

Annual Evaluation Survey

of

Leaders in Teaching Programme, May 2024

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ACRONYMS AND ABBREVIATIONS

BECE	Basic Education Certificate Examination
CAMFED	Campaign for Female Education
CHASS	Conference of Heads of Assisted Secondary Schools
CoE	College of Education
FGDs	Focus Group Discussions
FOI	Fidelity of Implementation
GES	Ghana Education Service
GESI	Gender Equality, and Social Inclusion
GNPC	Ghana National Petroleum Commission
GTEC	Ghana Tertiary Education Commission
ICT	Information, Technology And Communication Tools
INSET	In-Service Education and Training
IQR	Interquartile Range
JHS	Junior High School
KIIs	Key Informant Interviews
KNUST	Kwame Nkrumah University of Science And Technology
LIT	Leaders in Teaching
MEL	Monitoring, Evaluation and Learning
NAB	National Accreditation Board
NaCCA	National Council For Curriculum And Assessment
NaSIA	National Schools Inspectorate Authority
NIST	National Implementation Support Team
NTC	National Teachers Council
NTCE	National Council for Tertiary Education
NTS	National Teachers Standards
OECD	Organisation for Economic Co-Operation And Development
PLC	Professional Learning Centers
PTA	Parent and Teacher Association
PTEI	Pre-Tertiary Educational Institution
RMT	Regional Monitoring Team
SEaIP	School Establishment And Inspection Policy
SEI	Secondary Education Institution
SEN	Special Education Needs
SETP	Secondary Education Transformation Programme
SHS	Senior High Schools
SHTS	Senior High Technical Schools
SIPs	School Improvement Plans
SIS	Self-Improvement Scheme
SLIM	School Licensing And Inspection Management
SLiP	School Licensing Policy

TIs	Technical Institutes
TLM	Teaching And Learning Materials
T-SHEL	Transforming Senior High School Education, Teaching and Learning
T-TEL	Transforming Teaching, Education & Learning
WASSCE	West African Senior High Certificate Examination

Summary of key findings

The Leaders in Teaching (LiT) Programme builds on the foundation laid by the two-year Transforming Senior High Education and Learning (T-SHEL) programme, which ended in January 2023, to achieve transformative change in Ghana’s secondary education system. LiT seeks to ensure that the new secondary education curriculum is understood and taught effectively across all schools, increasing the proportion of teachers meeting the National Teachers’ Standards and ensuring that young people who complete secondary education have proficiency in the 21st Century Skills and competency skills required to succeed in further studies, adult life, and the world of work.

This report is the third round of survey aimed at finding robust evidence that can inform policy and practice to drive improvements in Ghana’s secondary education institutions. The stakeholders interviewed for the survey are teacher, heads of schools and their assistants, students, board members, parents and community based opinion leaders including parents and alumni.

The key findings of the survey are presented below:

- The findings of the 2023 assessment indicated that 40.2 percent of students are approaching proficiency level or higher in reading literacy, compared with 41.2 percent in 2022. There was a decline in the share of students approaching proficiency or higher in mathematics literacy, from 21.9 percent in 2022 to 18.9 percent in 2023. However, for science, the results reveal a significant improvement in literacy¹, from 37.8 percent in 2022 to 49.7 percent in 2023. Regarding 21st century skills, there was a 7.9 percentage-point increase from the 2022 results.
- The factors accounting for the decline in student performance in mathematics literacy include an insufficient number of teachers in school, inadequate and lack of instructional resources, digital and information, technology and communication tools (ICT), and conducive study facilities like libraries, science labs, and computer labs. Other factors include perceived negative attitudes of students, poor teaching strategies, weak foundational knowledge from the basic level, parental neglect and lack of parent support.

¹ Differences are noted throughout the report if the level of significance is less than 0.05

- On the other hand, the contributory factors to the increase in student performance in science and 21st century skills were teachers' ability to adapt to technology and new teaching methods, the introduction of remedial sessions, enhanced monitoring and discipline by school management, making lessons as practical as feasible, and the use of professional learning communities (PLC) sessions for group work, presentations, and research.
- About 15.9 percent of teachers are motivated to remain in the teaching profession in 2023, compared with a proportion of 10.3 percent in 2022. However, no significant difference existed between 2022 and 2023 regarding teachers' willingness to remain in the teaching profession. The key drivers for the lack of teacher motivation are low remuneration and other conditions of service, and inadequate teaching and learning resources.
- About the same proportion of teachers in 2022 are satisfied with their current well-being in 2023. For both 2022 (82.5 percent) and 2023 (84 percent), 'character and virtue' criteria had the highest score. Teachers are least satisfied with 'Financial and Material Stability' and 'Happiness and Life Satisfaction'. The main reason teachers gave for the low scores was that the status of their finances had been impacted, which had also affected their happiness.
- There is a significant increase in teachers' self-reported resilience to shocks, from 81.6 percent in 2022 to 85.2 percent in 2023, despite the many challenges faced as teachers.
- Compared to 2022, a similar proportion of teachers (6 in 10 teachers) in 2023 deem their work dignifying and fulfilling. The predominant reason, however, is nonpecuniary: their work gives them a sense of purpose and they feel respected at their workplaces and by loved ones.
- Compared to the 2021 and 2022 surveys, all the teachers are now aware of National Teachers Standards (NTS) through the Professional Learning Centers (PLC) intervention in schools. Teachers confirmed that they had received copies of NTS handbooks.
- The results show a significant progression in the number of teachers demonstrating NTS in their lessons, from 2021 (3.3 percent) and 2022 (3.3 percent) to 2023 (15.2 percent).
- While none of the teachers demonstrated the satisfactory use of digital technology in the 2022 survey, about 7.7 percent of teachers demonstrated the use of digital technology in 2023.

