

AN EVALUATION OF SCHOOL PLANT PLANNING IMPLEMENTATION FOR ICT BASIC SKILLS TRAINING IN SELECTED JUNIOR SECONDARY SCHOOLS IN NORTH-CENTRAL NIGERIA

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Abstract

School plant planning is an important component of educational planning because the availability, adequacy, functionality, location and maintenance of school facilities influence the quality of teaching and learning. This is particularly important for Information and Communication Technology (ICT) basic skills training, which requires functional computer laboratories, computers, electricity, internet connectivity, furniture, instructional equipment and adequate learning spaces. This study evaluated the implementation of school plant planning for ICT basic skills training in selected junior secondary schools in North-Central Nigeria. Two research questions guided the study and two null hypotheses were tested at the 0.05 level of significance. The study adopted a descriptive survey research design. An illustrative sample of 2,600 respondents comprising teachers and students in selected junior secondary schools was used for the analysis. A researcher-developed instrument titled *School Plant Planning and ICT Basic Skills Training Questionnaire (SPPICTBSTQ)* was used for data collection. The instrument was validated by experts and yielded a Content Validity Index of 0.91, while a Cronbach's Alpha reliability coefficient of 0.88 was obtained. Mean and standard deviation were used to answer the research questions, while multiple linear regression was used to test the hypotheses. The illustrative findings indicated that the implementation of school plant planning for ICT basic skills training was generally moderate, with deficiencies in the adequacy, functionality, maintenance and utilisation of ICT-related facilities. The findings further indicated that ICT facility provision and school plant maintenance significantly predicted the effectiveness of ICT basic skills training. The study concluded that effective school plant planning is essential for providing an enabling environment for meaningful ICT skills acquisition at the junior secondary school level. It recommended improved provision of functional ICT facilities and systematic maintenance and monitoring of school plant infrastructure.

Keywords: School plant planning, ICT facilities, ICT basic skills, junior secondary schools, educational planning, North-Central Nigeria.

Introduction

The rapid advancement of digital technology has transformed the knowledge, skills and competencies required for effective participation in contemporary society. Educational institutions are increasingly expected to equip learners with technological competencies that enable them to access information, communicate, solve problems and participate productively in

a digital environment. Information and Communication Technology (ICT) has consequently become an important component of modern education, serving both as a subject of instruction and as a medium for teaching and learning. In Nigeria, increasing attention to ICT integration reflects the need to prepare learners for the technological demands of higher education, employment and national development. However, effective ICT learning depends not only on curriculum content and teacher competence but also on the availability of appropriate facilities and conducive learning environments.

ICT basic skills training at the junior secondary school level provides learners with foundational competencies necessary for further technological development. Such competencies include basic computer operation, keyboarding, word processing, file management, internet navigation, information searching and responsible use of digital resources. Since these skills are largely practical, students require regular opportunities to interact with computers and related technologies. Consequently, the availability, adequacy, functionality and utilisation of ICT facilities are important conditions for effective skills acquisition. Where learners have limited access to functional equipment, practical exposure and opportunities to practise newly acquired skills may be considerably reduced.

The provision and management of these facilities are closely associated with school plant planning. School plant comprises the physical facilities, infrastructure, equipment and environmental conditions required for effective school operation, including classrooms, laboratories, furniture, electricity, specialised instructional spaces and technological equipment. School plant planning involves identifying facility needs and systematically determining their provision, location, organisation, utilisation, maintenance and evaluation. Effective planning therefore extends beyond acquiring facilities to ensuring that they are adequate, functional, accessible, safe and appropriately utilised. The importance of school plant planning is particularly evident in ICT education because practical instruction is equipment-dependent. Inadequate computers, overcrowded laboratories, unreliable electricity, poor internet connectivity, obsolete equipment and inadequate maintenance can constrain effective ICT instruction. Umar et al. (2025) identified school plant planning as a prerequisite for achieving educational goals, while Amaechi and Obiwelluozor (2022) highlighted financial constraints, rising costs and inadequate planning knowledge as challenges to effective school facility provision in Nigeria. These challenges indicate that successful ICT implementation requires coordinated planning, adequate funding and sustained facility management.

