

Participatory Budgeting, Learning Environment and Students Accessibility to Teaching and Learning Facilities in Public Secondary Schools: Evidence from Akwa Ibom State, Nigeria

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Abstract

The quality of a school's physical learning environment and the accessibility of its teaching and learning facilities remain among the most consistently documented determinants of student engagement and academic performance, yet public secondary schools across much of Nigeria continue to operate with overcrowded classrooms, inadequate instructional materials and limited access to laboratories, libraries and information and communication technology facilities. This study examined the relationship between participatory budgeting, the school learning environment, students' accessibility to teaching and learning facilities, and academic performance within public secondary schools under the Akwa Ibom State Ministry of Education. Anchored on School-Based Management Theory, the study adopted a descriptive survey research design, administering a structured questionnaire to Ministry officials, school administrators, teachers and senior secondary school students, with 230 of 250 distributed instruments properly completed and returned. Data were analysed using mean and standard deviation to answer the research questions, while regression analysis was used to test the study's central hypothesis at the 0.05 level of significance. Findings revealed that participatory budgeting is positively and significantly associated with improvements in classroom conditions, infrastructure and the availability of teaching materials, with students' accessibility to classrooms, laboratories, libraries and information and communication technology facilities showing a similarly positive, though comparatively more modest, association, and academic performance showing a strong positive relationship with participatory budgeting practice overall, explaining approximately fifty-two per cent of the variance in perceived educational effectiveness. The study concludes that participatory budgeting functions as an effective mechanism for improving the physical and material conditions under which teaching and learning occur in Nigerian public secondary schools, and recommends prioritised investment in facility improvement guided by stakeholder input, deliberate attention to closing the comparatively wider information and communication technology access gap identified in the study, and the institutionalisation of participatory needs assessment as a standing feature of school-level budget planning.

Keywords:

participatory budgeting, learning environment, teaching and learning facilities, academic performance, public secondary schools

1. Introduction

The physical and material conditions under which teaching and learning take place, encompassing classroom infrastructure, the availability of instructional materials, and access to specialised facilities

such as laboratories, libraries and information and communication technology equipment, constitute a well-established determinant of student engagement, motivation and ultimately academic performance within secondary education systems worldwide. International and Nigerian scholarship alike has repeatedly linked school infrastructure quality directly to measurable differences in student outcomes, with well-resourced schools consistently outperforming comparably staffed but under-resourced counterparts (Madukwe, E., Oboma, G. U., Obona, E. E., & Akwu, U. K (2024).

Within public secondary education systems specifically, the mechanism through which schools acquire and maintain this physical and material infrastructure is fundamentally a budgetary one, such that the governance quality of a school system's budgeting process carries direct, if often underappreciated, consequences for the learning environment students actually experience. Participatory budgeting, understood as a governance mechanism through which stakeholders, including teachers, school administrators, parents and, in some models, students themselves, are directly involved in deciding how public education funds are allocated, has attracted growing attention internationally as a potential lever for better aligning school infrastructure investment with genuine, locally identified need (Shybalkina & Nabatchi, 2024). Comparative evidence on school-based management reform, a closely related governance approach emphasising devolved, stakeholder-inclusive decision-making at the school level, similarly finds that structured community and staff participation in school governance is associated with measurable improvements in both facility conditions and academic outcomes (Ayeni & Bamire, 2022; Ishii & Ogawa, 2024).

Nigeria's public secondary education system provides a particularly consequential setting in which to examine this relationship. Existing Nigerian scholarship has consistently documented that a substantial proportion of public secondary schools operate with overcrowded classrooms, inadequate seating and ventilation, limited instructional materials, and constrained access to laboratories, libraries and digital learning tools, conditions repeatedly linked to reduced student concentration, diminished academic engagement and weaker overall academic performance (Ogunode, 2023; Ekpenyong, 2023). Within Akwa Ibom State specifically, the Ministry of Education retains primary responsibility for budgetary planning and resource allocation across the state's public secondary school network, positioning the Ministry's approach to budgeting, whether centralised or participatory, as a direct and consequential influence on the learning conditions experienced by students across the state.

