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Relational factors influencing teacher coverage of senior high school mathematics syllabus in Savannah Region of Ghana

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ABSTRACT

The study investigated factors affecting the coverage of the Senior High School Mathematics Syllabus in Ghana's Savanna Region, emphasizing the syllabus's role as a critical educational tool that outlines responsibilities, content, student expectations, and assessment methods. Using a descriptive survey design, the study sampled 96 mathematics teachers (76 male, 20 female) from five Senior High/Technical Schools, along with head teachers overseeing academics. Data revealed that only 60.4% of the mathematics syllabus was covered in the region. Key factors contributing to incomplete coverage included teacher competency, teaching methods, time management, attitudes of teachers and students, and availability of resources. Through factor analysis, 19 variables were reduced to seven key factors: teacher and student interest, institutional factors, teacher attitudes, pedagogical approaches, resource availability, time constraints, and unfavorable classroom conditions. Further analysis highlighted specific issues, such as teacher absenteeism, students' lack of interest in mathematics, student laziness, and weak foundational knowledge in mathematics, as significant barriers to syllabus coverage. The study concluded that these relational factors significantly hinder effective syllabus completion. To address these challenges, it is recommended that educational stakeholders in the Savanna Region take proactive measures to reduce teacher absenteeism, enhance student engagement, and improve foundational mathematics skills. By tackling these issues, stakeholders can improve syllabus coverage, ensuring better educational outcomes for students in the region.

Keywords: Ghana, Mathematics syllabus, Relational factors, Senior High School (SHS), Teacher coverage

1. INTRODUCTION

Mathematics is a fundamental subject in senior high school education, equipping students with essential skills in numbers, quantities, and measurement. It also fosters logical and rigorous thinking. A systematic approach to learning mathematics, governed by a well-structured curriculum, is essential for effective education (Matejka & Kurke, 1994). A syllabus, as defined by Thompson (2021), serves as a detailed plan outlining what students should learn in a particular subject. It not only imparts knowledge but also helps students meet their educational expectations, acting as a foundational document for assignments, readings, and activities.

Moreover, a well-structured course syllabus serves several purposes, as outlined by Richmond et al. (2022). It sets the tone for a course, motivates students to reach their academic goals, assists faculty in planning, structures students' work, and acts as a contract between faculty and students, outlining expectations. Osei and Mensah (2023) underline the importance of a comprehensive syllabus in preventing misunderstandings related to course objectives, assessment standards, grading policies, and other course components. A clear syllabus enhances information processing and supports student performance (Amoako & Koomson, 2024).

Despite ongoing efforts to improve mathematics and science education in Ghanaian senior high schools, student performance in mathematics continues to decline (Yarkwah & Gbormittah, 2020). External factors, such as the controversy over students' hair grooming policies (Navei, 2025) and a shortage of qualified teachers (Pokuah et al., 2023), disrupt the academic environment, further hindering effective learning. Previous studies have predominantly focused on factors outside the classroom, such as teacher training and students' attitudes toward mathematics (Ampadu, 2021). These studies have identified various factors contributing to poor math performance, such as inadequate teaching materials, inappropriate teaching methods, and the non-coverage of the syllabus before exams (Agyeman & Boateng, 2022; Enu et al., 2023; Salifu et al., 2021; Yahya et al., 2020). However, limited research has been conducted to understand the factors influencing the ability of SHS teachers to comprehensively cover the mathematics syllabus, particularly in the Savannah

Region of Ghana. Therefore, this study seeks to investigate the relational factors influencing teacher coverage of the SHS mathematics syllabus in the Savannah Region of Ghana, aiming to identify these factors and propose solutions to enhance math education and improve the academic performance of students in Ghana.

The study's significance lies in its contribution to addressing issues related to mathematics curriculum coverage in senior high schools, offering valuable insights for researchers, educators, and students to enhance teaching and learning. It emphasizes the need for capacity building among educators and contributes to academic literature, bridging research gaps. The research, conducted in the Savannah Region of Ghana, assesses the factors impacting the coverage of the senior high school mathematics syllabus, thereby providing insights with potential applicability beyond the region. Limitations, including the exclusive focus on public schools and resource constraints, were acknowledged, but the study optimized available resources to provide valuable insights within its defined scope.