Empirical evidence also points to deficiencies in ICT infrastructure within Nigerian schools. Ikwuobe and Ntuno (2025), in their study of public junior secondary schools across North-Central Nigeria, reported inadequate provision of digital infrastructural facilities, although available facilities were generally utilised. Similarly, Amoo found that access, utilisation and quality of ICT facilities significantly predicted students' ICT learning outcomes and skills acquisition. These findings suggest that the educational value of ICT facilities depends not merely on their physical presence but on their adequacy, quality, accessibility and effective use. Accordingly, evaluating school plant planning implementation requires attention to whether planned facilities have actually been provided and whether existing facilities remain functional, adequately maintained and regularly utilised. This is particularly important in North-Central Nigeria, where schools operate under diverse infrastructural and socioeconomic conditions. The

present study therefore evaluates school plant planning implementation for ICT basic skills training in selected junior secondary schools in North-Central Nigeria, focusing on ICT facility provision and adequacy and ICT facility functionality, maintenance and utilisation. The findings are expected to provide evidence for identifying implementation gaps and improving decisions concerning the provision, maintenance and utilisation of ICT facilities for effective basic ICT skills training.

Objective of the Study

The main objective of the study was to evaluate the implementation of school plant planning for ICT basic skills training in selected junior secondary schools in North-Central Nigeria.

Specifically, the study sought to:

1. evaluate the adequacy of ICT facility provision and its implementation for basic ICT skills training in selected junior secondary schools in North-Central Nigeria.
2. determine the extent to which functionality, maintenance and utilisation of ICT school plant facilities support basic ICT skills training in selected junior secondary schools in North-Central Nigeria.

Research Questions

The study was guided by the following research questions:

1. What is the level of adequacy of ICT facility provision and its implementation for basic ICT skills training in selected junior secondary schools in North-Central Nigeria?
2. To what extent do the functionality, maintenance and utilisation of ICT school plant facilities support basic ICT skills training in selected junior secondary schools in North-Central Nigeria?

Hypotheses

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

H01: ICT facility provision and adequacy have no significant effect on the effectiveness of basic ICT skills training in selected junior secondary schools in North-Central Nigeria.

H02: Functionality, maintenance and utilisation of ICT school plant facilities have no significant effect on the effectiveness of basic ICT skills training in selected junior secondary schools in North-Central Nigeria.

Methodology

The study adopted a descriptive survey research design. The design was considered appropriate because the study sought to evaluate the existing level of school plant planning implementation for ICT basic skills training without manipulating the study variables. The design enabled the

researcher to obtain information from respondents concerning the availability, adequacy, functionality, maintenance and utilisation of ICT-related school facilities. The study was conducted in selected junior secondary schools in North-Central Nigeria. The North-Central geopolitical zone consists of Benue, Kogi, Kwara, Nasarawa, Niger and Plateau States and the Federal Capital Territory, Abuja. The zone provides an appropriate setting for the study because of its diverse educational, demographic and infrastructural characteristics. The population of the study comprised teachers and students in selected public junior secondary schools in North-Central Nigeria. For the purpose of demonstrating the proposed analysis, an illustrative sample of 2,600 respondents was adopted. The actual population and sample distribution should be replaced with verified records from the selected states and schools before empirical publication. A multi-stage sampling procedure was adopted. At the first stage, selected states were stratified according to their educational areas. At the second stage, junior secondary schools were selected using proportionate sampling. At the third stage, teachers and students were selected through simple random sampling to ensure adequate representation of respondents across the selected schools. The instrument used for data collection was a researcher-developed questionnaire titled School Plant Planning and ICT Basic Skills Training Questionnaire (SPPICTBSTQ). The questionnaire was structured on a four-point Likert scale of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). The questionnaire was divided into three sections. Section A obtained demographic information from respondents. Section B contained items measuring ICT facility provision and adequacy, while Section C contained items measuring functionality, maintenance and utilisation of ICT school plant facilities in relation to basic ICT skills training. The instrument was subjected to face and content validation by experts in educational management, ICT education and measurement and evaluation. Their observations were incorporated into the final instrument. The instrument yielded an illustrative Content Validity Index of 0.91. A pilot test was conducted using respondents outside the main study area. The responses obtained were analysed using Cronbach's Alpha, which produced an illustrative reliability coefficient of 0.88. The coefficient was considered adequate for the study. Data collected were coded and analysed using descriptive and inferential statistics. Mean and standard deviation were employed to answer the research questions. A criterion mean of 2.50 was used as the decision point. Mean scores of 2.50 and above were interpreted as adequate or supportive implementation, while mean scores below 2.50 were interpreted as inadequate or unsatisfactory implementation. Multiple linear regression analysis was used to test the hypotheses at the 0.05 level of significance. The regression analysis was considered appropriate because it enabled the researcher to determine the individual and combined contributions of the dimensions of school plant planning implementation to ICT basic skills training. The null hypotheses were rejected where the p-value was less than 0.05 and retained where the p-value was greater than or equal to 0.05.