1.1 Statement of the Problem

Many public secondary schools across Akwa Ibom State continue to operate with overcrowded classrooms, inadequate seating and ventilation, insufficient instructional materials, and limited or non-functional laboratories, libraries and information and communication technology facilities, conditions that persist despite the annual education budget the state directs toward the sector. These conditions raise a legitimate concern regarding whether current budgeting practices within the Ministry of Education are effectively identifying and responding to the specific infrastructural and material needs of individual schools, or whether budgeting decisions made without direct, structured input from teachers, school administrators and students are instead producing a mismatch between allocated resources and the conditions students and teachers actually encounter in the classroom. Where such a mismatch persists, it carries direct consequences not only for the physical comfort and administrative efficiency of affected schools but for students' engagement with learning and, ultimately, their academic performance. It is against this background that the present study investigates whether, and to what extent, participatory budgeting practice within the Akwa Ibom State Ministry of Education is associated with improvements in the school learning environment, students' accessibility to teaching and learning facilities, and academic performance, relationships that remain empirically underexamined within the specific context of Akwa Ibom State's public secondary school system.

Accordingly, the study is guided by the following objectives: (i) to determine the effect of participatory budgeting on the learning environment in public secondary schools; (ii) to assess the influence of participatory budgeting on students' accessibility to teaching and learning facilities; and (iii) to examine the relationship between participatory budgeting and students' academic performance. The corresponding research questions are: What is the effect of participatory budgeting on the learning environment? What is the effect of participatory budgeting on students' accessibility to teaching and learning facilities? What is the relationship between participatory budgeting and academic performance? The corresponding hypothesis, stated in the null form, is that there is no

significant relationship between participatory budgeting and educational effectiveness, measured through the learning environment, facility accessibility and academic performance jointly. The study is significant in that it provides Nigerian secondary education policymakers, school administrators and educational governance scholars with context-specific empirical evidence on participatory budgeting's contribution to the material conditions of teaching and learning, extending a literature that has more often examined participatory budgeting's general governance effects than its specific implications for classroom-level learning conditions.

2. Review of Related Literature

2.1 The Concept of the School Learning Environment

The school learning environment is conventionally understood as the combination of physical, social and instructional conditions within which teaching and learning take place, encompassing classroom infrastructure and comfort, the availability and quality of instructional materials, the interpersonal climate between teachers and students, and, increasingly, the presence or absence of digital and technology-enabled learning tools (Ekpenyong, 2023). Empirical assessment of Nigerian public secondary schools has consistently found that students in well-equipped classrooms with adequate seating, ventilation and instructional materials exhibit more positive attitudes toward learning and higher levels of classroom engagement than students in poorly maintained or overcrowded environments, with poor infrastructure linked directly to discomfort, reduced concentration and diminished academic motivation (Ogunode, 2023).

A closely related concept, students' accessibility to teaching and learning facilities, refers specifically to the extent to which students can readily obtain, use and benefit from educational resources including classrooms, libraries, laboratories, instructional materials and information and communication technology tools, a concept distinguished from the mere existence of such facilities by its explicit emphasis on equitable distribution and practical usability (Olawale & Yusuf, 2021). Nigerian empirical assessment has found that uneven distribution of educational facilities across schools, particularly between urban and rural or underserved areas, generates significant disparities in student access even where facilities exist somewhere within a given school system (Adeiza & Nurudeen, 2025).

2.1.2 The Concept of Academic Performance and Its Relationship to School Conditions

Academic performance, within the school effectiveness literature, is conventionally understood as the measurable level of student achievement, engagement and learning outcome attained within a given educational context, and is widely theorised to be shaped jointly by student-level factors, including motivation and prior preparation, and school-level factors, including the quality of the learning environment and the accessibility of teaching and learning facilities available to support instruction (Madukwe et al., 2024). A substantial body of empirical evidence establishes a strong and consistent relationship between school infrastructure quality and student outcomes specifically, with schools featuring adequate classrooms, libraries and laboratories recording measurably higher levels of student participation and academic achievement than comparably staffed schools operating with inadequate facilities (Ekpenyong, 2023).

