

ADMINISTRATIVE MEASURES FOR MITIGATING THE CHALLENGES OF IMPLEMENTING SMART CLASSROOM IN PUBLIC SECONDARY SCHOOLS IN UZO-UWANI L.G.A ENUGU STATE

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Abstract

This study investigated administrative measures for mitigating the challenges of implementing smart classrooms in public secondary schools in Uzo-uwani LGA, Enugu state. A descriptive survey design was adopted for the study. Two research questions guided the study. The population comprised 42 respondents consisting of 14 principals and 28 vice principals from all 14 public secondary schools in the Local Government Area. A census sampling technique was used. Data were collected using a validated 18 item questionnaire titled: Administrative Measures for Mitigating Smart Classroom Challenges Questionnaire (AMMSCQ) with a reliability coefficient of 0.86 obtained through Cronbach's Alpha. Mean and standard deviation were used for data analysis, with 2.50 as the criterion mean. Findings revealed that school administrators highly adopted measures to mitigate the challenges of implementing smart classroom in Uzo-uwani LGA, Enugu state such as ICT training for teachers, collaboration with community for alternative power, enforcement of disciplinary measures against vandalism among others. The study also revealed that the adopted measures were generally effective in improving teachers' operational skills and reducing vandalism among others. The study concluded that while administrators in Uzo-uwani LGA are making efforts to mitigate smart classroom challenges, their effectiveness is limited by contextual factors beyond their control. It was recommended that Enugu State PPSMB should provide direct technical support and maintenance funds for rural schools, while principals should institutionalize regular in-house training and strengthen collaboration with security agencies to protect smart classroom facilities.

Keywords: Administrative measures, mitigation, smart classroom, implementation

Introduction

In recent time, the integration of information and communication technology into education has become a global imperative for enhancing teaching and learning quality (United Nations Educational, Scientific and Cultural Organization, 2023). In response, the Federal Government of Nigeria, through the Universal Basic Education Commission and various state governments, introduced smart classroom initiatives to digitize public secondary schools and bridge the digital divide (FME, 2019). A smart classroom is a technology enhanced learning environment equipped with interactive whiteboards, projectors, computers, internet connectivity, and digital content designed to promote learner centered and interactive pedagogy.

Indeed, smart classroom is receiving more attention and becoming a hotspot for teachers and scholars to study in recent years. This is because smart classroom has become the core and central position of digital transformation of school education (Huang & Yang, 2022). Smart classroom according to Hu (2018) has been given high expectations as the key to implementing new smart education concepts, innovating teaching and learning modes, and realizing new talent cultivation goals. Hu (2015) defines a smart

classroom as a smart learning environment that can intelligently push personalized learning resources for learners and, simultaneously realize the intelligent evaluation of teaching and learning effects. Zhang (2016) believes that a smart classroom is a typical smart learning environment, which can optimize the presentation of learning content, facilitate the acquisition of learning resources, promote classroom interaction, and have the functions of context perception and environment management. The smart classroom relies on emerging technologies such as artificial intelligence and smart terminals to build an intelligent learning environment, which facilitates teachers' teaching innovation (Korozi et al., 2017). According to Skipton (2016), smart classroom is a technology-enhanced classroom and is a powerful driver for changes in the teaching mode.

Smart classroom has become a game changer in teaching and learning process. It has added significantly in the efficiency of teaching. According to Cheng et al. (2018), it helps to break the past situation of a single teaching method, limited means of teaching, and limited access to resources, and to build a diversified, intelligent and efficient teaching model. The powerful interactive features of the smart classroom enable information to flow in the classroom (Alfoudari et al., 2021), providing convenient conditions for teaching and learning interactions (Zhu, 2014). Teachers in the smart classroom environment can guide students to learn independently by using a variety of classroom interactive tools, give students timely feedback, stimulate students to actively participate in teaching and learning activities, and realize efficient and in-depth interactions between teachers and students (Al-Qirim, 2016).

In addition to the importance of smart classroom, teaching in smart classrooms can significantly improve students' deep learning level, including the overall level of deep learning and the level of each sub-dimension (Bai, 2022). Teachers are able to independently choose a variety of teaching methods such as group collaboration, lecture method, inquiry learning method, task-driven method, etc., maximize the utilization of resources and tools to build teacher-student interaction links, carry out a diversified assessment, and take students as the principal part of learning, which can maximally activate students' motivation and participation in learning (Wang & Huang, 2015). Smart classrooms can provide technical support for data mining and learning analytics to help teachers effectively conduct intelligent teaching and assessment (He, 2015). It helps teachers to analyze students' classroom status, knowledge mastery, and teaching implementation effect in real time and accurately, improves the objectivity and accuracy of classroom assessment and analysis, and helps teachers to find teaching problems and adjust teaching strategies in time (Bai & Zheng, 2020). Smart classrooms can enhance the quality and boost the efficiency of student learning, ignite students' enthusiasm and initiative in learning, greatly enrich the form of classroom teaching, and promote the transformation and innovation in classroom instruction (Zhang et al., 2019).