1.1. Research objectives and questions

The principal objective of the research was to identify and understand the relational factors influencing the coverage of the core mathematics syllabus in Senior High Schools within the Savannah Region of Ghana. In order to address this objective, the study attempts to answer the following research questions:

1. RQ_1: *To what extent is the core mathematics syllabus covered by teachers in the Savannah region of Ghana?*
2. RQ_2: *To what extent do Senior High School mathematics teachers concur with factors that restrict their coverage of mathematics content?*
3. RQ_3: *What is the relationship between the coverage of the core mathematics syllabus and the academic performance of students in the West Africa Senior School Certificate Examination (WASSCE) in the Savannah Region?*

2. LITERATURE REVIEW: A Descriptive Literature Review (DLR) Approach

This study adopts a Descriptive Literature Review (DLR) approach to synthesize and interpret a wide body of empirical research related to mathematics syllabus coverage, student performance, teacher effectiveness, and curriculum implementation in West African secondary education. As emphasized by Bandara et al. (2023), DLR enables the mapping of current knowledge, identification of thematic patterns, and integration of scholarly insights with primary research data. The literature review is organized thematically to provide clarity on the structural, pedagogical, and systemic factors influencing mathematics teaching and learning outcomes.

2.1. Mathematics Performance Trends in West Africa

Mathematics achievement in West African secondary schools remains a persistent challenge. In Kaduna State, Nigeria, data from 2016–2020 showed that student performance in mathematics in West African Senior School Certificate Examinations remained low, with mean scores indicating underachievement despite interventions (Abdullahi et al., 2024). In Ghana, analysis of WASSCE performance over a decade indicated inconsistent results, with no clear trajectory of improvement (Abreh et al., 2018). Similarly, in Cameroon, student performance in mathematics showed rural-urban inequalities, with tangible school-related factors explaining up to 65% of the learning gap (Ngwafu & Tchamyou, 2023). Factors contributing to these trends include curriculum overload, time constraints, inadequate teacher training, and lack of instructional resources. In many cases, schools attempt to bridge coverage gaps by offering extra lessons outside regular hours, an approach that is not uniformly feasible across institutions.

2.2. Factors Influencing Syllabus Coverage and Student Achievement

Incomplete syllabus coverage is directly linked to poor examination performance. Several studies across Ghana and Kenya found that many SHS teachers cover only 50–75% of the mathematics syllabus prior to national exams (Nchor et al., 2023). This limited coverage hinders students' ability to master the full scope of examinable material and contributes to their poor performance. Time pressure, student and teacher absenteeism, and rigid academic calendars constrain teachers' ability to pace instruction effectively. Over-reliance on teacher-centered methods and the slow adoption of technology-enhanced learning approaches further limit instructional effectiveness (Moila, 2024; Sunzuma et al., 2023). Teachers also report difficulties in interpreting revised syllabi, particularly when new competency-based or constructivist elements are introduced without sufficient professional training (Højgaard, 2021). School characteristics such as type (boarding vs. day), ownership, and location significantly influence academic outcomes. Boarding schools, for instance, often demonstrate better performance outcomes due to structured learning environments and extended instructional time (Oladipo et al., 2025).

The completion of school syllabi is strongly influenced by instructional time, class size, and teaching methods. A well-organized academic calendar, as emphasized by the South African Department of Basic Education (2024), supports timely curriculum delivery, but large class sizes and overcrowding remain significant barriers (Bonney & Koomson, 2024). Additionally, the predominance of teacher-centred methods and rote learning in Ghanaian classrooms undermines

conceptual understanding and slows curriculum progression (Danquah, n.d.; Mereku, 2013). Instructional strategies that foster active learning and student engagement are essential for effective teaching and timely syllabus coverage.

Equally important are teacher qualifications, experience, and access to professional development. Studies have shown that certified and experienced teachers positively impact student achievement, although the benefits of experience tend to plateau after a few years (Quansah et al., 2024; Ababio & Dumba, 2014). The quality of teacher educators and ongoing training are crucial to maintaining effective teaching practices (Adu-Gyamfi et al., 2024; Oketch, 2014). Moreover, curriculum design and reform efforts, such as Ghana's educational restructuring from the 6-4-5-2 to the 6-3-3 educational structure, have introduced more demanding academic expectations. However, these reforms often outpace resource availability and teacher preparedness, leading to a gap between intended outcomes and actual classroom practice (Danquah, n.d.). Access to adequate learning resources remains a key factor in both student performance and comprehensive syllabus delivery (Ministry of Education, Ghana, 2024).

Teacher preparedness - encompassing academic training, teaching practice, and emotional readiness - is a crucial determinant of instructional effectiveness. Studies show that teachers who receive comprehensive preparation, including methods coursework and teaching practicums, report higher self-efficacy and are more likely to remain in the profession (Golubtchik, 2024; Kapadia Matsko et al., 2018; note: supplemented). Emotional preparedness also enhances teacher resilience and adaptability, particularly for novice teachers navigating complex classroom dynamics (Li et al., 2024). Preparedness significantly boosts teacher self-confidence, which correlates with organizational commitment and student achievement. In Rwanda, for instance, it was estimated that up to 26.2% of students' mathematics performance variance could be attributed to teacher preparedness levels (Journal of Education, 2022). Furthermore, early-career teachers who feel well-prepared are more likely to implement diverse teaching strategies, adapt to learner needs, and engage constructively with curricular expectations (Pan, 2023; Elyashiv et al., 2024).