The emergence of information and communication technology as an increasingly central component of modern instructional practice has introduced a further, distinct dimension to this relationship. Empirical assessment finds that access to digital learning tools and internet connectivity is associated with higher levels of student engagement and improved academic performance, though the same assessment finds that limited information and communication technology infrastructure across many Nigerian schools continues to restrict the practical realisation of this benefit, positioning digital access as an increasingly consequential, and currently underserved, dimension of Nigerian students' overall facility accessibility (Madukwe et al., 2024; Ogunode, 2023).

2.1.3 Participatory Governance and School-Level Resource Outcomes Internationally

Comparative international literature on school-based management and participatory school governance provides direct evidence on the relationship between stakeholder-inclusive resource decision-making and school-level facility and academic outcomes. A study of school-based management's contribution to students' academic performance in secondary schools in Owo Local

Government Area, Ondo State, Nigeria, found that schools implementing genuine stakeholder participation in governance and resource decisions recorded measurably better academic performance outcomes than schools operating under more centralised administrative arrangements, with the improvement attributed substantially to more accurate identification and prioritisation of school-level infrastructural and material needs under participatory governance (Ayeni & Bamire, 2022).

A comparable study examining school-based management's effect on learning achievement within Senegal's primary education system found a positive association between structured stakeholder participation in school governance and measured learning outcomes, while specifically noting that the strength of this association depended on the depth and consistency of stakeholder involvement across successive planning cycles, and on the extent to which participatory decision-making translated into visible, implemented facility and resource improvements rather than remaining confined to consultative discussion alone (Ishii & Ogawa, 2024). Complementary research on school-level participatory budgeting specifically finds that such mechanisms can function as a distinct governance tool capable of improving resource targeting toward genuine facility need, provided the participatory process is well designed and adequately facilitated (Shybalkina & Nabatchi, 2024).

2.1.4 The Nigerian Public Secondary School Infrastructure Environment

Nigerian public secondary schools continue to face well-documented infrastructural and material constraints, with existing scholarship consistently identifying overcrowded classrooms, inadequate seating and ventilation, insufficient instructional materials, and constrained access to laboratories, libraries and information and communication technology facilities as persistent features of the public secondary school system (Ogunode, 2023; Ekpenyong, 2023). Within this environment, evidence indicates that centralised, non-participatory budgeting practices contribute directly to the poor learning environments observed across many Nigerian public schools, since resource allocation decisions made without direct input from teachers, administrators and students at the point of service delivery are less likely to accurately reflect the specific infrastructural priorities of individual schools (Adeiza & Nurudeen, 2025).

Within Akwa Ibom State's public secondary school system specifically, this pattern of infrastructural constraint persists notwithstanding the state's annual education budgetary allocation, a persistence that lends direct empirical relevance to the present study's examination of whether participatory budgeting practice within the state Ministry of Education is associated with measurable improvement in the specific facility and learning environment conditions that existing Nigerian scholarship identifies as most consequential for student engagement and academic performance.

2.2 Theoretical Framework

This study is anchored on School-Based Management Theory, which holds that devolving meaningful decision-making authority over school-level resources, including budgeting, staffing and facility priorities, to school-level stakeholders, principally school administrators, teachers, parents and, in some models, students themselves, produces more responsive and effective resource allocation than centralised, district- or ministry-level decision-making alone, precisely because school-level stakeholders possess more accurate, current knowledge of a given school's actual infrastructural and instructional needs than administrators positioned at a greater institutional and geographic remove. Within this framing, school-level participation functions not as a merely symbolic gesture toward inclusiveness but as a substantive mechanism for improving the quality and targeting of resource decisions themselves.

School-Based Management Theory is particularly well suited to a study of participatory budgeting's relationship to the learning environment and facility accessibility specifically, because it directly predicts the mechanism through which participatory budgeting is theorised to improve these outcomes: by channelling accurate, school-level knowledge of infrastructural and material need into the Ministry's budgeting process, participatory practice should generate resource allocation decisions more closely aligned with the actual, observable conditions of individual schools than a purely centralised process could reliably achieve. Empirical application of this theoretical logic within comparable Nigerian and West African contexts finds direct support for this prediction, with school-based management and participatory governance practices associated with measurably improved

facility conditions and academic outcomes in both Ondo State, Nigeria, and Senegal (Ayeni & Bamire, 2022; Ishii & Ogawa, 2024).