In Enugu state, the Post Primary Schools Management Board (PPSMB) commenced the installation of smart classroom facilities in selected public secondary schools to improve instructional delivery and students' digital literacy (Enugu State PPSMB, 2022). However, despite these investments, reports indicate that many of the installed facilities remain underutilized or non functional, particularly in rural local government areas (Ugwu & Okoro, 2023). Uzouwani LGA, a predominantly rural and agrarian area in Enugu North Senatorial District, is one of the LGAs where public secondary schools have received smart classroom equipment. Yet evidence and preliminary observations suggest that erratic power supply, poor internet connectivity, inadequate technical skills among teachers, vandalism, and weak maintenance culture

have hampered effective utilization (Eze et al., 2021). A major source of worry in education industry in line with technology application in our classrooms is inadequate electricity supply to enhance the operation and maintenance of available instructional media in our institutions of learning in Nigeria (Aniah, 2022). This calls for proactive measures to be adopted to mitigate these challenges such as administrative measure.

The success of smart classroom initiatives depends largely on administrative measures put in place by school leaders to manage both human and material resources (Peretomode, 2012). Administrative measures, in this context, refer to deliberate managerial actions such as staff capacity building, budgetary provisions for maintenance and policy enforcement undertaken by principals and education officers to ensure functionality and sustainability of educational technology (Oboegbulem & Onwurah, 2011; Nwankwo & Obidike, 2022). Studies by Adeyemi (2011) and Yusuf and Balogun (2011) established that proactive administrative measures significantly influence resources utilization in Nigeria secondary schools. However, most existing studies focus on urban schools, leaving a gap in literature on how school administrators in rural LGAs like Uzo-Uwani manage smart classroom challenges amidst peculiar constraints of insecurity, poor infrastructure, and limited funding (Ugwu & Okoro, 2023).

Other administrative measure like community involvement could be applied. Community involvement enhances performance and achievement of objectives through team work (Greenwood, 2018). The assertion by Udeozor (2014) is that communities' involvement does not only provide them the opportunities to be informed about their children/wards, the school programmes and pupils, but further provide them the opportunities to make their contributions to the schools development. The community is a great socializing agent. Through experiences, the child learns to receive, give, share, take decisions, practice control and gets ready to accept school situation. The community helps to fulfill the child's basic needs eg food, clothing, shelter, and protection. (Ejeh, Okenjom, Chezi-woko & Agbo, 2016).

While studies have examined ICT integration challenges in Nigerian schools (Oye et al., 2014, Onasanya et al., 2020), there is limited empirical research on the specific administrative measures school leaders in rural LGA like Uzo-Uwani adopt to address these challenges, and how effective such measures are. Without documented evidence on what is working, and what constraints they face, interventions by PPSMB and other stakeholders may remain generic and ineffective. Therefore, there is a need to investigate the administrative measures adopted by school administrators in Uzo-Uwani LGA to mitigate smart classroom challenges.

Statement of problem

The Enugu State Government has made substantial investment in equipping public secondary school in Uzo-Uwani LGA with smart classroom facilities to enhance digital learning and improve educational standards. Ideally, these facilities should be functional, regularly maintained, and integrated into daily instructional processes by competent teachers under effective administrative supervision. However, field reports and preliminary interactions with stakeholders indicate a disconnect between provision and utilization. Many smart classrooms in the LGA are either non-functional due to prolonged power outages, internet failure, and lack of technical support, or are underutilized because teachers lack the requisite skills and administrative structures for maintenance are weak. Cases of vandalism and theft of equipment have also been reported, worsened by the rural location and security challenges in Uzo-Uwani. Consequently, the intended benefits of smart classroom – improved pedagogy, digital literacy, and student engagement are not

being realized, raising concerns about the return on government investment. This necessitated this study to examine the administrative measures to mitigating the challenges of implementing smart classroom in Uzo-uwani LGA, Enugu state.