Institutional support mechanisms, such as mentoring, peer networks, leadership involvement, and access to professional development, are equally important for fostering effective teaching. Teachers with strong institutional backing report lower levels of burnout, greater job satisfaction, and higher retention rates (Keese et al., 2022; Plessis et al., 2020). Supportive school environments enhance teachers' ability to adopt new technologies and pedagogical innovations, even though individual factors like motivation and role identity also play a role (Fira et al., 2024). Leadership and socialization opportunities contribute to the formation of a robust professional identity, although institutional support may not fully moderate this process. Still, a combination of emotional preparedness and strong institutional backing significantly enhances teachers' resilience and instructional quality (Umm E Farwa et al., 2024).

Gender-based performance disparities in mathematics vary across contexts. Some studies in Ghana found that girls outperformed boys in selected single-sex schools (Banson et al., 2023), while others attributed male dominance in mathematics to cultural expectations, normalized heteropatriarchal ideologies, and gender-role socialization (Tseer et al., 2025). These findings call for a critical look at educational policies and classroom practices that either reinforce or help dismantle such disparities.

2.3. WAEC Assessment Practices and Curriculum Implementation

The West African Examinations Council (WAEC) plays a central role in shaping curriculum implementation through its high-stakes assessments. WAEC assessments are grounded in a curriculum historically influenced by British standards and emphasize rote learning and procedural knowledge over applied skills (Ogunleye & Omolayo, 2025). While WAEC exams are often more difficult and discriminating than comparable tests like NABTEB (Ayanwale, 2023), the alignment between curriculum content and what is assessed remains problematic. This misalignment often leads to "teaching to the test," narrowing the curriculum and limiting opportunities for critical thinking or entrepreneurship development (Pak et al., 2020; Mereku, 2013). Moreover, public perceptions of WAEC's credibility heavily influence curriculum reform priorities and resource allocation. As WAEC assessments prioritize standardized outcomes, teachers often feel pressured to complete content at the expense of deeper understanding, especially under rigid timelines and with limited support (Clayback et al., 2022).

The literature reveals that mathematics performance and syllabus coverage in West African secondary schools are shaped by a confluence of structural, pedagogical, and contextual factors. Key among these are teacher preparedness, institutional support, curriculum complexity, and the powerful influence of assessment bodies like WAEC. Addressing these challenges requires targeted efforts to reform teacher education, align curriculum with assessment, and enhance in-service support mechanisms. These insights not only informed the design of the present study's instruments but also guided the interpretation of findings, particularly around teacher-related and systemic factors affecting curriculum implementation.

3. RESEARCH METHOD

This study adopted a mixed-method design, incorporating a descriptive survey approach alongside a Descriptive Literature Review (DLR) methodology. This combination allowed for the collection of empirical data from the field while also grounding the study in the broader body of scholarly literature. Together, these methods provided a comprehensive

understanding of the factors influencing mathematics syllabus coverage in senior high schools (SHSs) within Ghana's Savannah Region.

3.1 Descriptive Survey Design

The study adopted a descriptive survey design, which is widely recognized for its ability to gather quantitative data on current practices, attitudes, and conditions in natural settings. This design is appropriate when the objective is to describe characteristics of a specific population, identify relationships among variables, and inform decision-making in educational contexts (Creswell & Creswell, 2018; Fraenkel, Wallen, & Hyun, 2019). Descriptive surveys are especially suitable for education research as they enable the collection of standardized data from a large number of respondents, which can then be used to identify trends and inform policy and practice. This makes it an ideal choice for studying the relational factors that influence syllabus coverage among SHS mathematics teachers.

3.2 Study Population

The target population consisted of mathematics teachers in all 13 public SHS and technical schools in the Savannah Region. The accessible population comprised 126 mathematics teachers employed in these schools at the time of the study. From this pool, 96 participants were selected through purposive sampling, with selection based on the persistent underperformance of students in mathematics, particularly in schools where teachers were directly responsible for preparing candidates for the WASSCE examinations. The study applied clear inclusion and exclusion criteria. Teachers were included if they:

- **i.** *were currently teaching mathematics at the SHS level,*
- **ii.** *had taught for at least one academic year in their current school, and*
- **iii.** *were actively involved in WASSCE preparation.*

Teachers were excluded if they were newly posted (less than one term), on leave, or not directly responsible for mathematics instruction.

