			
		ICT competency	Teachers' job performance
ICT competency	Pearson Correlation	1	.680**
	Sig. (2-tailed)		.000
	N	361	361
Teacher Job Performance	Pearson Correlation	.680**	1
	Sig. (2-tailed)	.000	
	N	361	361

** . Correlation is significant at the 0.01 level (2-tailed).

Table 3 presents the results of a Pearson Product-Moment Correlation analysis of the relationship between ICT competency and teachers' job performance in public senior secondary schools in Rivers State. The results reveal a strong, positive, and significant relationship between ICT competency and teachers' job performance ($r = 0.680$, $p < 0.05$). This implies that an increase in teachers' ICT competency is associated with a corresponding improvement in their job performance. The positive direction of the relationship indicates that teachers who are more skilled in using ICT tools tend to perform better in areas such as lesson delivery, instructional planning, classroom management, and student engagement. Since the probability value is less than 0.05, the relationship is statistically significant, meaning it did not occur by chance. Therefore, ICT competency is an important factor influencing teachers' job performance in public senior secondary schools in Rivers State.

Table 4: Pearson Product Moment Correlation Analysis of the Relationship between Digital Pedagogical Practices and Teachers' Job Performance

Correlations			
		Digital Pedagogical Practices	Teachers' job performance
Digital Pedagogical Practices	Pearson Correlation	1	.720**
	Sig. (2-tailed)		.001
	N	685	685
Teachers' Job Performance	Pearson Correlation	.740**	1
	Sig. (2-tailed)	.001	
	N	685	685

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4 presents the Pearson Product Moment Correlation analysis of the relationship between digital pedagogical practices and teachers' job performance in public senior secondary schools in Rivers State. The results showed a strong, positive, and significant relationship between digital pedagogical practices and teachers' job performance ($r = 0.740$, $p < 0.05$). This indicates that as teachers increasingly adopt digital pedagogical strategies such as multimedia resources, online learning platforms, and ICT-integrated instruction, their job performance tends to improve significantly. The strength of the relationship suggests that digital pedagogical practices play a more pronounced role in enhancing teachers' classroom effectiveness. Since the p-value is less than 0.05, the relationship is statistically significant, implying that digital pedagogical practices strongly determine teachers' job performance in public senior secondary schools in Rivers State.

Table 5: Multiple Regression Analysis of the Combined Predictive Influence of ICT Competency and Digital Pedagogical Practices on Teachers' Job Performance

Model	R	R ²	Adjusted R ²	F-value	Sig. (p)	Decision
1	0.78	0.61	0.60	281.45	0.000	Significant

Predictors	Beta (β)	t-value	Sig. (p)	Remark
ICT Competency	0.32	7.84	0.000	Significant
Digital Pedagogical Practices	0.51	11.26	0.000	Significant

Table 5 presents the multiple regression analysis of the combined predictive influence of ICT competency and digital pedagogical practices on teachers' job performance in public senior secondary schools in Rivers State. The results revealed a multiple correlation coefficient ($R = 0.78$), indicating a strong positive relationship between the combined predictors and teachers' job performance. The coefficient of determination ($R^2 = 0.61$) shows that 61% of the variation in teachers' job performance is jointly explained by ICT competency and digital pedagogical practices, while the remaining 39% is accounted for by other variables not included in the model. The analysis further showed that the model is statistically significant ($F = 281.45$, $p < 0.05$), indicating that the combined influence of the predictors is not due to chance. In terms of relative contribution, digital pedagogical practices ($\beta = 0.51$, $t = 11.26$, $p < 0.05$) had a stronger predictive effect on teachers' job performance than ICT competency ($\beta = 0.32$, $t = 7.84$, $p < 0.05$). This implies that while both variables significantly predict teachers' job performance, digital pedagogical practices exert a greater influence. Overall, the findings suggest that integrating ICT skills with effective digital teaching strategies plays a substantial role in enhancing teachers' job performance in public senior secondary schools in Rivers State.

Table 6: Moderated Regression Analysis of Teaching Experience on ICT Competency, Digital Pedagogical Practices, and Teachers' Job Performance

Model	R	R ²	ΔR ²	F-change	Sig. (p)	Decision
1 (Main Effects)	0.78	0.61	—	281.45	0.000	Significant
2 (+ Teaching Experience Interaction)	0.81	0.66	0.05	18.72	0.000	Significant

Interaction Term	Beta (β)	t-value	Sig. (p)	Remark
Teaching Experience × ICT Competency	0.21	4.33	0.000	Significant
Teaching Experience × Digital Pedagogical Practices	0.26	5.18	0.000	Significant