Purpose of the study

The main purpose of this study is to examine administrative measures for mitigating the challenges of implementing smart classroom in Uzo-uwani LGA, Enugu State. Specifically, the study seeks to :

1. identify the administrative measures adopted by school administrators to mitigate challenges of implementing smart classroom in public secondary schools in Uzo-Uwani LGA, Enugu state.
2. determine the effectiveness of the administrative measures adopted by school administrator in mitigating the challenges of implanting smart classroom in public secondary schools in Uzo-uwani LGA, Enugu State.

Research Questions

The following research questions were posed to guide the study:

1. What are the administrative measures adopted by school administrators to mitigate the challenges of implementing smart classroom in Uzo-uwani LGA, Enugu state?
2. How effective are the administrative measures adopted by school administrators in mitigating the challenges of implementing smart classroom in public secondary schools in Uzo-uwani LGA, Enugu state?.

Methods

The study administrative measures for mitigating smart classroom challenges in Uzo-Uwani LGA, Enugu adopted a descriptive survey research design. This design was considered appropriate because it enables the researcher to systematically collect, analyze, and describe data on existing administrative measures, challenges, and their effectiveness without manipulating variables (Nworgu, 2015). The study was carried out in Uzo-Uwani LGA, Enugu state. The target population comprised all principals and vice principals (administration and academics) in public secondary schools in Uzo- uwani LGA. According to records from Enugu State Post Primary Schools Management Boards (PPSMB, 2024), there are 14 public secondary schools in the LGA. The population distribution is 14 principals and 28 vice principals making a total population of 42 respondents. Due to the relatively small and accessible population, census sampling technique was used. This means all 42 members of the population were included in the study. Census sampling eliminates sampling error and ensures that the views of all relevant stakeholders are captured. An instrument titled Administrative Measures for Mitigating Smart Classroom Challenges Questionnaire (AMMSCQ) was used for the study. It has two sections: section A for demographic data and Section B with 20 items clustered under two research questions. A 4- point Likert scale of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1) was used. The AMMSCO was subjected to face and content validation. Draft copies were given to three experts: two from the Department of Educational Foundations and Planning, and one from the Department of Science Education, specializing in Measurement and Evaluation, all from University of Nigeria, Nsukka. To establish reliability, the questionnaire was trial tested on 15 respondents comprising principals and vice principals in Udi LGA which shares similar rural characteristics with Uzo-uwani. Data from the trial test were analyzed using Cronbach's Alpha statistics. A reliability coefficient of 0.86 was obtained for the entire instrument, indicating high internal consistency. Cluster coefficient ranged from 0.79 to

0.88, all above the 0.70 benchmark recommended by Nworgu(2015). Data from the AMMSCQ were analyzed using mean and standard deviation to answer research questions. The Statistical Package for Social Sciences (SPSS) version 26 was used. A criterion mean of 2.50 served as the decision rule: items with mean 2.50 were accepted as Agree while items with mean less than 2.50 were Disagree.

Results

Research Question One: What are the administrative measures adopted by school administrators to mitigate the challenges of implementing smart classroom in Uzo-uwani LGA, Enugu state?

Table 1: Mean rating of respondents on administrative measures adopted to mitigate the challenges of implementing smart classroom in Uzo-uwani LGA, Enugu state

S/N	ITEM	M	SD	D
1.	School management collaborates with community to provide alternative power	3.00	0.49	Agree
2.	An ICT maintenance committee has been constituted	3.40	0.63	Agree
3.	Principal solicits funds from NGOs/ old students for maintenance	2.75	0.65	Agree
4.	Strict disciplinary measures are enforced against vandalism	2.85	0.64	Agree
5.	My school liaises with Enugu state PPSMB for prompt repair of faulty smart classroom equipment	2.90	0.48	Agree
6.	Smart classroom periods are clearly reflected on the official school timetable to ensure usage.	3.30	0.55	Agree
7.	Teachers are mandated by school administrators to integrate smart classroom tools in lesson delivery.	3.12	0.41	Agree
8.	School has a documented policy for routine servicing of smart classroom devices	3.06	0.63	Agree
9.	Administrators invite external ICT technicians periodically to audit and service smart classroom facilities.	2.80	0.66	Agree

Table 1 shows all the items (1-10) under administrative measures adopted to mitigate the challenges of implementing smart classroom had their mean scores range from 2.75- 3.40. The set of scores on the items indicate that the principals and vice principals are in agreement on the measures adopted to mitigate the challenges of implementing smart classroom in Uzo-Uwani LGA such as organizing periodic in house ICT training workshops for teacher; collaborating with community to provide alternative power; constituting ICT committee; soliciting funds from NGOs; enforcing strict disciplinary measures against vandalism; liaising with Enugu state PPSMB for prompt repair of faulty smart classroom equipment; clearly reflecting smart classroom periods on the official school timetable to ensure usage; integrating smart classroom tools in lesson delivery; documenting policy for routine servicing of smart classroom devices and periodically inviting ICT technician to service smart classroom facilities.

