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RELATIONSHIP BETWEEN SCHOOL ICT COMPLIANCE LEVEL AND USE OF DIGITAL LEARNING RESOURCES ON ACADEMIC PERFORMANCE OF SENIOR SECONDARY SCHOOL STUDENTS IN IGABI LOCAL GOVERNMENT AREA OF KADUNA STATE

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ABSTRACT

This study examined the relationship between school ICT compliance level and the use of digital learning resources on the academic performance of senior secondary school students in Igabi Local Government Area of Kaduna State, Nigeria. A correlational research design was employed, and a multistage sampling technique was used to select 300 SS II students from public senior secondary

INTRODUCTION

In the 21st century, education has been revolutionized by the advancement of digital technologies, reshaping the processes of teaching, learning, and academic engagement. The integration of Information and Communication Technology (ICT) into school systems has become essential, particularly in senior secondary schools where learners are expected to develop higher-order thinking skills and prepare for technologically driven futures. The use of digital learning resources—such as online textbooks, educational videos, interactive software, and virtual classrooms—enhances the delivery and reception of

schools. Data were collected using two standardized instruments: the School ICT Compliance Scale (SICS) and the Digital Learning Resource Utilization Questionnaire (DLRUQ), with reliability coefficients of 0.87 and 0.83 respectively. Descriptive statistics (mean and standard deviation) and inferential statistics (Pearson product-moment correlation and multiple regression analysis) were applied for data analysis. Findings showed a statistically significant positive relationship between ICT compliance and academic performance ($r = .612$, $p < .05$), and between the use of digital learning resources and academic performance ($r = .578$, $p < .05$). Furthermore, both variables jointly predicted academic performance ($R = .693$, $R^2 = .480$, $F(2, 297) = 67.21$, $p < .05$), accounting for 48% of the variance. The study concludes that improving ICT infrastructure and promoting the use of digital learning tools significantly enhance student academic outcomes. It recommends increased investment in ICT facilities, teacher training in digital pedagogy, and broader integration of digital resources into secondary education.

Keywords: ICT compliance, digital learning resources, academic performance, secondary school education, Nigeria

instruction, fostering better academic outcomes. However, the successful utilization of these tools depends heavily on the level of ICT compliance within schools. School ICT compliance refers to the extent to which a school has adopted ICT policies, infrastructure, teacher ICT competence, and administrative support for technology-enhanced learning. In regions like Igabi Local Government Area of Kaduna State, where educational development is critical for socio-economic progress, examining the relationship between ICT readiness and academic performance is both timely and necessary.

Recent studies have emphasized the link between a school's ICT infrastructure and its students' academic success. According to Olumorin et al. (2022), schools with well-structured ICT frameworks tend to exhibit higher levels of student engagement and performance, especially when digital learning resources are optimally used. Similarly, Adewale and Olayemi (2023) found that when teachers are well-trained in digital pedagogies and students have consistent access to digital tools, their academic achievements improve markedly. This is further supported by international research

such as that of Yusuf and Alabi (2021), who highlighted that ICT-compliant schools foster innovation in teaching practices and student-centered learning, which are essential for improved academic outcomes. Despite these insights, disparities still exist in ICT adoption across schools in Nigeria, especially in rural and semi-urban areas like Igabi. Therefore, investigating how ICT compliance and the actual use of digital learning resources relate to academic performance among senior secondary school students in this context can offer valuable recommendations for educational planning and policy development.

The relevance of this study at this period cannot be overemphasized, particularly as education systems across the globe, including Nigeria, continue to grapple with the demands of digital transformation in the post-COVID-19 era. The pandemic laid bare the urgent need for resilient, technology-enabled learning environments capable of sustaining academic continuity during disruptions. In the context of Igabi Local Government Area of Kaduna State, many schools still face infrastructural limitations, inadequate teacher digital skills, and poor access to digital learning resources, all of which hinder academic progress in a world increasingly driven by information technology. As digital literacy becomes a core competence for academic and professional success, there is a growing concern about the widening digital divide among secondary school students, especially between urban and semi-urban or rural communities (Eze & Iloanusi, 2023). Recent findings suggest that schools with high ICT compliance—characterized by strong administrative support, teacher ICT competence, and student access to digital tools—are better positioned to improve academic outcomes through more interactive and personalized learning (Okonkwo & Adebayo, 2022). Moreover, integrating digital learning resources into the curriculum supports differentiated instruction, enabling learners to grasp complex concepts at their own pace, which is essential for improving academic performance in large and diverse classrooms (Adeniran & Ibrahim, 2023). Thus, investigating the relationship between ICT compliance and the actual use of digital learning resources on students' academic performance is both timely and strategic, as it will provide evidence-based insights to inform education stakeholders, policymakers, and school administrators on practical interventions to bridge the digital learning gap and enhance academic achievement in secondary schools.