- Almost twice the proportion of teachers in 2023 demonstrated Gender, equality and social inclusion (GESI) responsive pedagogies in their lessons compared with 2022.
- More than half of school leaders demonstrate an understanding of their roles and responsibilities.
- Almost half (49.0 percent) of secondary education institutions (SEIs) surveyed are ensuring an inclusive, gender-sensitive environment for staff and students, compared with 40.0 percent in 2022.
- There is a significant improvement in the proportion of SEIs providing students with links to tertiary institutions, from 19.0 percent in 2022 to 76.3 percent in 2023.
- Across the types of stakeholders, significant improvement was recorded by parents and board members who rated the quality of secondary education as 'excellent'.
- While the greatest share of parents, opinion leaders, alumni, and board members think that the quality of secondary education is 'good,' the greatest share of agencies, unions, civil society organisations (CSO), and teachers rate secondary education quality as 'fair'.
- There is a significant increase in the percentage of stakeholders who perceive that secondary schools are preparing students for further education and the world of work. The percentage of stakeholders who perceived this outcome rose from 39.8 percent in 2022 to 47.6 percent in 2023.

Summary of Indicators:

	Indicator	Survey (2021)	LiT Survey (2022)	LiT Survey (2023)
SEI Students	Percentage of secondary education students by grade who demonstrate subject knowledge and 21st century skills.	<p><i>Subject knowledge: reading literacy (33.2 percent of students are approaching proficiency and or above),</i></p> <p><i>Mathematics literacy (36.5 percent of students are approaching proficiency and or above),</i></p>	<p><i>Subject knowledge: reading literacy (41.2 percent of students are approaching proficiency and or above),</i></p> <p><i>Mathematics literacy (21.9 percent of students are approaching proficiency and or above),</i></p>	<p><i>Subject knowledge: reading literacy (40.2 percent of students are approaching proficiency and or above),</i></p> <p><i>Mathematics literacy (18.9 percent of students are approaching proficiency and or above),</i></p>

Indicator		Survey (2021)	LiT Survey (2022)	LiT Survey (2023)
		<p>Science literacy (31.2 percent of students are approaching proficiency and or above),</p> <p>21st century skills (17.1 percent are proficient and or above)</p>	<p>Science literacy (37.8 percent of students are approaching proficiency and or above)</p> <p>21st century skills (21.3 percent are proficient and or above)</p> <p>For detailed information, please see sections 3.3 through 3.8.</p>	<p>Science literacy (49.7 percent of students are approaching proficiency and or above)</p> <p>21st century skills (29.2 percent are proficient and or above)</p> <p>For detailed information, please see sections 3.3 through 3.8.</p>
Teacher Indicator	Percentage of teachers in secondary education institutions who are motivated and want to remain in the profession.	<p>Teachers who are motivated (9.6 percent)</p> <p>Teachers who want to remain in the teaching profession (42.1 percent)</p>	<p>Teachers who are motivated (10.3 percent)</p> <p>Teachers who want to remain in the teaching profession (46.5 percent)</p> <p>For detailed information, please see section 3.9.1.</p>	<p>Teachers who are motivated (15.9 percent)</p> <p>Teachers who want to remain in the teaching profession (46.7 percent)</p> <p>For detailed information, please see section 3.9.1.</p>
	Share of secondary school teachers reporting improvements in their own well-being	N/A	<p>Overall (66.2 percent)</p> <p>For detailed information, please see section 3.9.2.</p>	<p>Overall (69.0 percent)</p> <p>For detailed information, please see section 3.9.2.</p>
	Secondary school teachers own assessment of their resilience	N/A	<p>Overall (81.6 percent)</p> <p>For detailed information, please see section 3.9.3.</p>	<p>Overall (85.2 percent)</p> <p>For detailed information, please see section 3.9.3.</p>

Indicator	Survey (2021)	LiT Survey (2022)	LiT Survey (2023)
Percentage of secondary school teachers in dignified and fulfilling work	N/A	<p>Overall (60.3 percent)</p> <p>For detailed information, please see section 3.9.4.</p>	<p>Overall (61.5 percent)</p> <p>For detailed information, please see section 3.9.4.</p>
Percentage of teachers in secondary education institutions displaying core competencies in the National Teachers' Standards (NTS).	Overall (3.3 percent)	<p>Overall (3.3 percent)</p> <p>For detailed information, please see section 3.9.5.</p>	<p>Overall (15.2 percent)</p> <p>For detailed information, please see section 3.9.5.</p>
Percentage of teachers in secondary education institutions using digital technology to enhance their teaching.	Overall (0.0)	<p>Overall (0.0)</p> <p>For detailed information, please see section 3.9.6.</p>	<p>Overall (7.7)</p> <p>For detailed information, please see section 3.9.6.</p>
Percentage of teachers in secondary education institutions demonstrating Gender, Equality and Social Inclusion (GESI) responsive pedagogy.	Overall (8.7 percent)	<p>Overall (11.3 percent)</p> <p>For detailed information, please see section 3.9.7.</p>	<p>Overall (21.1 percent)</p> <p>For detailed information, please see section 3.9.7.</p>