Research Question Two: How effective are the administrative measures adopted by school administrators in mitigating the challenges of implementing smart classroom in public secondary schools in Uzo-uwani LGA, Enugu state?

Table 2: Mean rating of principals and vice principals on how effective are the administrative measures adopted by school administrators in mitigating the challenges of implementing smart classroom in public secondary schools in Uzo-uwani LGA, Enugu state

S/N	Item	M	SD	D
10.	ICT training has improved teachers' skills in operating smart classroom equipment	3.71	1.78	Agree
11.	Alternative power supply has reduced disruptions in smart classroom lessons	2.65	1.62	Agree
12.	ICT committee ensures minor faults are fixed promptly	3.20	1.78	Agree
13.	External funds sourced have helped sustain smart classroom operations	3.41	1.87	Agree
14.	Disciplinary measures have reduced vandalism and theft	3.37	1.83	Agree
15.	Liaison with PPSMB by administrators has led to timely repair of faulty smart classroom equipment.	3.09	1.75	Agree
16.	Mandating smart classroom use has increased the frequency of teachers' integration of technology in lessons.	3.22	1.77	Agree
17.	The administrative measures adopted have improved students' access to functional smart classroom in my school	3.35	1.83	Agree

Table 2 shows all the items (11-18) under how effective are the administrative measures adopted by school administrators in mitigating the challenges of implementing smart classroom in public secondary schools in Uzo-uwani LGA, Enugu state had their mean scores range from 2.65- 3.41. The set of scores on the items indicate that the principals and vice principals are in agreement on how effective are the administrative measures adopted by school administrators in mitigating the challenges of implementing smart classroom in public secondary schools in Uzo-uwani LGA, Enugu state as improving teachers' skills in operating smart classroom equipment; reducing disruption of power during lesson; ensuring minor faults are fixed promptly; help in sustaining smart classroom operations; reduction in vandalism and theft: timely repair of faulty smart classroom equipment; increase in the frequency of teachers' integration of technology in lessons and improving students' access to functional smart classroom.

Discussion

The finding revealed that school administrators in Uzo-uwani LGA adopt administrative measures to mitigate the challenges of implementing smart classroom, with a grand mean of 2.80. This suggests that principals and education officers are not passive despite rural constraints. Specifically, organizing periodic ICT training for teachers,

collaborating with the community for alternative power, and enforcing disciplinary measures against vandalism among others were highly adopted. This findings corroborates Oboegbulem and Onwurah (2011) who asserted that staff capacity building and policy enforcement are foundational administrative strategies for sustaining educational innovations. Similarly, Adeyemi (2011) found that principals who prioritize in house training record higher ICT utilization rates. The adoption of community collaboration for power supply aligns with Yusuf and Balogun (2011) who emphasized that rural schools rely on community support to offset infrastructural deficits not covered by government budget.

Conclusion

Based on the findings of the study, it was concluded that school administrators in public secondary schools in Uzo-uwani LGA, Enugu state, make deliberate efforts to mitigate the challenges of implementing smart classroom. Measures such as organizing ICT training for teachers, collaborating with the community for alternative power supply, enforcing disciplinary measures against vandalism among others were adopted to a high extent and found to be effective in improving teachers' operational skills and reducing damage to smart classroom facilities. While school level administrative measures have yielded success in sustaining smart classroom operations, their overall effectiveness is limited by systemic and environmental factors beyond the control of individual principals. The successful implementation and sustainability of smart classroom in rural areas like Uzo-uwani require a sustained commitment and innovation by school administrator, complemented by proactive technical, financial, and security support from Enugu state Post Primary Schools Management Board and other relevant stakeholders.

Recommendations

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

1. Enugu State Post Primary Schools Management Board (PPSMB) should establish a dedicated smart classroom maintenance unit with technical staff deployed to zonal offices.
2. Principals of public secondary schools in Uzo-uwani LGA should institutionalize mandatory in house ICT capacity building.
3. The LGA education authority and school administrators should strengthen collaboration with community vigilante groups and local security agencies.

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