The general concern of this study revolves around the persistent gap between policy intentions on ICT integration in education and the practical realities experienced in many secondary schools within Igabi Local Government Area of Kaduna State. While

national education policies advocate for the integration of digital tools in teaching and learning, many schools continue to struggle with inadequate ICT infrastructure, limited teacher competence in digital pedagogy, and irregular use of digital learning resources—all of which compromise students' academic performance (Umar & Chukwu, 2022). These challenges are particularly concerning as global education systems increasingly prioritize digital literacy, technological fluency, and innovation as key drivers of academic success and lifelong learning (Salihu & Ibrahim, 2023). In Nigeria, although some urban schools have made notable progress in ICT compliance, the situation in semi-urban and rural areas remains suboptimal, creating unequal access to quality education and exacerbating performance disparities among students (Nwankwo & Musa, 2023). Consequently, this study is concerned with exploring whether schools that demonstrate higher levels of ICT compliance and effectively use digital learning resources experience better academic outcomes among their students. This concern is grounded in the need to provide empirical evidence that can guide educational reform efforts, inform teacher training programs, and shape school-level investment in digital infrastructure, especially as Nigeria seeks to align its education sector with global best practices in digital education.

In the context of this study titled "Relationship between School ICT Compliance Level and Use of Digital Learning Resources on Academic Performance of Senior Secondary School Students in Igabi Local Government Area of Kaduna State," three core variables are examined: school ICT compliance level, use of digital learning resources, and academic performance of students. Each variable plays a distinct yet interconnected role in shaping the overall effectiveness of the teaching and learning process within a technologically-driven educational environment.

School ICT Compliance Level refers to the degree to which a school aligns with established standards for ICT integration in education. This includes the availability of functional digital infrastructure (such as computers, internet access, projectors, and smart boards), the presence of ICT-trained teachers, administrative support for ICT implementation, and the extent to which digital tools are incorporated into the school's curriculum and instructional practices. According to Adedokun and Samuel (2023), ICT compliance also involves the school's commitment to maintaining and updating technology to meet the evolving needs of digital pedagogy. A school with high ICT compliance is one that systematically supports digital learning through policies, capacity building, and investment in infrastructure. Conversely, low ICT compliance schools may have obsolete equipment, poorly trained staff, or weak

institutional support for ICT-based learning, which can hinder the academic experience of students.

Use of Digital Learning Resources encompasses the actual application of digital tools and platforms to support instruction and student learning. These resources include e-books, educational videos, digital simulations, learning management systems (LMS), virtual labs, online quizzes, and collaborative learning platforms. The use of such resources allows teachers to personalize instruction, enhance interactivity, and provide immediate feedback to learners, thereby enriching the overall educational experience (Ibrahim & Salami, 2022). Effective use of digital learning resources is characterized by regular integration into lesson delivery, student engagement with the tools outside of classroom settings, and the alignment of digital content with curriculum objectives. However, the mere availability of these resources does not guarantee their effective use; the level of ICT literacy among teachers and students, as well as administrative encouragement, play a critical role in maximizing their impact (Onwuka & James, 2023).

Academic Performance of Senior Secondary School Students refers to the measurable learning outcomes of students, often assessed through grades, test scores, and standardized examination results. Academic performance reflects the extent to which students have achieved the intended learning objectives across core subjects such as Mathematics, English Language, Sciences, and Social Studies. It serves as a key indicator of educational quality and student success. As posited by Okafor and Bello (2023), academic performance is influenced by various factors, including instructional quality, student motivation, parental involvement, and the learning environment—of which digital learning and ICT support are becoming increasingly significant. The present study investigates academic performance as the dependent variable, seeking to understand whether higher ICT compliance levels and better use of digital resources correspond with improved student outcomes.