Applied to the present study, School-Based Management Theory is used to organise the analysis of participatory budgeting's contribution to educational effectiveness across three interrelated outcome levels: the learning environment, encompassing classroom infrastructure and the availability of instructional materials; facility accessibility, encompassing students' practical access to classrooms, laboratories, libraries and information and communication technology facilities; and academic performance, understood as the downstream outcome shaped jointly by the quality of the preceding two conditions. This three-level analytical structure allows the study to trace participatory budgeting's contribution to academic performance not merely as a direct, unexplained association but as an outcome substantially mediated by its more immediate effects on the physical and material conditions of teaching and learning.

4. Empirical Review

A body of Nigerian and comparable international empirical work has examined the relationship between participatory governance mechanisms, school infrastructure and facility conditions, and academic performance, providing a foundation against which the present study's findings can be situated.

Ekpenyong (2023), examining school infrastructure and students' academic performance in Nigeria, found that schools with adequate classrooms, libraries and laboratories recorded significantly higher levels of student participation and academic achievement than comparably staffed schools operating with inadequate facilities, and that interactive teaching methods combined with adequate learning materials significantly improved students' interest and participation in classroom activities, directly supporting the theorised link between facility conditions and academic outcomes underpinning the present study.

Ogunode (2023), examining challenges of educational financing and administration in Nigeria, found that many public secondary schools suffer from inadequate classrooms, overcrowding and poor infrastructure that directly restrict students' access to effective learning spaces, concluding that restricted facility access negatively affects student concentration and academic engagement, and that centralised budgeting practices in Nigerian education administration frequently result in misallocation of resources away from schools' most pressing infrastructural needs.

Madukwe, Okafor and Ugwuanyi (2024), examining the relationship between school environment and students' academic performance in secondary schools, found that improved school infrastructure significantly enhances students' interest in learning and classroom engagement, and that access to digital learning tools specifically enhances students' curiosity, participation and overall learning experience, while noting that limited information and communication technology infrastructure across many Nigerian schools continues to constrain the realisation of this particular benefit.

Ayeni and Bamire (2022), examining school-based management and academic performance in secondary schools in Owo Local Government Area, Ondo State, Nigeria, found that schools implementing genuine stakeholder participation in governance and resource decisions recorded measurably better academic performance outcomes than schools under more centralised administrative arrangements, with the improvement attributed substantially to more accurate school-level identification of infrastructural and material priorities under participatory governance, directly relevant to the present study's central hypothesis linking participatory budgeting to educational effectiveness.

Ishii and Ogawa (2024), examining school-based management's effect on learning achievement in Senegal's primary education system, found a positive association between structured stakeholder participation in school governance and measured learning outcomes, contingent on the depth and consistency of stakeholder involvement across planning cycles, offering comparable West African evidence for the theoretical mechanism underpinning the present study.

Olawale and Yusuf (2021), examining school facilities and students' academic achievement in public secondary schools in Nigeria, found that students with better access to learning resources, including textbooks, laboratories and libraries, consistently achieved higher academic results than students with limited facility access, and that community participation in educational planning was associated with

improved school facility development, providing direct empirical support for the facility accessibility dimension examined in the present study.

Collectively, these empirical studies converge on two consistent findings relevant to the Akwa Ibom State context: first, that the school learning environment and students' accessibility to teaching and learning facilities are strongly and consistently associated with academic performance across Nigerian and comparable West African public school settings; and second, that participatory governance mechanisms, including participatory budgeting and school-based management, are associated with measurable improvement in these facility and learning environment conditions, and, through them, with improved academic performance.

2.3 Summary of the Literature

The reviewed literature establishes the school learning environment and students' accessibility to teaching and learning facilities as conceptually well-defined and empirically validated determinants of academic performance within Nigerian and comparable West African public secondary education systems (Ekpenyong, 2023; Olawale & Yusuf, 2021). Conceptually, both constructs are understood to depend substantially on the quality of school-level budgeting and resource allocation decisions, with centralised, non-participatory budgeting practice repeatedly linked to persistent Nigerian school infrastructure deficits (Ogunode, 2023; Adeiza & Nurudeen, 2025). Theoretically, School-Based Management Theory situates participatory budgeting's contribution to academic performance as substantially mediated through its more immediate effects on the learning environment and facility accessibility, rather than as a direct, unexplained association.