3.3 Data Collection and Instrumentation

Two main sources of data were utilized. First, a structured questionnaire was administered to gather data on teacher demographics, syllabus coverage, and relational factors such as institutional support, workload, and training. The instrument consisted of three main sections:

- **i.** Section A: Demographic information.
- **ii.** Section B: Level of syllabus coverag.
- **iii.** Section C: Influencing factors (relational, logistical, pedagogical)

The questionnaire was piloted with 15 mathematics teachers from a comparable region. The reliability of the instrument, measured using Cronbach's alpha, was found to be 0.60, indicating moderate internal consistency suitable for exploratory studies. Content validity was ensured through expert review and alignment with the literature on syllabus coverage and teacher performance. The second source of data was secondary performance records obtained from the West African Examinations Council (WAEC). These included recent WASSCE mathematics results from the sampled schools, which served as objective measures of educational outcomes.

3.4 Data Analysis

Quantitative data from the questionnaire were analyzed using IBM SPSS (v26) and Origin Pro 18. Descriptive statistics (means, standard deviations, frequency distributions) were used to summarize the responses. In addition, Exploratory Factor Analysis (EFA) was performed to group relational variables affecting syllabus coverage. This included the application of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity, followed by principal component extraction and Varimax rotation.

3.5 Descriptive Literature Review (DLR) Methodology

In addition to field data, the study employed a Descriptive Literature Review (DLR) approach to strengthen its theoretical foundation and interpretive depth. The DLR focuses on summarizing and synthesizing prior studies to identify trends, patterns, contradictions, and knowledge gaps related to the topic under investigation (Bandara et al., 2023). The DLR was chosen because of its suitability in mapping the existing body of knowledge on a topic, particularly in social science and education contexts. It provides a systematic but flexible method of linking current research findings to previous studies. As this study examines teacher practices, curriculum coverage, and educational outcomes, the DLR served to both inform the design of the questionnaire and guide the interpretation of empirical results. The review focused on four core thematic areas:

- ***i.*** *Trends in mathematics performance in West African secondary education.*
- ***ii.*** *Barriers to effective syllabus coverage in mathematics instruction.*

iii. *The influence of teacher preparedness and institutional support.*
iv. *WAEC assessment practices and implications for curriculum implementation*

3.6 Search Strategy and Inclusion Criteria

Sources were retrieved from academic databases such as ERIC, JSTOR, Google Scholar, and ResearchGate using search terms including: "mathematics performance in Ghana", "syllabus coverage SHS", "WAEC mathematics factors", and "teacher effectiveness in West Africa". Only peer-reviewed journal articles, government policy documents, and WAEC reports published within the last 10 years were considered. Priority was given to studies situated in sub-Saharan Africa, particularly Ghana, to ensure relevance to the study context.

3.7 Synthesis and Integration

Findings were organized under recurring themes such as teacher qualifications, curriculum challenges, assessment pressures, and instructional resource availability. These insights directly informed the structure and content of Sections B and C of the questionnaire. For instance, the documented impact of teacher workload and in-service training (Kofie et al., 2019) helped formulate items that captured these relational dynamics in the field study. The literature review also helped triangulate results from the questionnaire and WAEC data, enabling the researchers to draw nuanced conclusions about how theoretical challenges manifest in practice.

3.8 Ethical Considerations

Ethical protocols were strictly followed throughout the research process. Participants provided informed consent, and participation was entirely voluntary. Anonymity and confidentiality were assured, and no identifying data were published. Ethical clearance was obtained from the researcher's affiliated institution prior to fieldwork. All secondary sources were critically evaluated and properly cited to uphold academic integrity.

4. DATA ANALYSIS

4.1. Distribution of Characteristics of Study of Participants

The study employed a total of 96 mathematics tutors from five senior high/technical schools (SHS) in the Savannah region of Ghana. The majority of the participants were categorized as professionals, constituting 92.7% of the sample, while non-professionals accounted for 7.3%. The inclusion of five different schools, each contributing nearly 20% of the total sample, signifies a well-distributed representation within the study, encompassing Damongo SHS, Sawla SHS, Ndewura Jakpa SHS, Buipe SHS, and Buipe SHTS. The research was particularly focused on the mathematics department, comprising 100% of the participants, underscoring the exclusive emphasis on mathematics teachers within the study.

