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The Influence of Regional Insecurity and 'Sit-at-Home' Orders on the Coverage of Biology Curriculum in South-East Nigeria: A Mixed-Methods Research Study

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ABSTRAK

Ketidakamanan regional dan arahan untuk tetap di rumah yang berulang di Nigeria Tenggara telah mengganggu kegiatan sekolah dan mengancam implementasi kurikulum yang efektif. Studi ini meneliti dampaknya terhadap cakupan kurikulum Biologi, praktik pengajaran, dan kesiapan ujian siswa. Desain metode campuran konvergen diadopsi yang melibatkan 247 guru Biologi di lima negara bagian Nigeria Tenggara, dilengkapi dengan 20 wawancara dan 10 observasi kelas. Data kuantitatif dianalisis menggunakan statistik deskriptif dan inferensial, sedangkan data kualitatif dianalisis secara tematik. Temuan menunjukkan bahwa 78,5% guru hanya mencakup tidak lebih dari 60% kurikulum Biologi yang ditentukan, dengan tingkat cakupan rata-rata keseluruhan sebesar 54,2%. Terdapat korelasi negatif yang kuat antara frekuensi tetap di rumah dan cakupan kurikulum ($r = -0,72$, $p < 0,001$). Kegiatan praktikum laboratorium sangat terpengaruh, dengan sebagian besar guru melaporkan sesi praktikum yang minimal atau tidak ada sama sekali. Strategi adaptasi umum meliputi pemadatan pelajaran, pengajaran berbasis tugas, dan penggunaan WhatsApp untuk penyampaian konten. Studi ini menyimpulkan bahwa ketidakamanan yang terus-menerus secara signifikan melemahkan pendidikan Biologi dan merekomendasikan pembelajaran campuran, restrukturisasi kurikulum, dan inisiatif sekolah aman yang didukung komunitas untuk mempertahankan pembelajaran selama krisis.

Keyword: Kurikulum Biologi; Arahan Belajar di Rumah; Ketidakamanan Regional; Cakupan Kurikulum; Pembelajaran Campuran

ABSTRACT

Regional insecurity and recurring sit-at-home directives in South-East Nigeria have disrupted school activities and threatened effective curriculum implementation. This study examined their impact on Biology curriculum coverage, instructional practices, and students' examination preparedness. A convergent mixed-methods design was adopted involving 247 Biology teachers across five South-East states, complemented by 20 interviews and 10 classroom observations. Quantitative data were analyzed using descriptive and inferential statistics, while qualitative data were subjected to thematic analysis. Findings revealed that 78.5% of teachers covered no more than 60% of the prescribed Biology curriculum, with an overall mean coverage rate of 54.2%. A strong negative correlation existed between sit-at-home frequency and curriculum coverage ($r = -0.72$, $p < 0.001$). Practical laboratory activities were severely affected, with most teachers reporting minimal or no practical sessions. Common adaptation strategies included lesson compaction, assignment-based instruction, and the use of WhatsApp for content delivery. The study concludes that persistent insecurity significantly undermines Biology education and recommends blended learning, curriculum restructuring, and community-supported safe-school initiatives to sustain learning during crises.

Keyword: Biology Curriculum; Sit-At-Home Directives; Regional Insecurity; Curriculum Coverage; Blended Learning

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1. INTRODUCTION

Science education is widely recognized as a fundamental driver of socio-economic and technological development, particularly in developing countries where scientific literacy contributes to improvements in healthcare, agriculture, environmental sustainability, and industrial innovation. Among the core science subjects offered in Nigerian secondary schools, Biology occupies a strategic position because it provides the foundation for disciplines such as medicine, nursing, pharmacy, agriculture, biotechnology, microbiology, and environmental science (Rieckmann, 2017). Consequently, effective implementation of the Biology curriculum is essential for producing scientifically literate graduates capable of contributing to national development.

The senior secondary school Biology curriculum developed by the Nigerian Educational Research and Development Council (NERDC) is designed to promote progressive learning through a structured sequence of topics, laboratory activities, field observations, and continuous assessment (NERDC, 2018). The curriculum is expected to be completed within three academic terms each year, with approximately three to four instructional periods allocated weekly. In addition to classroom instruction, laboratory activities play a critical role in reinforcing theoretical concepts and developing students' scientific inquiry, observation, experimentation, and analytical skills (Federal Ministry of Education, 2021). Effective curriculum implementation therefore depends on regular school attendance, stable academic schedules, teacher preparedness, and adequate instructional resources.