	Indicator	Survey (2021)	LiT Survey (2022)	LiT Survey (2023)
Heads of schools and senior management	Percentage of schools providing i) career guidance ii) psycho-social and emotional counseling services iii) academic counseling iv) and have link with industry and tertiary institutions.	<i>Career guidance (53.2 percent)</i> <i>Psycho-social and emotional counseling services (4.3 percent)</i> <i>Academic counseling (36.2 percent)</i> <i>Link with industry (8.3 percent)</i> <i>Link with tertiary institutions (12.4 percent)</i>	<i>Career guidance (42.0 percent)</i> <i>Psycho-social and emotional counseling services (6.0 percent)</i> <i>Academic counseling (38.0 percent)</i> <i>Link with industry (6.0 percent)</i> <i>Link with tertiary institutions (19.0 percent)</i> <i>For detailed information, please see section 3.10.3</i>	<i>Career guidance 68.0 percent)</i> <i>Psycho-social and emotional counseling services (18.8 percent)</i> <i>Academic counseling (46.5 percent)</i> <i>Link with industry (28.1 percent)</i> <i>Link with tertiary institutions (76.3 percent)</i> <i>For detailed information, please see section 3.10.3</i>
	Percentage of secondary education institutions with an inclusive, gender-sensitive environment for staff and students.	<i>Overall (36.2%)</i>	<i>Overall (40.0%)</i> <i>For detailed information, please see section 3.10.2</i>	<i>Overall (49.0%)</i> <i>For detailed information, please see section 3.10.2</i>
	Number of boards and senior management teams of secondary education institutions that demonstrate understanding of their roles and responsibilities	<i>Overall (36.4 percent)</i>	<i>Overall (47.5 percent)</i> <i>For detailed information, please see section 3.10.1</i>	<i>Overall (58.6 percent)</i> <i>For detailed information, please see section 3.10.1</i>

	Indicator	Survey (2021)	LiT Survey (2022)	LiT Survey (2023)
	and can provide evidence of how they are discharging them.			

1.0 INTRODUCTION

1.1 Background to the Leaders in Teaching (LiT) programme

The Leaders in Teaching (LiT) Programme builds on the foundation laid by the two-year T-SHEL programme, which ended in January 2023, to achieve transformative change in Ghana's secondary education system. LiT seeks to ensure that the new secondary education curriculum is understood and taught effectively across all schools, increasing the proportion of teachers meeting the National Teachers' Standards and ensuring that young people who complete secondary education have proficiency in the 21st Century Skills and competency skills required to succeed in further studies, adult life, and the world of work.

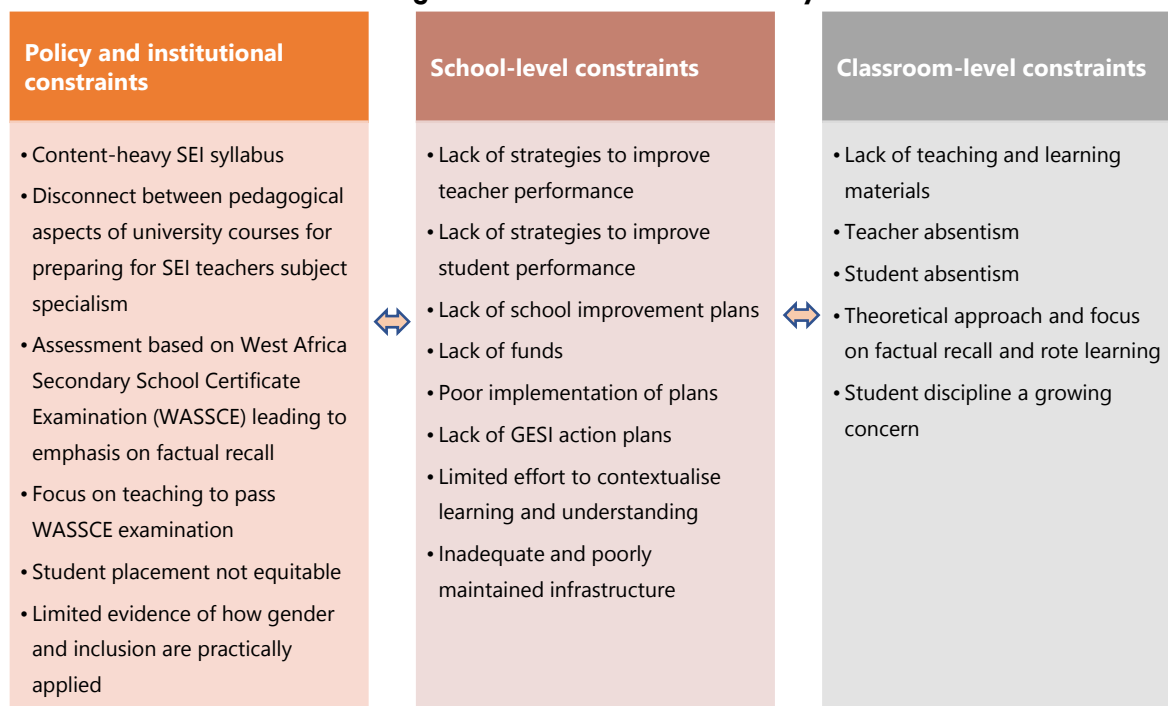
The LiT Programme aims to improve the quality of teaching and learning in Ghanaian SEIs namely, Senior high schools (SHS), senior high technical schools (SHTS), and technical institutes (TIs) to enable the young people to be prepared for lifelong learning, employability, and adult life through the acquisition of the needed 21st century skills and competencies through four core pillars:

1. **LEAD PILLAR:** To improve the leadership and management of SHS, SHTS and TIs so that school boards and leadership teams oversee effective learning-focused institutions with School Improvement Plans; school improvement plans (SIPs), conduct robust learning assessments; use accurate, timely and relevant data to inform decision-making; and ensure effective quality assurance and oversight of all SHS, SHTS, TIs and teacher education institutions through a performance management and accountability system linking classroom, school, district, regional and national levels.
2. **TRAIN PILLAR:** To improve the quality and relevance of preservice and in-service teacher education, so that all teachers in SHS, SHTS and TIs are delivering the new secondary education curriculum and adhering to the NTS.
3. **RECRUIT PILLAR:** To attract, recruit and retain quality teachers for secondary education institutions with a particular focus on the recruitment of women and addressing staffing issues in rural areas.
4. **MOTIVATE:** To improve teacher motivation and elevate the status and respect for the profession.

1.2 T-TEL's theory of change and intervention strategies

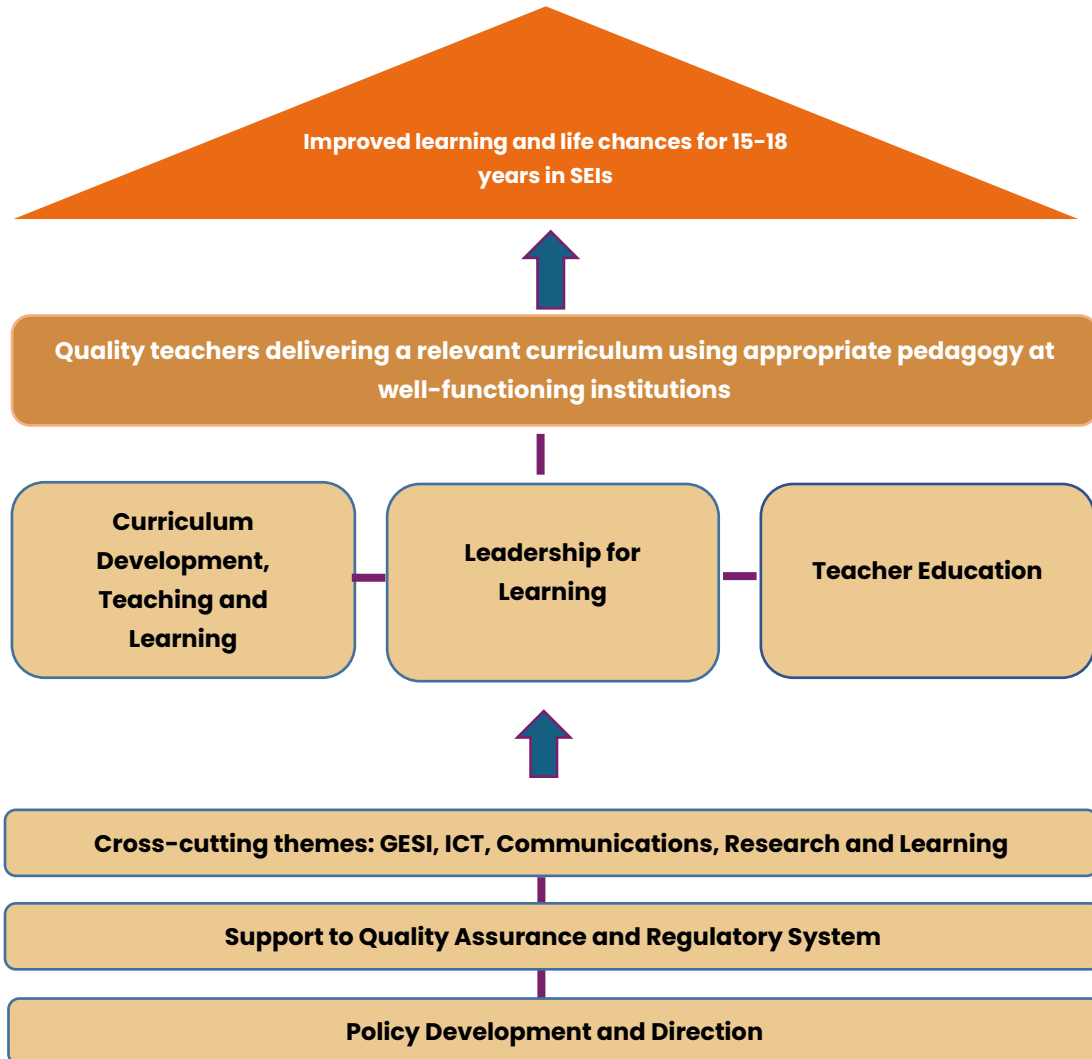
The programme theorizes that every secondary education institution (SEI) graduate in Ghana can be equipped with the subject knowledge and analytical and critical thinking skills needed to progress to further studies or successfully enter the world of work. However, there are constraints in the policy and institutional level, school-level, and classroom level that are impeding the achievement of these objectives (See figure 1.1).