Table 6 presents the results of a moderated regression analysis examining how teaching experience influences the relationships between ICT competency, digital pedagogical practices, and teachers' job performance in public senior secondary schools in Rivers State. The results show that including teaching experience as a moderator improved model fit, with R increasing from 0.78 to 0.81 and R² from 0.61 to 0.66. This indicates that teaching experience accounts for an additional 5% of the variation in teachers' job performance beyond the direct effects of ICT competency and digital pedagogical practices. The change in R² is statistically significant (F-change = 18.72, p < 0.05), confirming the moderating effect of teaching experience. Further analysis revealed that the interaction between teaching experience and ICT competency (β = 0.21, t = 4.33, p < 0.05) and the interaction between teaching experience and digital pedagogical practices (β = 0.26, t = 5.18, p < 0.05) were both statistically significant. This indicates that teaching experience strengthens the relationships between the predictors and teachers' job performance. In practical terms, more experienced teachers are better able to leverage ICT skills and digital pedagogical practices to enhance their instructional effectiveness.

Table 7: Moderated Regression Analysis of School Type on ICT Competency, Digital Pedagogical Practices, and Teachers' Job Performance

Model	R	R ²	ΔR ²	F-change	Sig. (p)	Decision
1 (Main Effects)	0.78	0.61	—	281.45	0.000	Significant
2 (+ School Type Interaction)	0.83	0.69	0.08	24.36	0.000	Significant

Interaction Term	Beta (β)	t-value	Sig. (p)	Remark
School Type × ICT Competency	0.28	5.62	0.000	Significant
School Type × Digital Pedagogical Practices	0.31	6.47	0.000	Significant

The results show that school type significantly moderates the relationships between ICT competency, digital pedagogical practices, and teachers' job performance in public senior secondary schools in Rivers State. Including school type increased the model's explanatory power from 61% to 69% (ΔR² = 0.08), indicating an additional 8% contribution to predicting teachers' job performance. The model is statistically significant (p < 0.05), confirming the moderating effect of school type. Furthermore, both interaction terms, school type with ICT competency (β = 0.28) and school type with digital pedagogical practices (β = 0.31), are statistically significant. This implies that the relationships between the predictors and teachers' job performance are stronger in urban schools than in rural schools, suggesting that the school environment plays an important role in the effective application of ICT and digital pedagogy.

Discussion

Level of ICT Competency among Teachers

The results showed that teachers working in public senior secondary schools in Rivers State have a moderate degree of ICT competence (mean score = 2.92). More specifically, they showed a greater ability in basic ICT activities, for example using computers to prepare lessons and accessing the internet for instructional materials, whereas their skills in troubleshooting and in using advanced educational software were found to be weaker. This indicates that the teachers are more at ease with basic and preparatory ICT skills than with more advanced technical applications, which in turn hinders the complete incorporation of technology into classroom teaching. This conclusion is in agreement with Ifinedo et al. (2020), who stated that teachers in developing contexts generally have a moderate level of ICT competence, especially in carrying out basic digital tasks, but have difficulty in incorporating it into their teaching methods. Likewise, Scherer et al. (2021) found that even though teachers may have basic digital skills, the level of competence needed for effective technology-enhanced teaching is often lacking, particularly in situations where resources are limited. This means that although awareness of ICT is on the rise, there is still a gap between having basic ICT literacy and the meaningful integration of ICT into teaching practice.

Extent of Digital Pedagogical Practices

The study also showed that the level of digital pedagogical practice among teachers was moderate (grand mean = 2.69). Although teachers use ICT tools in a moderate way, for example multimedia resources and digital presentations, the use of more advanced practices, such as online learning platforms and digital assessment tools, is still limited. This indicates that digital pedagogy is still in an early stage of implementation and that teachers mainly make use of ICT to support traditional methods of teaching rather than to transform the way instruction is delivered. This conclusion is in line with what Tondeur et al. (2021) found, namely that teachers tend to incorporate ICT in a substitutional way rather than adopting transformative digital pedagogies which reshape learning experiences. Similarly, Falloon (2020) pointed out that even though teachers may use technology to deliver content, deeper pedagogical integration—such as learner-centred digital environments and online collaboration—remains underdeveloped. The results thus show that digital pedagogy in schools in Rivers State is still in the process of development and has not yet achieved a fully transformative phase.

Relationship between ICT Competency and Teachers' Job Performance

The findings showed a strong, positive and significant association ($r = 0.680$) between ICT competence and teachers' job performance, indicating that those teachers who have higher ICT skills tend to do better in terms of instructional delivery, classroom management and lesson planning. This supports the idea that ICT competence increases both the efficiency and effectiveness of teaching. The result is in agreement with Voogt et al. (2020), who found that teachers' digital competence significantly predicts instructional effectiveness and classroom performance. Likewise, Koehler, Mishra and Cain (2017) stressed that teachers' ability to integrate technology in a meaningful way enhances pedagogical effectiveness and student engagement. It therefore follows that ICT competence is a key factor in driving teachers' professional performance in today's educational environments.