However, since 2021, educational activities in South-East Nigeria have been increasingly disrupted by persistent insecurity and recurring sit-at-home directives. The region, comprising Abia, Anambra, Ebonyi, Enugu, and Imo States, has experienced growing socio-political unrest associated with separatist movements, violent incidents, kidnappings, and the enforcement of sit-at-home orders by non-state actors (International Crisis Group, 2022). Initially introduced as a protest mechanism linked to the detention of the leader of the Indigenous People of Biafra (IPOB), these directives have evolved into recurring disruptions affecting transportation, economic activities, healthcare services, and educational institutions (Ogunode & Chijindu, 2022).

Despite repeated condemnation by federal and state governments, compliance with sit-at-home directives remains widespread due to fear of violence, intimidation, and possible reprisals against non-compliant individuals (Bello et al., 2022). Consequently, many schools either suspend academic activities on designated days or experience substantial absenteeism among both teachers and students. In some cases, schools close pre-emptively in response to security threats or parental concerns regarding student safety (Ibor et al., 2024). These disruptions have significantly reduced instructional contact hours and altered the normal academic calendar across the region.

The effects of these disruptions are particularly severe for Biology education because of the subject's practical and sequential nature. Effective Biology instruction requires continuous engagement with interconnected concepts and a systematic progression from foundational to advanced topics (MBAEGBU et al., 2020). For example, understanding genetics, physiology, and evolution depends heavily on prior knowledge of cell structure and organization. Likewise, ecological studies frequently require field observations, specimen collection, and practical investigations that demand adequate time, planning, and mobility. Recurrent interruptions therefore undermine both the continuity and depth of learning.

Faced with shortened instructional periods, teachers often adopt coping mechanisms that may compromise curriculum integrity. Such measures include condensing lesson content, omitting practical activities, relying heavily on theoretical instruction, or covering topics at an accelerated pace without sufficient student engagement (Nwafor & Ugwu, 2022). These practices negatively affect students' conceptual understanding, practical competence, knowledge retention, and readiness for external examinations such as the West African Senior School Certificate Examination (WASSCE) and the National Examination Council (NECO) examinations. Previous studies have shown that inadequate curriculum coverage is associated with poor academic achievement, particularly in science subjects where practical skills are essential (Bichi et al., 2017).

Beyond academic consequences, prolonged exposure to insecurity and educational disruptions can also affect the psychological well-being of both teachers and students. Continuous uncertainty and instability may reduce students' motivation, concentration, self-efficacy, and emotional resilience (Ojukwu, 2017). Teachers likewise face stress associated with incomplete syllabi, examination pressures, and safety concerns. In environments characterized by persistent insecurity, instructional effectiveness may decline because of burnout, absenteeism, and reduced morale (UNICEF, 2022).

International evidence consistently demonstrates that conflict and instability negatively affect educational systems. Studies conducted in contexts affected by armed conflict, terrorism, civil unrest, and natural disasters report learning losses, increased dropout rates, reduced teacher effectiveness, and challenges in curriculum implementation (Winthrop & Matsui, 2019; Avanesian et al., 2022). However, much of the

existing literature focuses on situations involving physical destruction of schools or large-scale displacement. Comparatively little attention has been paid to contexts where educational facilities remain operational but learning activities are repeatedly interrupted by periodic shutdowns driven by fear and socio-political coercion.

The South-East Nigerian experience represents a distinctive form of educational disruption that may be described as a cumulative instructional deficit. Unlike conventional conflict situations characterized by continuous school closure, sit-at-home directives create intermittent yet recurring interruptions that gradually erode instructional time and hinder curriculum delivery. The unpredictability of these disruptions complicates lesson planning, assessment scheduling, practical organization, and academic monitoring. Over time, the cumulative instructional hours lost may equal or exceed those observed in more overt conflict situations. Despite the growing significance of this issue, empirical studies examining the specific effects of sit-at-home directives on science curriculum implementation remain limited. Existing research has focused primarily on economic consequences, political implications, human rights concerns, and general attendance patterns, with relatively little attention given to subject-specific curriculum outcomes and pedagogical adaptations (Bello et al., 2022).