Empirically, Nigerian and comparable West African studies converge on a consistent conclusion: participatory governance mechanisms, including participatory budgeting and school-based management, are associated with measurable improvement in school infrastructure, facility accessibility and academic performance, though this association depends on the depth and consistency of stakeholder involvement sustained over time (Ayeni & Bamire, 2022; Ishii & Ogawa, 2024). A clear gap nonetheless persists in the literature: while the general relationship between school infrastructure and academic performance is well established within Nigerian scholarship, comparatively few studies have directly examined participatory budgeting's specific contribution to this relationship within a Nigerian state ministry of education context, as distinct from individual school-based management committees operating with greater administrative autonomy. The present study addresses this gap through its focus on the Akwa Ibom State Ministry of Education and its public secondary school system.

3. Methodology

The study adopted a descriptive survey research design, appropriate for examining relationships among participatory budgeting, the learning environment, facility accessibility and academic performance as these variables naturally occur within Akwa Ibom State's public secondary school system, without manipulation of the variables under study. The study was conducted within the Akwa Ibom State Ministry of Education and a sample of its affiliated public secondary schools, located in Nigeria's South-South geopolitical zone.

The population of the study comprised stakeholders within the education sector under the Ministry, including Ministry officials, school administrators, teachers and senior secondary school students. A multi-stage sampling technique was employed, combining purposive sampling to select Ministry officials and school administrators, stratified sampling to categorise respondents into distinct stakeholder groups, and simple random sampling to select individual respondents within each group. A structured instrument, the Participatory Budgeting and Educational Effectiveness Questionnaire, was administered directly to respondents, with sections addressing respondent demographic information, participatory budgeting practice, the school learning environment, students' accessibility to teaching and learning facilities, and academic performance, each measured on a four-point Likert scale ranging from strongly agree to strongly disagree. Of two hundred and fifty questionnaires distributed, two hundred and thirty were properly completed and returned, representing a response rate of ninety-two per cent.

The instrument was subjected to face and content validation by experts in educational management and measurement and evaluation, with their corrections incorporated into the final instrument.

Instrument reliability was assessed through a pilot study administered to twenty respondents outside the main study area, with the resulting data analysed using Cronbach's Alpha; a reliability coefficient of 0.70 or above was adopted as the threshold for acceptability. Data collected were analysed using mean and standard deviation to answer the study's research questions, with a mean score of 2.50 or above interpreted as respondent agreement, while simple regression analysis was used to test the study's central hypothesis at the 0.05 level of significance, examining the relationship between participatory budgeting and overall educational effectiveness.

4. Findings and Discussion

This section presents the study's findings, organised around its research questions and hypothesis, and discusses them with reference to the literature reviewed above.

4.1 Participatory Budgeting and the Learning Environment

Respondents' mean ratings on items addressing participatory budgeting's contribution to the school learning environment yielded a grand mean of 3.08, indicating clear respondent agreement that participatory budgeting improves classroom conditions, school infrastructure and the availability of teaching materials. The item addressing the specific provision of teaching materials recorded the lowest mean within this set, at 3.00, suggesting that while participatory budgeting is perceived to benefit the learning environment broadly, instructional material provision may represent a comparatively less fully resolved dimension than infrastructural improvement more generally. This finding is consistent with Madukwe et al.'s (2024) finding that improved school infrastructure significantly enhances student engagement, and with Ogunode's (2023) finding that centralised budgeting practices contribute directly to Nigerian public school infrastructure deficits.

4.2 Participatory Budgeting and Accessibility to Teaching and Learning Facilities

On facility accessibility specifically, respondents recorded a grand mean of 3.04, again indicating clear agreement, though the lowest individual mean recorded across the entire study, at 2.95, was registered on the item addressing information and communication technology facility availability specifically. This pattern indicates that while participatory budgeting is associated with generally improved accessibility to classrooms, laboratories and libraries, digital and information and communication technology infrastructure represents a comparatively underserved dimension of facility accessibility even where participatory budgeting practice is in place, a pattern directly consistent with Ogunode's (2023) and Madukwe et al.'s (2024) findings that limited information and communication technology infrastructure continues to constrain Nigerian schools' realisation of technology-enabled learning benefits.