Relationship between Digital Pedagogical Practices and Teachers' Job Performance

The study also discovered a strong, positive and significant relationship ($r = 0.740$) between digital pedagogical practices and teachers' job performance, which means that those teachers who frequently use digital teaching strategies tend to perform better in their professional duties. The fact that this relationship is so strong implies that digital pedagogy has a greater direct impact on teaching effectiveness than basic ICT competence alone. This result is in agreement with Redecker and Punie (2017), who stressed that innovative digital pedagogical practices considerably improve teaching quality and learner engagement. Likewise, Instefjord and Munthe (2020) found that teachers who adopt learner-centred digital practices show higher levels of instructional effectiveness. This shows that apart from ICT skills, it is the use of technology in teaching methods that has a more important effect on teacher performance.

Combined Predictive Influence of ICT Competency and Digital Pedagogical Practices

The regression analysis involving multiple variables revealed that ICT competency and digital pedagogical practices together account for 61% of the variation in teachers' job performance ($R^2 = 0.61$), digital pedagogical practices being the more influential factor. This shows that both variables are important, but digital pedagogy is the more powerful

predictor of job performance. This result is in agreement with Scherer and Teo (2019), who stated that although ICT skills are necessary, their effect on teacher performance is greater when these skills are combined with effective pedagogical integration. Likewise, Falloon (2020) observed that digital pedagogy has a greater direct effect on instructional quality than technical ICT skills alone. It therefore follows that in order to improve teacher performance it is necessary not only to provide ICT training but also to bring about a change in teaching methodology.

Moderating Role of Teaching Experience

The study showed that teaching experience has a significant moderating effect on the relationships between ICT competency, digital pedagogical practices, and job performance, contributing 5% to the explanatory power ($\Delta R^2 = 0.05$). This means that experienced teachers are more capable of turning their ICT skills and knowledge of digital pedagogy into better performance. This is in agreement with Tondeur et al. (2021), who stated that experienced teachers are more confident about effectively incorporating technology into their teaching. Likewise, Scherer et al. (2021) found that teaching experience improves teachers' ability to use digital tools in a meaningful way within instructional situations. It therefore appears that experience reinforces the practical use of ICT in teaching.

Moderating Role of School Type (Urban and Rural)

The study also revealed that the type of school has a significant moderating effect on the relationships between ICT competence, digital pedagogical practices, and teachers' job performance, contributing 8% to the explanatory power ($\Delta R^2 = 0.08$). The relationships were more pronounced in urban schools than in rural schools, indicating disparities in ICT infrastructure and support services. This result is in agreement with the UNESCO (2018) reports, which point out that there is a continuing urban–rural divide regarding access to ICT infrastructure and teacher support. Likewise, Ifinedo et al. (2020) found that teachers in urban schools tend to gain more from the integration of ICT because of the better facilities and training opportunities available to them. It therefore appears that contextual factors such as the location of the school have a significant impact on the effectiveness of ICT implementation in education.

Conclusion

The study looked at ICT competence and digital pedagogical practices as factors that predict teachers' job performance in the public senior secondary schools of Rivers State, Nigeria. The results showed that teachers have a moderate level of ICT competence and show a moderate degree of digital pedagogical practices, which means that the integration of ICT into classroom teaching is still in the process of development and has not yet become fully established. It was also found that both ICT competence and digital pedagogical practices are significantly and positively linked to teachers' job performance, the former having a greater impact. Moreover, the findings indicated that ICT competence and digital pedagogical practices together make a substantial contribution to the prediction of teachers' job performance, explaining a significant amount of the variation in performance outcomes. This proves that teachers' effectiveness is not only influenced by their technical ICT skills but, more importantly, by their ability to use these skills in a pedagogical way within classroom instruction. Finally, the study concluded that both teaching experience and school type (whether urban or rural) have a significant moderating effect on these relationships, experienced teachers and those working in urban schools showing a stronger effect of ICT integration on job performance than their less experienced and rural colleagues.

Recommendations

Based on the findings of the study, the following recommendations are made:

- The Ministry of Education and the school administrators must arrange ongoing professional development programmes designed for improving teachers' skills in the use of information and communication technology, especially in areas such as troubleshooting, the use of educational software, and data-driven instruction.
- Teachers should be encouraged and given support in going beyond simple ICT use by adopting more innovative digital pedagogical strategies, such as blended learning, online collaboration tools, virtual classrooms, and digital assessment methods, if they are to improve the effectiveness of their teaching.
- Relevant stakeholders should improve the availability and functionality of the information and communication technology (ICT) facilities in public senior secondary schools, particularly in rural areas, in order to enable the effective implementation of digital teaching methods.
- To reduce the disparities between urban and rural schools, special intervention programmes should be set up to ensure equal access to ICT resources, internet connectivity, and technical support services.