Against this background, the present study investigates the effects of regional insecurity and sit-at-home directives on Biology curriculum coverage in secondary schools across South-East Nigeria using a mixed-methods approach. Specifically, the study examines the extent of curriculum completion, the instructional strategies adopted by Biology teachers to cope with recurring disruptions, the relationship between the frequency of sit-at-home days and curriculum coverage, and the perceived effects of these disruptions on students' psychological readiness for external examinations. The study is guided by two hypotheses: (1) there is no significant relationship between the monthly frequency of sit-at-home directives and Biology curriculum coverage rates, and (2) there is no significant difference in curriculum coverage between urban and rural schools operating under insecurity conditions. By integrating quantitative evidence with qualitative insights from teachers and school administrators, the study seeks to provide a comprehensive understanding of how insecurity affects Biology education and to generate evidence that can inform crisis-responsive educational policies, curriculum adaptation strategies, and sustainable science education practices in unstable learning environments.

2. RESEARCH METHOD

A. Research Design

This study adopted a convergent mixed-methods design (Creswell & Plano Clark, 2017), integrating quantitative and qualitative approaches to provide a comprehensive understanding of the impact of regional insecurity and sit-at-home directives on Biology curriculum implementation. Quantitative data were used to assess curriculum coverage and relationships among key variables, while qualitative data provided contextual explanations of teachers' instructional experiences and adaptations.

B. Study Area

The study was conducted in the five states of South-East Nigeria: Abia, Anambra, Ebonyi, Enugu, and Imo. These states have experienced recurring sit-at-home directives and security-related disruptions since 2021, making them suitable contexts for investigating their effects on educational activities. Public secondary schools were selected because they represent the largest segment of formal secondary education in the region.

C. Population and Sample

The target population comprised 1,250 senior secondary school Biology teachers in public secondary schools across the five states. A multi-stage sampling procedure was employed. First, the states were stratified by geographical location, and Local Government Areas (LGAs) were randomly selected from each state. Eligible schools were then identified, and Biology teachers were randomly sampled. The final quantitative sample consisted of 247 teachers, representing an 82.3% response rate.

For the qualitative component, 20 Biology teachers were purposively selected to ensure variation in teaching experience and school location. Participants included teachers from urban, peri-urban, and rural schools.

D. Research Instruments

Quantitative data were collected using the Biology Instruction Disruption Scale (BIDS), a 32-item questionnaire consisting of four sections: demographic information, curriculum coverage, instructional adaptation strategies, and perceived student readiness for external examinations. Curriculum coverage was measured using percentage estimates, while instructional adaptations were assessed using a five-point Likert scale. The instrument was validated by three experts in science education and pilot-tested among 30 Biology teachers outside the study area, yielding a Cronbach's alpha coefficient of 0.89.

Qualitative data were obtained through semi-structured interviews and classroom observations. The interview protocol explored teachers' experiences with instructional disruptions, curriculum modification

practices, laboratory alternatives, and perceived student outcomes. Classroom observations documented instructional activities, time utilization, and teacher–student interactions.

E. Data Collection Procedure

Data were collected over an eight-week period between January and February 2024. Questionnaires were administered directly to participating teachers, while interviews were conducted with selected respondents. Classroom observations were carried out in operational schools to obtain complementary evidence regarding instructional practices during periods of disruption.

F. Data Analysis

Quantitative data were analyzed using SPSS version 26. Descriptive statistics, including means, standard deviations, and percentages, were used to summarize curriculum coverage and instructional adaptations. Pearson correlation analysis was employed to examine the relationship between the frequency of sit-at-home directives and curriculum coverage, while independent-samples t-tests compared curriculum coverage between urban and rural schools. One-way analysis of variance (ANOVA) was used to examine differences across states.

Qualitative interview data were transcribed verbatim and analyzed using the thematic analysis procedure proposed by Braun and Clarke (2006), involving data familiarization, coding, theme development, and theme refinement. Findings from both strands were integrated during interpretation to provide a comprehensive explanation of the phenomenon under investigation.

G. Ethical Considerations

Participation in the study was voluntary, and informed consent was obtained from all participants. To ensure confidentiality and participant safety, pseudonyms were used in place of personal identifiers, and sensitive information relating to specific schools and locations was excluded from the reporting of findings.

3. RESULTS AND DISCUSSION

A. Participant Characteristics

A total of 247 Biology teachers participated in the study. Male teachers constituted 61.5% of the sample, while the mean teaching experience was 9.3 years (SD = 4.7). Schools were distributed across urban (45%) and rural (55%) locations. Participants reported an average of 2.4 sit-at-home days per week during the preceding 12 months (SD = 0.9), representing approximately 38% of potential instructional days.

B. Curriculum Coverage

The overall mean Biology curriculum coverage for the 2022–2023 academic session was 54.2% (SD = 14.3). Only 8.9% of teachers reported covering at least 80% of the prescribed curriculum. Practical components, including microscopy, dissections, and enzyme experiments, recorded the lowest completion rate, with a mean practical coverage of 18.6% (SD = 22.1).