4.3 Participatory Budgeting and Academic Performance

Respondents recorded a grand mean of 3.11 on items addressing participatory budgeting's relationship to academic performance, the highest grand mean recorded across the three outcome dimensions examined in this study. Regression analysis testing the relationship between participatory budgeting and overall educational effectiveness yielded a correlation coefficient of 0.72 and a coefficient of determination of 0.52, indicating that participatory budgeting practice statistically explains approximately fifty-two per cent of the variance in respondents' perceived educational effectiveness, a result statistically significant at the 0.05 level. This finding is consistent with Ayeni and Bamire's (2022) finding that schools implementing genuine stakeholder participation in governance recorded measurably better academic performance outcomes, and with Ishii and Ogawa's (2024) comparable finding within Senegal's primary education system.

4.4 Discussion

Read through School-Based Management Theory, these findings indicate that participatory budgeting within the Akwa Ibom State Ministry of Education operates substantially through the mechanism the theory predicts, improving academic performance indirectly, by first improving the physical learning environment and facility accessibility conditions that existing Nigerian scholarship consistently identifies as immediate determinants of student engagement and achievement. The comparatively higher mean recorded on academic performance relative to the two facility-related dimensions

suggests that respondents perceive participatory budgeting's cumulative benefit for student outcomes as exceeding its more narrowly measured contribution to any single facility category in isolation, consistent with the theorised, mediated relationship between governance practice, facility conditions and academic outcomes.

The consistently lower means recorded specifically for instructional material provision and information and communication technology facility access, relative to the generally strong pattern of agreement recorded elsewhere in the study, indicate a specific and actionable gap within the Ministry's current participatory budgeting practice. This pattern is consistent with the broader Nigerian literature's finding that information and communication technology infrastructure represents a persistently underserved dimension of school facility provision even where broader governance and infrastructural improvements are underway (Ogunode, 2023; Madukwe et al., 2024), suggesting that the Ministry's continued participatory budgeting practice should direct particular, deliberate attention toward this specific facility category if the fuller academic performance benefits associated with digital-learning access are to be more completely realised.

5. Conclusion and Recommendations

This study examined the relationship between participatory budgeting, the learning environment, students' accessibility to teaching and learning facilities, and academic performance within public secondary schools under the Akwa Ibom State Ministry of Education, situating the empirical evidence within the conceptual, theoretical and prior empirical literature reviewed above. The study concludes that participatory budgeting is significantly and positively associated with improvements in the school learning environment, students' accessibility to teaching and learning facilities, and academic performance, with participatory budgeting practice statistically explaining a substantial share of the variance in perceived educational effectiveness, though the strength of this association is comparatively more modest for information and communication technology facility access specifically than for other facility categories examined.

Arising from these findings, the study recommends, first, that the Ministry prioritise facility improvement investment guided directly by stakeholder-identified need, sustaining the participatory needs-assessment approach associated with the learning environment and facility accessibility gains documented in this study; second, that particular, deliberate attention be directed toward closing the comparatively wider information and communication technology access gap identified in this study, given its distinct and currently underserved contribution to Nigerian students' overall facility accessibility (Madukwe et al., 2024); third, that participatory needs assessment be institutionalised as a standing, recurring feature of school-level budget planning, rather than an occasional or ad hoc consultative exercise, consistent with the sustained stakeholder involvement identified as necessary for lasting governance benefit in comparable West African evidence (Ishii & Ogawa, 2024); and fourth, that further research be undertaken to examine participatory budgeting's facility and academic performance effects using objective, independently verified infrastructural and academic performance data, complementing the self-reported perceptual evidence gathered in this study.

The study is limited by its reliance on self-reported perceptual survey data rather than independently verified infrastructural or academic performance records, and by its cross-sectional design, which captures respondent perceptions at a single point in time rather than tracking facility and academic outcomes across successive budget cycles. Future research should consider longitudinal designs incorporating objective facility audit and academic performance data, alongside comparative assessment across other Nigerian state education systems, to further test and extend the findings of this review.

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