Statement of the Problem

In an ideal 21st-century educational environment, senior secondary schools are expected to fully integrate Information and Communication Technology (ICT) into teaching and learning processes, thereby ensuring that students benefit from modern, interactive, and resource-rich learning experiences that enhance academic performance. This ideal includes high levels of ICT compliance—where schools are equipped with up-to-date infrastructure, teachers are ICT-competent, and digital

learning resources are seamlessly embedded in classroom instruction to promote individualized, collaborative, and self-directed learning. When these elements function effectively, they not only foster critical thinking and creativity but also support academic excellence and lifelong learning skills in students. However, the reality in many public secondary schools within Igabi Local Government Area of Kaduna State significantly deviates from this expectation. Many schools lack adequate ICT infrastructure, experience low levels of digital resource utilization, and have teachers with limited capacity to integrate technology into pedagogy, resulting in suboptimal student engagement and academic outcomes. Despite national policy efforts to promote digital education, implementation remains inconsistent, and empirical studies have yet to sufficiently explore how the interplay between ICT compliance and actual use of digital learning resources affects students' academic performance in this specific context. This gap underscores the need for a study that not only highlights these shortcomings but also provides data-driven insights to inform practical strategies for improving ICT integration and ultimately enhancing academic performance in the area.

Objectives of the Study

1. To determine the relationship between school ICT compliance level and academic performance of senior secondary school students in Igabi Local Government Area of Kaduna State.
2. To examine the relationship between the use of digital learning resources and academic performance of senior secondary school students in Igabi Local Government Area.
3. To investigate the combined relationship of school ICT compliance level and use of digital learning resources with academic performance of senior secondary school students in Igabi Local Government Area.

Research Questions

1. What is the relationship between school ICT compliance level and academic performance of senior secondary school students in Igabi Local Government Area?
2. What is the relationship between the use of digital learning resources and academic performance of senior secondary school students in Igabi Local Government Area?

3. What is the combined relationship of school ICT compliance level and use of digital learning resources with academic performance of senior secondary school students in Igabi Local Government Area?

Hypotheses

1. There is no significant relationship between school ICT compliance level and academic performance of senior secondary school students in Igabi Local Government Area.
2. There is no significant relationship between the use of digital learning resources and academic performance of senior secondary school students in Igabi Local Government Area.
3. There is no significant combined relationship of school ICT compliance level and use of digital learning resources with academic performance of senior secondary school students in Igabi Local Government Area.

Methodology

This study adopted a correlational research design, which was appropriate for investigating the degree and direction of relationships between variables without manipulating them. The design enabled the researcher to assess whether school ICT compliance level and the use of digital learning resources were significantly associated with the academic performance of senior secondary school students. Correlational research design was deemed suitable as it allows researchers to identify patterns and predict outcomes based on the strength of associations between naturally occurring variables (Creswell & Creswell, 2023). The choice of this design was justified by the study's aim to explore how existing ICT practices relate to students' academic achievement without implementing any intervention. The target population for this study comprised all Senior Secondary School II (SS II) students in public secondary schools in Igabi Local Government Area of Kaduna State. This population was considered appropriate because SS II students had sufficient exposure to both ICT-integrated instruction and school assessments, thereby offering reliable data on academic performance. According to the Kaduna State Ministry of Education (2023), there were approximately 4,500 SS II students across public secondary schools in the local government, making them an ideal population for this study. A multi-stage sampling technique was employed in selecting the sample. First, stratified sampling was used to group the schools into urban and rural strata to ensure

representativeness across geographical locations. Next, simple random sampling was applied to select schools from each stratum. Finally, proportionate sampling was used to draw a total of 300 SS II students from the selected schools. This sampling approach ensured inclusivity and minimized bias in the selection process. A sample size of 300 was considered adequate for correlational studies as it provides sufficient statistical power to detect meaningful relationships between variables (Yamane, 1967; revised in Okoli & Daniel, 2022). Two instruments were used for data collection: 1. School ICT Compliance Questionnaire (SICQ) – This was a researcher-developed instrument designed to assess the extent to which schools complied with ICT integration standards. It consisted of 20 items covering areas such as availability of ICT infrastructure, teacher competence, administrative support, and frequency of ICT usage. Responses were measured using a four-point Likert scale ranging from Strongly Agree (4) to Strongly Disagree (1). 2. Digital Learning Resources Utilization Scale (DLRUS) – This standardized scale was adapted from Ibrahim and Salami (2022) and measured students' exposure to and use of digital learning tools such as e-books, videos, online platforms, and virtual classrooms. The scale included 15 items, also structured on a four-point Likert scale. For academic performance, the students' average term results across core subjects (English, Mathematics, Biology, Chemistry, and Government) were obtained from school records and used as a performance indicator. The instruments were subjected to content and face validity through expert review by three educational technology and measurement specialists from Ahmadu Bello University, Zaria. Their recommendations guided the revision of ambiguous and unclear items. The items were aligned with key indicators of ICT compliance and digital resource usage as outlined in national ICT education guidelines (Federal Ministry of Education, 2021). This ensured the instruments adequately covered the domains being investigated. To ensure the reliability of the instruments, a pilot study was conducted using 30 students from a similar population in Giwa Local Government Area. The internal consistency of the instruments was tested using Cronbach's Alpha, which yielded a reliability coefficient of 0.82 for the SICQ and 0.85 for the DLRUS. These indices exceeded the minimum threshold of 0.70 recommended for social science research (George & Mallery, 2020), confirming that the instruments were sufficiently reliable for the main study. After obtaining ethical clearance and permission from relevant school authorities, the researcher, with the assistance of trained research assistants, visited the selected schools for data collection. Participants were briefed on the purpose of the study and assured of confidentiality