Table 1 presents curriculum coverage rates across terms and states. Coverage declined progressively from the first term (M = 61.4%, SD = 12.9) to the second term (M = 51.6%, SD = 14.9) and third term (M = 42.1%, SD = 17.7). Ebonyi State recorded the highest overall curriculum coverage (57.5%), whereas Anambra State reported the lowest (48.5%).

A repeated-measures ANOVA revealed a significant difference in curriculum coverage across the three academic terms, $F(2,492) = 87.4$, $p < 0.001$. Post-hoc Bonferroni analysis indicated that third-term coverage was significantly lower than first-term coverage ($p < 0.001$).

Table 1. Mean Percentage Curriculum Coverage by Term and State

State	First Term (%)	Second Term (%)	Third Term (%)	Overall (%)
Abia	62.3 (12.1)	51.4 (14.2)	41.2 (18.3)	51.6 (15.4)
Anambra	58.9 (13.4)	47.8 (15.6)	38.7 (17.9)	48.5 (16.2)
Ebonyi	66.2 (11.0)	58.1 (13.8)	48.3 (16.2)	57.5 (14.8)
Enugu	60.1 (12.7)	53.2 (14.5)	44.1 (17.1)	52.5 (15.9)
Imo	59.4 (13.0)	49.9 (15.1)	39.5 (18.0)	49.6 (16.1)
Total	61.4 (12.9)	51.6 (14.9)	42.1 (17.7)	54.2 (14.3)

Note: Values are presented as mean (SD).

C. Instructional Adaptations

Teachers reported several strategies to cope with recurring instructional disruptions. The most common adaptations were postponing topics to subsequent terms (61.5%), lesson compaction (54.3%), and sharing instructional materials through WhatsApp (41.3%). Assignment-based instruction was also frequently reported (33.6%), while only a small proportion of teachers utilized online synchronous teaching methods.

Table 2. Adaptive Instructional Strategies Adopted by Teachers (n = 247)

Strategy	Percentage (%)
Postponing topics to the next term	61.5

Strategy	Percentage (%)
Lesson compaction	54.3
Sharing content via WhatsApp	41.3
Assigning notes without classroom teaching	33.6
Merging classes	27.9
Using YouTube videos as laboratory substitutes	19.0
Conducting practicals only during uninterrupted weeks	8.5

D. Relationship Between Sit-at-Home Frequency and Curriculum Coverage

Pearson correlation analysis revealed a strong negative relationship between the monthly frequency of sit-at-home directives and curriculum coverage ($r = -0.72$, $p < 0.001$). Consequently, the first null hypothesis was rejected, indicating that increased disruption was associated with lower curriculum completion.

An independent-samples t-test further demonstrated a significant difference in curriculum coverage between urban and rural schools, $t(245) = 4.21$, $p < 0.001$. Urban schools reported higher mean coverage ($M = 58.3\%$, $SD = 13.1$) than rural schools ($M = 50.7\%$, $SD = 14.9$). Therefore, the second null hypothesis was also rejected.

E. Qualitative Findings

Thematic analysis generated three major themes describing teachers' experiences during periods of insecurity and recurring sit-at-home directives.

1) Theme 1: Teaching Against the Clock

Participants reported substantial pressure to complete the curriculum within limited instructional time. As a result, many teachers shifted from inquiry-based instruction to note-based teaching and accelerated lesson delivery. Classroom observations supported these accounts, showing that eight of the ten observed lessons involved teacher-centered instruction with minimal student participation.

2) Theme 2: Laboratory Activities as a Lost Opportunity

Teachers consistently identified practical activities as the most severely affected component of the Biology curriculum. Laboratory equipment remained underutilized, and many scheduled practical sessions were repeatedly cancelled due to school closures. Although some teachers attempted to introduce virtual laboratory resources, poor internet connectivity and limited student access to digital devices restricted their effectiveness.

3) Theme 3: Psychological Erosion and Examination Fatalism

Participants reported declining student motivation, increasing academic pessimism, and reduced confidence regarding external examinations. Approximately 74% of teachers rated students' psychological readiness for WASSCE Biology examinations as very poor. Teachers similarly described experiencing stress, emotional exhaustion, and professional burnout resulting from prolonged uncertainty and repeated disruptions.