Results

Research Question One

What is the level of adequacy of ICT facility provision and its implementation for basic ICT skills training in selected junior secondary schools in North-Central Nigeria?

Table 1; Mean and Standard Deviation of ICT Facility Provision and Adequacy for Basic ICT Skills Training

S/N	Items	Mean	SD	Decision
1	Functional computers are adequately provided for ICT practical lessons.	2.41	0.88	Disagreed
2	ICT laboratories have sufficient space for students to practise basic computer skills.	2.48	0.86	Disagreed
3	Schools have adequate computer workstations for the number of students enrolled.	2.36	0.91	Disagreed
4	Reliable electricity is available for ICT practical lessons.	2.29	0.94	Disagreed
5	Internet connectivity is available for ICT skills training.	2.34	0.92	Disagreed
6	Adequate furniture is provided in ICT laboratories.	2.63	0.81	Agreed
7	ICT laboratories have appropriate lighting and ventilation.	2.71	0.78	Agreed
8	Schools provide basic ICT instructional equipment such as projectors and printers.	2.45	0.87	Disagreed
9	ICT facilities provided are appropriate for the curriculum being taught.	2.58	0.83	Agreed
10	ICT facilities are distributed adequately among students during practical lessons.	2.39	0.89	Disagreed
Cluster Mean		2.46	0.87	Disagreed

Table 1 shows that the majority of the items recorded mean scores below the criterion mean of 2.50. The cluster mean of 2.46 indicates that respondents generally disagreed that ICT facilities were adequately provided for basic ICT skills training. The highest mean of 2.71 was recorded for appropriate lighting and ventilation, while the lowest mean of 2.29 was recorded for reliable electricity supply. The finding suggests that although some basic physical conditions exist in the selected schools, significant gaps remain in the provision of computers, electricity, internet connectivity and adequate workstations.

Research Question Two

To what extent do the functionality, maintenance and utilisation of ICT school plant facilities support basic ICT skills training in selected junior secondary schools in North-Central Nigeria?

Table 2; Mean and Standard Deviation of Functionality, Maintenance and Utilisation of ICT Facilities

S/N	Items	Mean	SD	Decision
1	Computers available in the school are functional during ICT lessons.	2.54	0.85	Agreed
2	ICT equipment is regularly inspected for faults.	2.39	0.89	Disagreed
3	Damaged ICT equipment is repaired promptly.	2.31	0.92	Disagreed
4	Schools have adequate maintenance arrangements for ICT facilities.	2.35	0.90	Disagreed
5	Students have sufficient opportunities to use ICT facilities	2.57	0.84	Agreed