Figure 1.1 Constraints in secondary education



In response to these assumptions, LiT is a complex, multicomponent programme (using a systems approach) with a wide range of interventions. These interventions seek to develop quality teachers to deliver relevant curricula using appropriate pedagogy within well-functioning institutions to improve SEI students' learning and life chances (See figure 1.2 for details).

Figure 1.2: How LiT's interventions address constraints



1.3 Purpose of the annual survey

This annual evaluation survey provides data to demonstrate the extent to which LiT's results are being achieved and help inform policy and practice to drive improvement in Ghana's SEIs. More specifically, the survey provides:

1. Data to measure progress against LiT's results framework (list of indicators can be found in annex 1) which in turn contributes to the Mastercard Foundation's shared measures within its Young Africa Work's Impact Framework.
2. Qualitative insights and explanation as to why the desired changes have or have not occurred.

3. Robust evidence that can inform policy and practice aimed at driving improvements in Ghana's secondary education institutions.

2.0 SURVEY METHODOLOGY

2.1 Sampling Design and Process

2.1.1 Sampling process for secondary education institutions

The sampling frame for the survey comprises all public SEIs in Ghana. A multistage stratified random sampling procedure was used to select SEIs and targeted respondents (teachers, headteachers, students, school management, and board) for the survey. Under this method, all public SEIs in Ghana were stratified by type (technical, vocational, and SHS), categories (A, B and C)², and then by geographic location (Northern, Middle, and Southern zones), giving 36 strata. This stratification enabled subgroup analysis to support programme intervention, design, resource allocation, and general programme improvement. In the second stage of the sampling process, 100 SEIs were randomly selected from the 36 strata using probability proportional to size. To achieve this, a Stata syntax was generated to select the 100 schools for participation in the survey randomly.

2.1.2 Sampling process for SEI students

Students in SEIs were stratified by subject (science and agriculture/home economics, general and visual arts and business/engineering, business trade, hospitality, fashion, design and building trade, etc.) and year (first and second-year students). This was to ensure that students pursuing various disciplines at different levels of study were equally represented in the sample. By ensuring equal representation of students pursuing all disciplines, the results are representative of SEI students in Ghana. Twenty-four students split³ between males and females for first and second years were randomly sampled from each school to participate in the student assessment test. The Kish Grid⁴ was used to support the sampling process to ensure that every student was given an equal chance to participate in the assessment test. Overall, 2,398 students were assessed on subject knowledge (reading, mathematics, science) and 21st century skills⁵. In addition, 2,398 students completed the student questionnaire as part of the teacher lesson-observation subsample.

² The secondary schools have been classified by the Ghana Education Service (GES) into categories based on a pre-agreed definition by both Ministry of Education (MoE) and GES. Category 'A' schools are the best in the country, followed by the 'B', 'C' and 'D'. Categories are based on schools' academic performance and facilities. The list is updated every year. This report uses such classification to ensure a proportional representation of each school category.

³ Females represented 49.5 percent of all SEI students in 2020.

⁴ A Kish grid provides a method to randomly choose survey respondents. The method avoids selection bias, which is usually a result of not using the correct procedures to choose respondents. The grid addresses this problem by assigning numbers to each respondent. The most important aspect of the grid is that it assigns an equal probability of selection for each possible survey participant.

⁵ Each student was required to complete two assessments provided to them at random. However, not all students completed the two assessments.

2.1.3 Sampling of SEI teachers for the teacher survey

Stratified random sampling was used to identify teachers in SEIs to be surveyed. Teachers in each sampled SEI were first categorized by subject (core and elective courses), level of study (first and the second year), and then sex, after which they were randomly selected. This approach ensured that all teachers had an equal chance of being included in the study. Fifteen teachers were randomly sampled in each sampled SEI to participate in the teacher survey. This process yielded a sample size of 1,489 teachers from the 100 SEIs.

2.1.4 Sampling of SEI teachers for lesson observation

In a subsample of 50 randomly selected SEIs, 389 teachers were randomly sampled from first- and second-year classes. These teachers were observed in the classroom⁶. The sampling ensured a suitable representation of male and female core subject teachers. In addition to having their lessons observed, the teachers were interviewed to provide insight and triangulate the observed results. Moreover, six students from an observed teachers' classroom were randomly selected to participate in the student survey and key informant interviews. The students' questionnaires were self-administered.

2.1.5 Sampling process for heads and senior management of SEI

In each sampled SEI, one member of a sampled school's senior management team (i.e., assistant head, bursar, etc.) and the head of school were interviewed to evaluate whether the leadership of SEIs understood their roles and responsibilities and could demonstrate with evidence the execution of these roles. In total, 196 stakeholders in this group were interviewed.