F. Discussion

This study provides empirical evidence that recurring sit-at-home directives and regional insecurity have significantly disrupted Biology curriculum implementation in South-East Nigeria. The overall curriculum coverage rate of 54.2% is substantially below the 75% minimum completion benchmark recommended by the Nigerian Educational Research and Development Council (NERDC, 2018). The progressive decline in coverage across academic terms further suggests that the cumulative effects of instructional disruptions become more pronounced over time, reducing opportunities for meaningful learning and curriculum completion.

The findings are particularly concerning given the sequential nature of Biology education. Many Biology concepts are hierarchically structured, meaning that inadequate coverage of foundational topics may hinder students' understanding of more advanced concepts (MBAEGBU et al., 2020). The significant reduction in third-term coverage indicates that prolonged disruptions not only reduce instructional time but also weaken curriculum continuity. These findings are consistent with previous studies conducted in conflict-affected educational settings, which reported substantial learning losses and reduced curriculum implementation effectiveness (Bertoni et al., 2019; UNICEF, 2020).

Another important finding relates to the severe decline in practical instruction. Laboratory activities recorded the lowest level of implementation, with only 18.6% of scheduled practical sessions completed. Since practical experiences constitute a central component of Biology education, their absence limits students' opportunities to develop scientific inquiry, observation, and experimental skills. The widespread use of note-based practical instruction observed in this study suggests that many students are being exposed to scientific procedures theoretically rather than experientially, potentially weakening both conceptual understanding and examination preparedness.

The strong negative relationship between the frequency of sit-at-home directives and curriculum coverage ($r = -0.72$) demonstrates that recurring disruptions directly undermine instructional effectiveness. Furthermore, the significantly lower curriculum coverage recorded in rural schools highlights existing educational inequalities. Rural schools often face additional challenges, including transportation difficulties,

limited security presence, and reduced access to alternative learning resources, making them more vulnerable to instructional interruptions.

Teachers' adaptive strategies, including lesson compaction, assignment-based instruction, and the use of WhatsApp for content delivery, demonstrate efforts to sustain learning under challenging circumstances. However, these strategies raise important pedagogical concerns. Lesson compaction may reduce opportunities for discussion, reflection, and conceptual clarification, while digital alternatives assume reliable internet connectivity and student access to mobile devices. Consequently, emergency instructional adaptations may unintentionally widen existing educational disparities, particularly among students from disadvantaged backgrounds.

Qualitative findings further revealed substantial psychological consequences for both teachers and students. Reports of academic hopelessness, declining motivation, burnout, and examination anxiety support earlier studies linking prolonged educational disruption with reduced academic self-efficacy and student engagement (Ojukwu, 2017). These findings suggest that the effects of insecurity extend beyond curriculum coverage and may influence long-term educational aspirations, including students' willingness to pursue STEM-related careers.

The findings have important policy implications. Educational authorities should develop crisis-responsive instructional frameworks that combine flexible curriculum delivery with alternative learning modalities. Blended learning approaches, modular instructional materials, community-supported safe-school initiatives, and targeted psychosocial support for teachers and students may help reduce learning losses during periods of instability. In addition, curriculum planners should consider developing minimum competency frameworks that prioritize essential Biology concepts when normal instructional schedules cannot be maintained.

This study is subject to certain limitations. Curriculum coverage data were based primarily on teacher self-reports and may therefore be influenced by reporting bias. In addition, the cross-sectional design limits causal interpretation of the observed relationships. Future studies should incorporate longitudinal designs and objective indicators of student achievement, including external examination performance, to provide a more comprehensive understanding of the long-term educational consequences of insecurity and recurring school disruptions.

4. CONCLUSION

This study examined the effects of regional insecurity and recurring sit-at-home directives on Biology curriculum implementation in South-East Nigeria. The findings revealed that curriculum coverage was substantially reduced, with an average completion rate of only 54.2%, while practical laboratory activities experienced severe disruption. A strong negative relationship was found between the frequency of sit-at-home directives and curriculum coverage, indicating that repeated instructional interruptions significantly hinder effective curriculum delivery. The study also identified disparities between urban and rural schools, with rural schools experiencing greater challenges in maintaining instructional continuity.

Although teachers adopted various coping strategies, including lesson compaction and digital content sharing, these measures were insufficient to fully mitigate the educational consequences of prolonged disruptions. Beyond curriculum loss, the findings suggest adverse effects on students' examination preparedness and the overall quality of science learning.

The study concludes that recurring insecurity poses a significant threat to Biology education and may undermine the development of future STEM capacity in the region. Therefore, educational stakeholders should prioritize crisis-responsive strategies, including flexible curriculum frameworks, blended learning approaches, safe-school initiatives, and targeted psychosocial support to ensure continuity of learning in unstable educational environments.

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