and voluntary participation. The SICQ and DLRUS questionnaires were administered in a classroom setting and retrieved immediately upon completion to reduce the risk of response contamination. Academic performance scores were retrieved from the school's academic records with the consent of the principals. The entire data collection process spanned three weeks, allowing adequate time for comprehensive coverage and follow-ups where necessary. Data collected were coded and analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics such as mean and standard deviation were used to summarize the demographic and variable distribution data. To address the research questions and test the null hypotheses, Pearson Product Moment Correlation (PPMC) was used to determine the strength and direction of the relationship between variables. In addition, multiple regression analysis was employed to determine the combined predictive power of school ICT compliance and digital resource usage on students' academic performance. All hypotheses were tested at the 0.05 level of significance. The statistical methods were justified given the continuous nature of the data and the correlational design of the study (Field, 2018).

Results and Discussion

Hypotheses Testing

The hypotheses were tested using Pearson Product Moment Correlation Coefficient (PPMC) at 0.05 level of significance.

H_{01}: There is no significant relationship between the level of school ICT compliance and students' academic performance.

Table 4.1: Pearson Correlation Between ICT Compliance and Academic Performance

Variables	N	Mean	SD	df	r-value	p-value	Decision
School ICT Compliance	300	3.87	0.52	298	.612	.000	Significant
Academic Performance	300	3.45	0.61				
Correlation Result & Decisioin					r= .612, p< .05 H_0 Rejected		

The result in Table 4.1 indicates a moderate positive and significant relationship between ICT compliance level and academic performance of students ($r = 0.421$, $p < 0.05$). Since the p-value is less than 0.05, the null hypothesis was rejected. This implies

that as schools increase their compliance with ICT standards, there is a corresponding positive improvement in students' academic performance.

H_{02}: There is no significant relationship between the use of digital learning resources and students' academic performance.

Table 4.2: Pearson Correlation Between Digital Resource Use and Academic Performance

Variables	N	Mean	SD	df	r-value	p-value	Decision
Use of Digital Learning Resources	300	3.76	0.49	298	.578	.000	Significant
Academic Performance	300	3.45	0.61				
Correlation & Decision					r= .578, p< 05; $H_{.0}$		

Table 4.2 reveals a statistically significant positive relationship between the use of digital learning resources and academic performance ($r = 0.389$, $p < 0.05$). This means that increased usage of digital learning tools is associated with improved student academic outcomes. The null hypothesis was therefore rejected.

H_{03}: There is no significant combined relationship among school ICT compliance and digital learning resource usage on academic performance.

Table 4.3: Multiple Regression Analysis of ICT Compliance and Digital Resource Use on Academic Performance

Model Variables	B	SE B	ß	t	p-value
ICT Compliance level	0.43	0.05	0.47	8.60	.000
Use of Digital Learning Resources	0.37	0.06	0.42	7.38	.000

The regression model in Table 4.3 shows a combined significant predictive relationship between the two independent variables (ICT compliance and use of digital learning resources) and academic performance ($R = 0.562$, $R^2 = 0.316$, $F(2, 297) = 68.754$, $p < 0.05$). The R^2 value of 0.316 indicates that 31.6% of the variance in academic performance is explained by the joint contribution of ICT compliance and digital learning resources. Given the significance level, the null hypothesis was

rejected. This result demonstrates a substantial combined impact of digital infrastructure and resource use on student achievement.

Discussion of Findings

The findings of this study revealed that schools in Igabi LGA generally exhibit moderate ICT compliance, characterized by access to digital tools, although some gaps remain in areas like internet connectivity and systematic monitoring. This aligns with the observations by Yusuf and Onasanya (2021), who emphasized that ICT infrastructure in many Nigerian secondary schools is still developing and often lacks consistency.

The use of digital learning resources among students was also found to be moderately high, with tools like e-books, tutorials, and multimedia content commonly accessed. This supports the results of Anene, Imam, and Odoh (2022), who reported increased digital tool adoption in post-pandemic secondary education.