2.1.6 Sampling process for school board

Two board members were interviewed in each sampled SEI to solicit their opinions on policy measures to promote effective teaching and learning to enhance secondary education in Ghana.

2.1.7 Sampling process for government agencies

Senior staff of six government agencies⁷ were interviewed to assess the development and implementation of new policies, regulations, and strategies that are targeted at improving teacher

⁶ Each lesson lasted about 45 minutes for single periods and 90 minutes for double periods. Care was taken to ensure that no teacher was observed twice even if that teacher teaches more than one subject. While the school was informed in advance that lessons of sampled teachers would be observed, the selection of teachers was random. This prevented the teachers putting on a show for the lesson observation team and ensured that the lesson observations captured a typical situation in the schools.

⁷ These include senior staff of GES, MoE, National Council for Curriculum and Assessment (NaCCA), National Teaching Council (NTC), National Schools Inspectorate Authority (NaSIA), GTEC.

and secondary education. The interviews also covered changes in the practices of the institutions resulting from implementing their policies and programmes.

2.1.8 Sampling process for parents, opinion leaders and alumni

In each of the districts where a sampled SEI is located, parents, opinion leaders, alumni and other stakeholders were interviewed to solicit their opinions on ways to improve secondary education. A total of 586 stakeholders were interviewed across the regions. Table 2.1 summarises the sample sizes for each of the stakeholders sampled above.

Table 2.1 Summary of sample allocation for quantitative surveys

	Target	Actual	Response Rate
Teacher survey	1,500	1,489	99.3%
Teacher lesson observation	400	389	97.3%
Teacher follow-up interview	400	389	97.3%
Head of schools/senior management interview	200	199	99.5%
Student assessment item	4800	4796	99.9%
Parents, community leaders and alumni (in school community)	600	586	97.7%
Members of school boards	200	186	93.0%

2.1.9 Qualitative survey

To complement the quantitative data, qualitative data were collected to assess how and why expected changes are or are not occurring. The data were collected via focus group discussions (FGDs), Key informant interviews (KIIs), and case studies. These methods were used for all stakeholders. Table 2.2 presents the sample distribution for the qualitative survey.

Table 2.2 Summary of sample allocation for qualitative data collection

Target stakeholder	Target	Actual	Response Rate
Teachers in SEI (Case studies)	30	31	103%
Head teacher case studies	30	31	103%
SEI students FGDs	10	10	100%
Board of Governors (Case studies)	30	31	103%
Senior management (Case studies)	30	30	100%

Target stakeholder	Target	Actual	Response Rate
Ghana Education Service, Regional Monitoring Team (RMT) – All 16 regional offices	16	16	100%

2.2 Development of 2023 survey instruments

Thirteen data collection tools were developed for the 2023 survey (See box 2.1). The survey adopted the same tools used for the 2022 survey. In developing the tools, the team was guided by LiT’s monitoring, evaluation and learning (MEL) framework, which contains the programme indicators, definitions, methods of measurement, data collection, and analysis. An extensive literature review was also conducted to explore comparable instruments that had been deployed in similar education studies in Ghana and elsewhere. The team also worked closely with the LiT adviser and coordinator to develop, pilot, and refine the data-collection tools that measured the indicators and triangulated data to provide a robust, composite measurement.

Scoring rubrics were also developed to determine and make explicit the ideal composite scores needed to be considered “demonstrating” the specific practices or competencies highlighted in LiT’s MEL framework. For example, the composite score for the output indicator (percentage of teachers in secondary education institutions displaying core competencies in the NTS) is an average of the three scores that a teacher receives for the lesson observation, follow-up interview, and student questionnaire.

Box 2.1 Data collection tools

- Tool #1A: Reading Literacy Assessment
- Tool #1B: Mathematics Literacy Assessment
- Tool #1C: Science Literacy Assessment
- Tool #1D: 21st Century Skills Assessment
- Tool #2A: SEI Teacher Lesson Observation
- Tool #2B: SEI Teacher Follow-up Interview Guide
- Tool #2C: SEI Student Questionnaire
- Tool #2D : SEI Teacher Survey Questionnaire
- Tool #2E: Teacher Interview Guide
- Tool #3A: Boards/Senior Management Interview Guide
- Tool #3B: Boards Interview Guide
- Tool #4A: Student follow up interview
- Tool #5B: Parents/Opinion leaders/Alumni interview Guide
- Tool #6A: Regional Monitoring Team interview
- Tool #6B: National level interviews

2.3 Pretesting of tools

The student assessment tools (namely, reading, mathematics, science literacy and 21st century skills) were the same tools used for the 2022 survey. The assessment tools were pretested in category A, B, and C schools in the Greater Accra region to examine the students' responses to individual test items (questions), and to assess the quality of those items and the test. Results of the pretest (see annex 2) were used to revise the student assessment tools. In addition, other instruments were pretested with a cross-section of target respondents and revised before final deployment. The lesson observation and teacher interview guides had been used in several T-TEL studies and were therefore not subjected to additional pretesting.

After the pretest, the tools were revised to improve clarity and implementation, and the revised tools were again shared with T-TEL's key advisers for their technical comments and inputs. The final pretest report, including the final survey tools, are in annex 2.