The study participants showcased varying levels of teaching experience, with the most substantial group possessing 4-7 years of experience (27.1%), followed by those with 8-11 years (15.6%). The educational qualifications were diverse, with the majority holding a first degree (69.8%) and a significant proportion possessing a second degree (30.2%). Notably, the majority specialized in mathematics (44.8%), followed by economics (21.6%) and accounting (18.8%). A significant imbalance in gender distribution was observed, with 79.2% of participants being male and 20.8% female. The age distribution revealed the prominence of individuals in their thirties, particularly in the 30-34 years age group (43.8%).

Table 1: List of Islamic Banking Institutions in Malaysia

Demographics	n (%)
Professional Status	
Professional	89 (92.7%)
Non-professional	7 (7.3%)
Name of School	
Damongo SHS	19 (19.8%)
Sawla SHS	20 (20.8%)
Ndewura Jakpa SHS	19 (19.8%)
Buipe SHS	19 (19.8%)
Buipe SHTS	19 (19.8%)
Department	
Mathematics	96 (100%)
How long have you been teaching?	
1-3 years	19 (19.8%)
4-7 years	26 (27.1%)
8-11 years	15 (15.6%)
12-15 years	22 (22.9%)
16 years and above	14 (14.6%)
Level of Education	
Certificate	0 (0.0%)
Diploma/HND	0 (0.0%)
First Degree	67 (69.8%)

Second Degree	29 (30.2%)
Area of Specialization	
Accounting	18 (18.8%)
Mathematics	43 (44.8%)
Economics	21 (21.6%)
Others	14 (14.6%)
Sex	
Male	76 (79.2%)
Female	20 (20.8%)
Age	
20-24 years	2 (2.1%)
25-29 years	15 (15.6%)
30-34 years	42 (43.8%)
35-39 years	17 (17.7%)
40-44 years	0 (0.0%)
45-50 years	18 (18.8%)
Above 50 years	2 (2.1%)
Total	**96 (100%)**

Source: Field Survey (2021)

4.2. RQ_1: To what extent is the core mathematics syllabus covered by teachers in the Savannah region of Ghana?

The In Figure 1, a substantial portion of participants, totalling 44.8%, revealed that mathematics teachers in the Savannah region cover approximately 70% of the core mathematics syllabus before students' final exams. This percentage is followed by 34.4% and 13.5% of participants who indicated syllabus coverage rates between 80-90% and about 60%, respectively. However, only 5.2% and 2.1% of participants reported syllabus coverage rates of 100% and less than 60%, respectively. These findings suggest that several topics within the syllabus remain undressed during the three-year Senior High School (SHS) education in the region, potentially impacting the academic performance of WASSCE candidates from the Savannah region.

Furthermore, when looking at mathematics teachers as a whole, approximately 60.4% of them in the Savannah region can successfully complete the entire syllabus when preparing their students for the WASSCE examination. This supports the findings of a previous study by Dennis, Mereku, and Alhassan in 2018, which indicated that teachers typically cover only about 62% of the mathematics syllabus meant for students to complete before their final exams. This incomplete syllabus (centered).

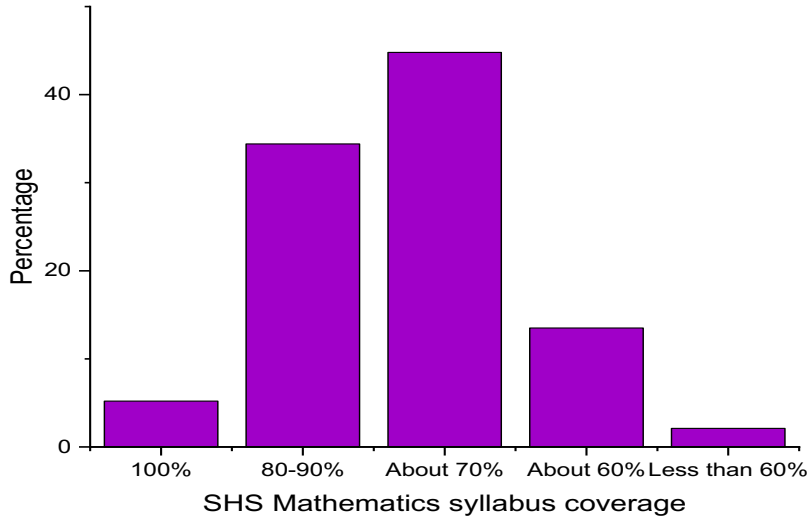

Figure 1: Percentage score of the extent of mathematics syllabus coverage by teachers

4.3. RQ_2: To what extent do Senior High School mathematics teachers concur with factors that restrict their coverage of mathematics content?