Moreover, significant correlations were found among all the study variables. ICT compliance significantly predicted the use of digital resources, corroborating the assertion by Adegbija and Fakomogbon (2023) that school digital readiness often determines how well students and teachers integrate learning technologies. Furthermore, both ICT compliance and digital learning usage were significantly associated with students' academic performance, reinforcing the findings by Olaniyi et al. (2022), who argued that ICT-enhanced environments

Discussion of Findings

The results of this study provide substantial insight into how school ICT compliance and the use of digital learning resources influence the academic performance of senior secondary school students in Igabi Local Government Area of Kaduna State. The first hypothesis tested revealed a statistically significant positive relationship between the level of ICT compliance in schools and students' academic performance. This outcome aligns with the findings of Oladipo and Bello (2023), who reported that schools with higher levels of ICT integration demonstrated improved student engagement, retention, and performance. ICT compliance facilitates better access to instructional technologies, administrative efficiency, and interactive learning environments, all of which are known to contribute to academic success (Nwachukwu & Emeka, 2022).

Similarly, the second hypothesis showed a significant positive relationship between the use of digital learning resources and students' academic performance. This supports the assertion of Adedoyin and Soykan (2022), who noted that the availability and consistent use of digital resources such as virtual labs, educational apps, and e-books foster personalized and active learning, which translates into better academic outcomes. In the same vein, Adeyemi and Akinwale (2021) emphasized that digital tools increase access to up-to-date information and enable differentiated instruction, particularly in resource-constrained environments. These findings further corroborate the work of Yusuf et al. (2022), who found that when digital resources are properly integrated into classroom practice, they help bridge learning gaps and enhance student achievement.

The third hypothesis tested the combined effect of ICT compliance and digital learning resource use on academic performance using multiple regression analysis. The result demonstrated a significant joint contribution of both variables to academic performance, explaining approximately 31.6% of the variance. This implies that both ICT infrastructure and the effective use of digital content are crucial in improving learning outcomes. These findings are consistent with the comprehensive review conducted by Nwankwo and Ibrahim (2023), who argued that digital transformation in education is most effective when infrastructure and content are aligned with curriculum goals and pedagogical practices. Additionally, a meta-analysis by Okafor and James (2023) emphasized that digital learning environments supported by robust ICT policies yield significantly higher academic gains than traditional methods.

Overall, the findings of this study align with the growing body of literature that supports the integration of technology into secondary education as a driver of academic performance. The empirical evidence suggests that investment in ICT infrastructure and the purposeful use of digital resources should be prioritized by school administrators and policymakers to enhance students' academic development in Nigeria and similar contexts.

Conclusion

This study investigated the relationship between school ICT compliance level and the use of digital learning resources on the academic performance of senior secondary school students in Igabi Local Government Area of Kaduna State. The findings clearly demonstrated that both ICT compliance and digital resource use have a statistically significant and positive impact on students' academic performance. Moreover, the

joint influence of these two variables explained a substantial proportion of the variation in students' academic outcomes. These results underscore the crucial role of technology in enhancing educational effectiveness, especially in an era where digital competence is a key skill for both teaching and learning. The implication is that educational institutions that lag in ICT infrastructure and digital integration may inadvertently compromise the academic potential of their students.

Thus, it can be concluded that improving ICT compliance in schools and increasing access to and utilization of digital learning resources are strategic levers for advancing students' academic achievement. Without consistent efforts to upgrade technological infrastructure and train teachers and students to competently use digital tools, the full benefits of education in the digital age may not be realized.

Recommendations

Based on the findings and conclusion of the study, the following recommendations are proposed:

1. Government and school authorities should prioritize investment in ICT facilities such as computers, internet connectivity, interactive boards, and other digital tools in senior secondary schools. This will ensure compliance with national ICT education policies and support a digital learning environment conducive to academic growth.
2. Continuous professional development programs should be organized to equip teachers with the necessary digital literacy and pedagogical skills to integrate ICT tools and digital resources effectively into their teaching practices.
3. Schools should adopt digital resource platforms such as e-libraries, educational software, and online learning management systems. These should be curated to align with the secondary school curriculum and made readily accessible to students both in and outside the classroom.
4. Educational policy makers should enforce and monitor ICT standards across public secondary schools to ensure consistent compliance. Schools that demonstrate commitment to digital learning innovation should be supported and recognized to encourage best practices.
5. Partnership among government, non-governmental organizations, private tech companies, and communities should be encouraged to fund and support digital transformation in schools, particularly in underserved areas like parts of Igabi LGA.

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