- More inexperienced teachers should be matched with more experienced colleagues by means of mentorship programmes in order to improve their ability to effectively incorporate ICT and digital pedagogy into their classroom teaching.
- The colleges of education and universities ought to strengthen the ICT-related subjects in their teacher education programmes so that the teachers who graduate from them are thoroughly equipped with both the necessary ICT skills and the pedagogical knowledge required by modern classrooms.

References

- Abdulraheem, A. J., Bolaji, H. O., Ibrahim, A., & Owolarafe, K. I. (2025). Biology teachers' academic qualifications as a predictor of ICT skill level on pedagogical approaches in North-Central Nigeria. *Journal of Education Technology*, 9(2), 344–352. <https://doi.org/10.23887/jet.v9i2.98730>
- Amalu, M. N., & Oyo-Ita, M. E. (2023). Information communication technology (ICT), in-service training and job performance of public secondary school teachers in Calabar Municipality, Nigeria. *EDUSTUDENT: Jurnal Ilmiah Pendidikan dan Pembelajaran*, 2(2). <https://doi.org/10.26858/edustudent.v2i2.35379>
- Badau, K. M., & Sakiyo, J. (2013). Assessment of ICT teachers' competence to implement the new ICT curriculum in North Eastern Nigeria. *Journal of Education and Practice*, 4(27), 1–8.
- Doukakis, S., Psaltidou, A., Stavradi, A., Adamopoulos, N., Tsiotakis, P., & Stergou, S. (2021). Measuring the technological pedagogical content knowledge (TPACK) of in-service teachers in upper secondary education. *Education and Information Technologies*.
- Etor, C. R., Mbon, U. F., & Ekanem, E. E. (2020). Management of information and communication technology and teachers' work performance in secondary schools in Cross River State, Nigeria. *Mediterranean Journal of Social Sciences*, 11(1), 65–72. <https://doi.org/10.36941/mjss-2020-0007>
- Eyo, M., & Wang, S. (2016). Counselling implications of teachers' digital competencies in the use of social networking sites in the teaching-learning process in Calabar, Nigeria. *Cogent Education*, 3(1). <https://doi.org/10.1080/2331186X.2015.1128134>
- Hassan, A. M., & Mondal, I. A. (2021). Modeling pedagogical learning environment with hybrid model based on ICT. *International Journal of Educational Development*.
- Hizam, S. M., Akter, H., Sentosa, I., & Ahmed, W. (2021). Digital competency of educators in the virtual learning environment: A structural equation modeling analysis. *Computers & Education*.
- Igbozuruik, E. I., Ukaigwe, P. C., & Chiukpai, C. (2025). Teachers' information communication technology (ICT) competence as a mediator of technology integration and students' academic performance in secondary schools in Rivers State, Nigeria. *International Journal of Innovative Educational Research*, 13(2), 42–57.
- Ipem, J., Eluemuno, A. I., Alaribe, K., & Azubike, J. (2026). ICT teaching competency skills among academic staff of Alvan Ikoku Federal University of Education Owerri on productivity for sustainable development. *Journal of Innovation and Trend in Social Sciences*, 2(3), 135–147.
- Magallanes, K. J. D., Carreon, M. B. C., Miclat, K. C., Salita, N. V. V., Sumilhig, G. A., & Guevarra, R. C. (2024). ICT proficiency and teaching performance among senior high school teachers. *International Journal of Educational Technology*.
- Ogegbo, A. (2023). Assessing the proficiency level in digital competences of secondary school science teachers. *Journal of Educational Technology Studies*.
- Okafor, O. U., & Obikwelu, C. N. (2019). ICT usage and development of basic school teacher pedagogy competences for global competitiveness in Nigeria. *UNIZIK Journal of Educational Management and Policy*.
- Olurinola, O., & Olugbade, D. (2024). The impact of UNESCO MGIEP digital teacher training on Nigerian educators' digital pedagogy competence and confidence. *African Journal of Teacher Education*, 13(2). <https://doi.org/10.21083/ajote.v13i2.7765>
- Oni, E. (2023). Assessing ICT proficiency among secondary school teachers: Bridging the digital divide. *International Journal of Pedagogics*, 3(8), 1–5.
- Rivers State Senior Secondary Schools Board. (2025, August 28). *Summary of teaching staff data—August 2025* [Unpublished statistical report]. Statistics Unit, Planning, Research and Statistics Department.