The results indicate that 89.6% (A+SA) of respondents agree that teachers possess sufficient knowledge of the mathematics syllabus, emphasizing its importance for effective teaching and learning, consistent with Asante and Asare (2023). Furthermore, 89% agree that teachers employ appropriate teaching methods for students to understand concepts rapidly, aligning with the findings of Mthethwa and Ndlovu (2025). More than half, 57% (A+SA) of respondents find the 3-year time frame adequate and 59% of teachers were satisfied with the distribution of mathematics periods on the school time table. This resonates with previous studies highlighting time constraints as a challenge in mathematics education (Nchor et al., 2023; Bonney et al., 2022). Effective time management strategies are crucial for prioritizing essential

mathematical concepts and skills while advocating for structural changes to ensure full syllabus coverage.

In terms of time management and factors that hinder syllabus coverage. The majority agree that spending excessive time on extracurricular activities (82%), teaching multiple classes (88%), lack of a clear yearly academic calendar or timetable (57%) and unrecovered loss time delays syllabus coverage (86%), as well as overstay of students on break hours (86%) limits timely and syllabus coverage. These findings are in alignment with some researchers (Mwangi & Ochieng, 2025; Ogunleye, 2020). The data accentuates the importance of efficient time management strategies, potentially involving reductions in extracurricular time allocation and the development of clear academic calendars or timetables.

Additionally, the study also discusses attitudinal factors that affect syllabus coverage. The study indicates that teacher absenteeism (83%), students' lack of interest (72%), laziness (67.9%), and poor foundational skills in mathematics (66%) are key issues. These findings emphasize the significance of addressing attitudinal factors to enhance syllabus coverage by improving teacher attendance, boosting student motivation, and reinforcing foundational skills. These align with previous research (Agyei & Agyei, 2021; Zan & Di Martino, 2020; Amoako & Koomson, 2025).

Moreover, respondents indicate that good school facilities and access to such facilities significantly influence coverage. These findings align with existing literature emphasizing the importance of adequate teaching and learning resources (Tian et al., 2020; Asante & Danso, 2024; Yusuf & Muhammad, 2023) in enhancing the quality of education. These resources, including ICT, can significantly improve the teaching and learning experience, though issues with the availability of textbooks and furniture need addressing. On the availability and adequacy of syllabus content and resources. While respondents indicate that the mathematics syllabus is available, concerns persist regarding textbooks and furniture. On the bright side, ICT resources are both available and considered adequate. The findings underscore the need to address shortages in textbooks and furniture while leveraging the potential of ICT resources to enhance mathematics education.

Table 2: Teacher's Competency, Time Management, and Syllabus Coverage

Statement	**SA**	**A**	**D**	**SD**	**U**
Teacher's Competency	%	%	%	%	%
1. I demonstrate enough knowledge on the content of the mathematics syllabus	43	47	6	1	3
2. The method I use in teaching is appropriate for fast and easy understanding of concepts by students	28	60	8	0	3
Adequacy of Time for Full Coverage of the Mathematics Syllabus	%	%	%	%	%
3. The 3-years' time period for completion of the SHS mathematics syllabus is enough	18	39	22	22	0
4. I am satisfied with the distribution of the mathematics periods on the school time table	14	45	27	14	1
Time Management and Syllabus Coverage	%	%	%	%	%
5. Spend too much time on extra-curricular activities which delays coverage of the syllabus	41	41	15	2	2
6. Teaching multiple classes delays coverage of the syllabus	34	54	7	2	2
7. Lack of a clear yearly academic calendar/time table limits timely coverage	30	27	32	6	4
8. Unrecovered loss time by teachers for late entry of class	33	47	13	13.5	4
9. Overstay of students on break hours hinders timely coverage	50	36	7	5	1
Attitudinal Factors Affecting Syllabus Coverage	%	%	%	%	%
10. Teacher absenteeism accounts for low coverage of the syllabus	44	39	12	6	0
11. Students lack interest in learning mathematics	12	49	26	14	0
12. Students show laziness towards learning mathematics	20	47.9	16	17	0
13. Mathematics is a difficult subject to deal with	9	16	22	53	0
14. Students lack concentration during mathematics lessons	7	30	42	21	0
15. My students have a poor foundation in mathematics	37	29	21	13	1
16. I often get to class late due to other things	13	30	31	25	1
Teacher Knowledge of Available Teaching/Learning Resources	%	%	%	%	%
17. Good and enough school facilities influence timely syllabus coverage	42	41	6	9	2
18. My school has facilities for teaching and learning mathematics	24	32	18	23	3
19. I have access to the available facilities in my school to facilitate my lesson delivery	17	31	39	12	2

Availability of resource for teaching and learning of mathematics	Available (%)	Enough (%)	Not Enough (%)
20. Mathematics Syllabus	39	41	21

21.	Textbooks	30	16	54
22.	Furniture	39	18	44
23.	ICT	62	23	16

Source: Field Survey (2021)

4.4. RQ_3: What is the relationship between the coverage of the core mathematics syllabus and the academic performance of students in the West Africa Senior School Certificate Examination (WASSCE) in the Savannah Region?