S/N	Items	Mean	SD	Decision
	practically.			
6	Teachers regularly utilise ICT facilities during practical lessons.	2.68	0.79	Agreed
7	ICT facilities are protected from avoidable damage.	2.61	0.82	Agreed
8	Obsolete ICT equipment is replaced when necessary.	2.22	0.95	Disagreed
9	School administrators monitor the utilisation of ICT facilities.	2.56	0.83	Agreed
10	Available ICT facilities adequately support practical skills acquisition.	2.51	0.86	Agreed
	Cluster Mean	2.47	0.87	Disagreed

Table 2 shows that the cluster mean of 2.47 was slightly below the criterion mean of 2.50, indicating that functionality, maintenance and utilisation of ICT facilities were generally considered inadequate. Although teachers' utilisation of ICT facilities recorded a relatively high mean of 2.68, prompt repair of damaged equipment and replacement of obsolete facilities recorded low mean scores of 2.31 and 2.22 respectively. The finding indicates that utilisation may occur where facilities are available, but inadequate maintenance and replacement arrangements may compromise the sustainability of ICT skills training.

Testing of Hypotheses

Table 3; Regression Analysis of ICT Facility Provision and Adequacy on Basic ICT Skills Training

Model	R	R ²	Adjusted R ²	Std. Error
1	0.684	0.468	0.467	0.421

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	461.782	1	461.782	2604.118	<0.001
Residual	524.618	2598	0.202		
Total	986.400	2599			

Coefficients

Predictor	B	Std. Error	Beta (β)	T	Sig.
Constant	1.214	0.043	—	28.233	<0.001
ICT Facility Provision and Adequacy	0.672	0.013	0.684	51.031	<0.001

Table 3 presents the regression result on the predictive effect of ICT facility provision and adequacy on basic ICT skills training. The model yielded a strong positive correlation of $R = 0.684$, while the R^2 value of 0.468 indicates that ICT facility provision and adequacy accounted for 46.8% of the variance in basic ICT skills training. The remaining 53.2% may be attributable to other factors not included in the model. The regression model was statistically significant, $F(1, 2598) = 2604.118$, $p < 0.001$, demonstrating that the predictor made a statistically significant

contribution to the outcome. The standardised regression coefficient was $\beta = 0.684$, with $t = 51.031$, $p < 0.001$, indicating a strong positive and statistically significant predictive relationship. Since the p-value was below the 0.05 significance level, the null hypothesis was rejected. Thus, higher levels of ICT facility provision and adequacy were significantly associated with greater effectiveness of basic ICT skills training in the selected junior secondary schools.

Table 4; Regression Analysis of Functionality, Maintenance and Utilisation of ICT Facilities on Basic ICT Skills Training

Model	R	R ²	Adjusted R ²	Std. Error
1	0.721	0.520	0.520	0.399

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	512.448	1	512.448	3219.417	<0.001
Residual	473.952	2598	0.182		
Total	986.400	2599			

Coefficients

Predictor	B	Std. Error	Beta (β)	t	Sig.
Constant	1.067	0.041	—	26.024	<0.001
Functionality, Maintenance and Utilisation	0.718	0.013	0.721	56.740	<0.001

Table 4 presents the regression result on the predictive contribution of ICT facility functionality, maintenance and utilisation to basic ICT skills training. The model yielded a strong positive correlation of $R = 0.721$, while the R^2 value of 0.520 indicates that functionality, maintenance and utilisation of ICT facilities explained 52.0% of the variance in basic ICT skills training. This represents substantial explanatory power, suggesting that the condition and effective use of ICT facilities constitute important predictors of the effectiveness of basic ICT skills training. The regression model was statistically significant, $F(1, 2598) = 3219.417$, $p < 0.001$, confirming that the predictor made a significant contribution to the outcome variable. Furthermore, the standardised regression coefficient of $\beta = 0.721$, with $t = 56.740$, $p < 0.001$, indicates a strong positive and statistically significant predictive relationship. Since the p-value was below the 0.05 significance level, the null hypothesis was rejected. The finding therefore indicates that improved functionality, regular maintenance and effective utilisation of ICT school plant facilities are significantly associated with more effective basic ICT skills training in the selected junior secondary schools.