2.4 Data quality control

Five field supervisors randomly visited the data-collection teams in the 16 regions to observe the data-collection process to ensure that the enumerators adhered to the survey protocols. The supervisors verified that nonresponses were not deliberate omissions by enumerators. Also, spot checks, re-interviews, and classroom observations were conducted to ensure compliance. Open Data Kit software allows for cross-referencing observations and re-interviews with the original records by enumerators. The data management team at JMK cross-checked the observations and interviews conducted by the supervisor with the interview records to compute interrater reliability tests. A Kappa model generated 89.8 percent agreement for the teacher observation. The supervisors and quality assurance team provided technical support to the enumeration team when they found significant differences between the observation and interview records the respective enumerator had collected.

2.5 Data management and analysis

The data collected were imported from the SurveyCTO platform and analyzed using Stata software. A Do File was computed to store the syntax of the analysis, which was applied in follow-up surveys using the same computational procedures for purposes of uniformity. Data were analysed using descriptive statistics to establish disaggregated scores based on the relevant variables. The analysis was informed by the specific computational procedures provided in the approved data analysis plan. Beyond the descriptive statistics, a multivariate analysis was conducted using multiple linear regression models and exploratory factor analysis for relevant indicators. T-tests and analysis of variance tests were conducted to test for significant differences in results where applicable. The multiple regression models helped measure the effect of demographic characteristics on key output and outcome indicators. Qualitative data analysis was conducted using thematic and content analysis to explain why desired changes had or had not occurred.

3.0 RESULTS

3.1 Demographic profile of key stakeholders

3.1.1 Profile of SEI students

Nearly 2,400 senior high students were assessed in reading, mathematics, science literacy, and 21st century skills. Slightly more than half of the students assessed were female (51.3 percent), while males constituted 48.7 percent. Also, 2,399 students completed self-assessment questionnaires to triangulate the results of the teacher lesson observation. Again, there were about equal proportions of male and female students.

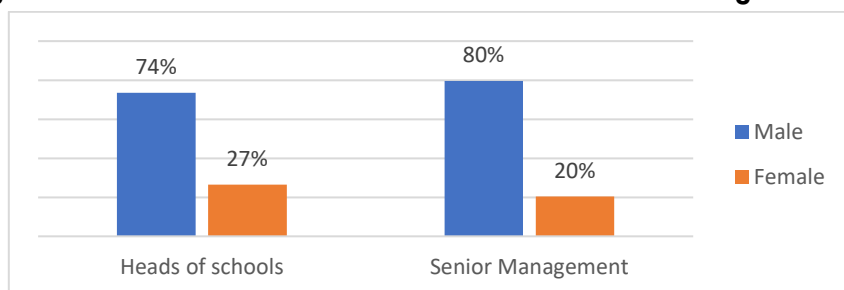
3.1.2 Profile of SEI teachers

The lesson observation included 389 teachers, 72.5 percent of whom were males and 27.5 percent were females. Additionally, about 1,489 teachers participated in a teacher survey. Of these, male teachers were 77.4 percent. The findings show that 19.3 percent of teachers had taught for less than 5 years, 30.5 percent for 5 to 10 years, and 50.2 percent for more than 10 years.

3.1.3 Profile of heads of schools and senior management staff

Figure 3.1 illustrates the distribution of heads of schools and senior management staff by sex.

Figure 3.1 Sex distribution of heads of schools and senior management staff



3.1.4 Profile of school board members

A total of 186 school board members were reached. A majority (85.5 percent) were men. Moreover, about three-quarters of the board members have served for less than 4 years, almost one-quarter have been doing so for 4 to 10 years. The remainder (1.6 percent) have been board members for more than 10 years.

3.1.5 Profile of parents, opinion leaders and alumni

The survey also engaged 586 stakeholders to ascertain their perspectives on secondary education in Ghana. As provided in table 3.1, a higher proportion of the stakeholders were male (72.4 percent).

Three in 10 stakeholders were either parents or alumni. Community leaders like chiefs, assembly members and district officers made up 16.2 percent.

Table 3.1 Category of stakeholders interviewed (%)

Stakeholders	Male	Female	Total
Parent	35.4	41.4	37.0
Alumni	34.7	44.4	37.4
Community leader (district chief executive, member of parliament, , chief, assemblyman/woman, etc.)	19.8	6.8	16.2
Religious leaders	5.4	2.5	4.6
Agencies and development partners	0.2	0.0	0.2
Unions	1.2	3.1	1.7
Civil society organizations (CSO)	0.7	1.2	0.9
Others	2.6	0.6	2.1
Total (N)	424	162	586

NOTE: Percentages may not sum up to 100% due to rounding

3.2 SEI student outcome

3.2.1 What does the student assessment measure?

NaCCA created a team of assessment experts to develop proficiency thresholds for SEI student assessments. The experts defined each of the assessment areas:

- **Reading literacy** addresses students’ capacity to understand, use, evaluate, reflect on, and engage with texts to achieve their goals, develop knowledge and potential, and participate in society.
- **Mathematics literacy** addresses students’ capacity to formulate, employ and interpret mathematics in a variety of contexts. Such literacy includes reasoning mathematically and using mathematical concepts, procedures, facts, and tools to describe, explain and predict phenomena.
- **Science literacy** addresses students’ ability to engage with science-related issues and with the ideas of science as reflective citizens. A scientifically literate person is willing to engage in reasoned discourse about science and technology. Doing so requires the competencies to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically.
- **21st century skills** address competencies such as foundational knowledge, problem-solving skills, and character qualities.