Table 3&4 presents the results of a correlation analysis conducted to assess the relationship between two variables namely: Coverage of core Mathematics Syllabus and the grade participant obtained in the core mathematics in West African Senior School Certificate Examination (WASSCE). From Table 4, it could be found that the result of the co-efficient of Pearson product moment between the two variables was 0.224.

Table 3: Statistics

Extent of syllabus coverage by mathematics teacher			WASSCE
N	Valid	250	586
	Missing	336	0
Mean		2.7200	7.0827
Median		3.0000	7.0000
Std. Deviation		.77718	.94101
Range		2.00	6.60
Minimum		2.00	2.40
Maximum		4.00	9.00

Source: Field Survey (2021)

Assessing the level of significance of the correlation between the variables, it was observed from the data that the correlation between the coverage of the core mathematics syllabus and WASSCE (0.000), which is less than 0.05. However, there was no significant correlation between the coverage of core mathematics and WASSCE core mathematics performance. It was evident that the coverage of the core mathematics syllabus could affect the academic performance in WASSCE. Bosson-Amedenu (2018), opined that the use of the WASSCE syllabus had a significant effect on the mathematical achievement of the candidates. Bosson-Amedenu study concluded that the use of the WASSCE syllabus is an effective tool for improving the mathematical achievement of WASSCE candidates. The finding affirmed that the use of the WASSCE syllabus has a positive effect on the mathematical achievement of WASSCE candidates in Ghana.

Table 4: Correlation between Coverage of Core Mathematics Syllabus and Grade Obtained in WASSCE

		Extent of syllabus coverage	What grade did you obtained in mathematics in WASSCE
Extent of syllabus coverage	*Pearson Correlation*	1	.224**
	Sig. (2-tailed)		.000
	N	250	250
What grade did you obtained in mathematics in WASSCE	*Pearson Correlation*	.224**	1
	Sig. (2-tailed)	.000	
		250	586

Source: Field Survey (2021)

5. FINDINGS AND DISCUSSION

5.1. Characteristics of Study Participants

The diverse profile of mathematics teachers in the Savannah Region of Ghana, drawn from five senior high/technical schools, provides a robust foundation for understanding syllabus coverage challenges. The predominance of professionally qualified teachers with first or second degrees, primarily in mathematics, suggests a strong baseline of subject expertise. However, the significant gender imbalance (favoring male teachers) and concentration of relatively early-career educators (most with 4–7 years of experience) highlight potential structural and systemic issues in teacher recruitment and retention, particularly for female educators in rural regions like Savannah. These demographic patterns align with findings from Asante et al. (2025), who note that gender disparities in Ghanaian STEM teaching may reflect cultural and institutional barriers, potentially limiting diverse pedagogical perspectives that could enhance curriculum delivery. The age distribution, skewed toward younger teachers, suggests a need for targeted professional development

to bolster their experience, as novice teachers often face challenges in managing classroom dynamics and syllabus pacing (Golubtchik, 2024).

5.2. RQ_1: Extent of Core Mathematics Syllabus Coverage in the Savannah Region

The findings indicate substantial challenges in achieving comprehensive coverage of the core mathematics syllabus in the Savannah Region, with significant implications for students' preparedness for the West Africa Senior School Certificate Examination (WASSCE). The partial coverage observed underscores systemic barriers, such as rigid academic calendars and resource constraints, which prevent teachers from addressing all required topics within the three-year SHS period. This aligns with Nchor et al. (2023), who found that incomplete syllabus coverage in Ghanaian SHS is a persistent issue, often exacerbated by institutional inefficiencies and external pressures like extracurricular demands. The limited coverage likely undermines students' ability to master critical mathematical concepts, particularly those emphasized in high-stakes assessments like the WASSCE. As Asante and Asare (2023) suggest, teachers' perceptions of curriculum feasibility play a pivotal role in implementation success. Addressing these gaps requires not only structural reforms, such as extended instructional time, but also professional development to enhance teachers' curriculum navigation skills, particularly in resource-constrained settings like the Savannah Region.

5.3. RQ_2: Factors Restricting Syllabus Coverage

The discussion of factors hindering syllabus coverage reveals a complex interplay of teacher competency, time management, attitudinal barriers, and resource availability. Teachers' strong subject knowledge and use of appropriate pedagogical methods, as supported by Mthethwa and Ndlovu (2025), are critical assets but insufficient without addressing systemic constraints. For instance, time management challenges stemming from extracurricular overload, multiple teaching responsibilities, and unclear academic calendars mirror findings from Bonney et al. (2022) and Danquah (2025), who highlight how institutional inefficiencies disrupt curriculum pacing in Ghanaian SHS. These structural issues suggest a need for policy interventions, such as streamlined timetables and reduced non-academic demands, to prioritize instructional time.