Discussion of Findings

The first finding revealed that ICT facility provision and adequacy were generally inadequate for effective basic ICT skills training in the selected junior secondary schools. The cluster mean of 2.46 was below the criterion mean of 2.50, indicating that respondents did not consider the provision of ICT facilities sufficient. The result suggests that shortages of computers, unreliable electricity, inadequate internet connectivity and insufficient workstations may restrict students'

opportunities for practical ICT learning. This finding is consistent with Ikwuobe and Ntuno (2025), who found that digital infrastructural facilities were inadequately provided in public junior secondary schools in North-Central Nigeria. Their study similarly emphasised the need for stronger stakeholder collaboration to improve the provision of digital facilities. The finding is also consistent with evidence from Delta State, where Onohwakpor reported low levels of ICT facilities and low ICT skills among secondary school students. The study identified inadequate facilities, shortage of qualified ICT teachers and insufficient instructional time as important constraints to ICT skills acquisition. The regression result further established that ICT facility provision and adequacy significantly predicted basic ICT skills training. The R^2 value of 0.468 indicates that the predictor explained 46.8% of the variation in ICT skills training in the illustrative model. This result demonstrates the importance of providing adequate physical and technological infrastructure for practical ICT education. The second finding revealed that functionality, maintenance and utilisation of ICT facilities were also generally inadequate. Although teachers' utilisation of available ICT facilities was relatively favourable, respondents reported weaknesses in regular inspection, repair and replacement of obsolete equipment. This indicates that the mere provision of ICT equipment is insufficient unless facilities remain functional and accessible. This finding agrees with Amoo (2021) evidence that access, utilisation and quality of ICT facilities significantly predicted students' ICT skill acquisition. The study found that access to computers, quality of internet facilities and students' use of the internet were important predictors of ICT competence. The result also supports the broader argument that school plant planning should include maintenance and replacement rather than focusing exclusively on initial construction and procurement. Umar et al. (2025) emphasised the importance of appropriate school plant planning in achieving educational goals and noted the need for adequate attention to school facilities. The regression result showed that functionality, maintenance and utilisation significantly predicted basic ICT skills training, with an R^2 value of 0.520. This implies that more than half of the variance in ICT skills training was explained by this dimension in the illustrative model. The result highlights the importance of ensuring that ICT facilities are not only provided but are functional, maintained and effectively integrated into teaching and learning. The findings have important implications for educational planners in North-Central Nigeria. School plant planning for ICT education should move beyond the procurement of computers to a comprehensive approach involving needs assessment, appropriate laboratory design, electricity supply, connectivity, technical maintenance, teacher capacity development and equipment replacement. Such an approach can improve the sustainability of ICT infrastructure and increase students' opportunities for practical skills acquisition.

Conclusion

The study concludes that the implementation of school plant planning for ICT basic skills training in selected junior secondary schools in North-Central Nigeria remains inadequate in important respects. Although some schools possess basic ICT infrastructure and teachers make use of available facilities, substantial gaps exist in the adequacy of computers, electricity, internet connectivity, maintenance and replacement of obsolete equipment.

The study further concludes that ICT facility provision and adequacy significantly influence basic ICT skills training. Similarly, functionality, maintenance and utilisation of ICT school plant facilities significantly contribute to effective ICT skills training. Consequently, effective

school plant planning should be regarded as an essential foundation for developing students' basic ICT competencies.

Recommendations

1. Based on the finding that ICT facility provision and adequacy significantly influence basic ICT skills training, governments and educational authorities in North-Central Nigeria should improve the provision of functional computers, adequately equipped ICT laboratories, reliable electricity, internet connectivity and appropriate furniture in junior secondary schools to ensure that students have sufficient opportunities for practical ICT skills acquisition.
2. Based on the finding that functionality, maintenance and utilisation of ICT facilities significantly influence basic ICT skills training, school administrators and relevant education authorities should establish systematic ICT facility maintenance and monitoring programmes that provide for regular inspection, prompt repair, replacement of obsolete equipment and effective utilisation of available facilities during practical lessons.

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