Attitudinal barriers, including teacher absenteeism and student disengagement, further complicate effective syllabus delivery. Agyei and Agyei (2021) and Amoako and Koomson (2025) emphasize that addressing student motivation and foundational skill gaps is essential for improving engagement with mathematics. The prevalence of teacher absenteeism, as noted by Asante et al. (2025), may reflect low morale or inadequate institutional support, pointing to the need for mentorship and professional development programs to foster resilience and commitment. Resource constraints, particularly shortages of textbooks and furniture, align with Bonney and Koomson (2024) and Asante and Danso (2024), who underscore the critical role of physical resources in facilitating effective teaching. While ICT resources are available, their underutilization, as highlighted by Yeboah and Ampadu (2024), represents a missed opportunity to enhance pedagogy and accelerate syllabus coverage. Interventions should focus on integrating ICT training into teacher development programs and addressing resource disparities to create conducive learning environments.

5.4. RQ_3: Relationship Between Syllabus Coverage and WASSCE Performance

The modest positive relationship between syllabus coverage and WASSCE performance in the Savannah Region suggests that while completing the syllabus is important, it is not the sole determinant of academic success. This finding aligns with Nchor et al. (2023), who reported a stronger correlation in similar contexts, but highlights that pedagogical quality and student engagement mediate the impact of coverage on outcomes. Asante and Danso (2024) argue that effective teaching strategies, aligned with WASSCE assessment objectives, are crucial for translating curriculum coverage into improved performance. The modest correlation observed here may reflect misalignments between the taught curriculum and WASSCE requirements, as noted by Ogunleye (2020), who points to "teaching to the test" practices that prioritize rote learning over conceptual understanding. Additionally, Quansah et al. (2024) suggest that teacher preparedness and classroom support systems play a significant role in enhancing student outcomes beyond mere syllabus completion. To maximize WASSCE performance, interventions should focus on aligning curriculum delivery with assessment demands, improving teacher training in student-centered pedagogies, and fostering supportive learning environments that address attitudinal barriers like student disinterest (Amoako & Koomson, 2025).

6. CONTRIBUTION OF THE STUDY

This study offers critical insights into the persistent issue of incomplete mathematics syllabus coverage in Ghanaian secondary education. By combining empirical data from mathematics teachers in the Savannah Region with a broad thematic review of West African educational literature, it deepens the understanding of how systemic, pedagogical, and institutional constraints shape educational outcomes. It fills a regional gap in literature and provides policymakers with evidence-based pathways to reform classroom practices, curriculum implementation, and resource allocation.

7. IMPLICATIONS OF THE STUDY

This study underscores the disconnect between curriculum objectives and classroom realities in West Africa, especially in under-resourced regions. The findings highlight the systemic nature of underperformance in mathematics, driven by poor planning, resource scarcity, attitudinal challenges, and exam-focused instruction. The WAEC's exam-centered structure, emphasizing standardized assessments (Ogunleye & Omolayo, 2025), reinforces rote learning at the expense of deep conceptual understanding, exacerbating the rush to finish the syllabus. The regional focus on the Savannah area provides a critical case study that reflects broader trends identified in Nigeria, Cameroon, and Kenya. It confirms that curriculum reform efforts often outpace teacher preparation and institutional capacity (Adu-Gyamfi et al., 2024; Quansah et al., 2024), leading to implementation gaps and inequitable learning outcomes.

8. CONCLUSION

This study investigated the relational factors affecting core mathematics syllabus coverage in Senior High Schools in Ghana's Savannah Region. Findings reveal that teachers cover approximately 70% of the syllabus, with only 5.2% achieving full coverage, primarily due to systemic barriers such as rigid academic calendars, shortages of resources like textbooks, and attitudinal challenges, including teacher absenteeism and student disengagement. A modest correlation ($r = 0.224$) between syllabus coverage and WASSCE performance indicates that pedagogical quality and teacher preparedness significantly influence academic outcomes.

The study highlights the need for systemic reforms, including optimized academic timetables, enhanced investment in instructional resources like ICT, and targeted professional development for teachers. By focusing on the Savannah Region, it addresses a regional research gap, offering actionable insights for educators and policymakers. Future studies should explore private schools and longitudinal effects to enhance generalizability. These findings highlight the critical need to align curriculum delivery with assessment demands to improve mathematics education in Ghana..

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