3.2.2 Test administration and monitoring

For 2023, the study assessed 2,398 year one and year two students in 100 sampled schools. The transition of students meant that these students, as of 2024, were in year two and three, respectively.

Akin to the 2022 assessment, the 2023 assessments were paper-based. The 2022 and 2023 test items (see annex 2) were identical and consisted of multiple-choice questions and questions requiring students to construct their own responses. Students also completed a short background questionnaire, which sought information about the students, their basic school education, and a questionnaire on climate change.

3.3 Results of the student assessment

3.3.1 How the results of the student assessments are reported.

NaCCA developed proficiency thresholds following an analysis of the assessment instruments⁸:

- a. Highly proficient – Students show a high level of proficiency in terms of knowledge and skills; can transfer them automatically and flexibly through authentic performance tasks.
- b. Proficient – Students demonstrate a sufficient level of proficiency, fundamental knowledge, skills, and core understanding; they can transfer them independently through authentic performance tasks.
- c. Approaching proficiency – Students are approaching proficiency in terms of knowledge and skills, and core understanding with little guidance; they can transfer understanding through authentic performance tasks.
- d. Developing – Students are developing proficiency in minimum knowledge and skills but need help throughout the performance of authentic tasks.
- e. Emerging – students are struggling with their understanding due to a lack of essential gaps in knowledge and skills.

Following the benchmarking of the student assessment instruments, NaCCA identified “Approaching proficiency” as the minimum level of proficiency that students should acquire by the end of their secondary education in reading, mathematics, and science literacy. That of the 21st century skills assessment was set at “Proficient” to align with OECD’s Programme for International Student Assessment⁹.

⁸ NaCCA developed the proficiency thresholds in the following way: ([See Annex 3](#)).

⁹ PISA is the OECD’s Programme for International Student Assessment. PISA measures 15-year-olds’ ability to use their reading, mathematics and science knowledge and skills to meet real-life challenges

3.3.2 What students know and can do.

In Reading literacy

- One-tenth of the students across the 100 sampled schools can identify the main idea in a text of moderate length since they are approaching proficiency in reading literacy. These students can also reflect on simple visual or typographical features, compare claims, and evaluate the reasons supporting the claims based on short, explicit statements.
- Compared with 2022, there is a slight decline in the proportion of students approaching proficiency in reading literacy in 2023 (figure 3.2). The fall in the share of students approaching proficiency in reading coincides with the rise in proportion of those who are still emerging in reading literacy. In Adankwaman Senior High (66.7 percent), and Moree Community Senior High (75.0 percent), 6 in 10 students were approaching proficiency in reading literacy ([table A3.2¹⁰](#)).

In Mathematics literacy

- On average, across the sampled schools, about 8 percent of students can conceptualise, generalise, and utilise information based on their investigations. Some of these students can develop models for complex situations, identify constraints and specify assumptions. At the minimum, these approaching proficiency students in mathematics can typically show some ability to handle percentages, fractions, and decimal numbers and work with proportional relationships in 2023 ([table 3.8](#)).
- Most students were either developing or emerging in mathematics literacy in 2023.

In Science literacy

- On average, about 30 percent of the students were approaching proficiency in science literacy in 2023 ([table 3.13](#)). At a minimum, these students can draw on moderately complex content knowledge to identify or construct explanations of familiar phenomena. In less familiar or more complex situations, these students can construct explanations with relevant cueing or support. Additionally, 2 in 10 students can distinguish between arguments that are based on scientific evidence and theory and those based on other considerations and can also use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events and processes involving multiple causal links.

In 21st century skills

- The share of students who were approaching proficiency in 21st century skills declined from 2022 to 2023. These are students who can identify and analyse moderate problems and resolve them. Conversely, there is an increase in the share of students who demonstrated

¹⁰ All tables that begin with an "A" prefix can be found in annex 3

proficiency or higher (29.2 percent) in 2023. The share of those who can identify and analyse multiple perspectives to make predictions well beyond the information given in a problem while also effectively evaluating large amounts of information has increased.

3.4 Evaluation of reading literacy assessment

3.4.1 Reading literacy assessment

Reading achievement is essential for a wide variety of human activities – from following instructions, determining the who, what, when, where, and why of a situation; the many ways of communicating with others for specific purposes or transactions. Reading is also a component of other domains of knowledge. Real-life problems often require people to draw on their knowledge of mathematics and science. People must be able to read well to obtain the information they need. People also need to engage in the critical and analytical thinking inherent in reading as they make use of written information for their own purposes. No less important, literacy in reading is essential for a country's social, economic, and political development.

3.4.2 The framework for assessing reading literacy

The reading literacy framework (annex 2) conceptualizes reading literacy as an activity in which readers interact with the text they read and the tasks they want to accomplish during or after reading it. To be as complete as possible, the assessment covered three dimensions: texts (the range and format of the reading material), aspects (the type of reading task or reading processes involved), and situations (the range of contexts for which the text was constructed).

Text type

The reading literacy framework classified text type along six dimensions:

- Description (process in a technical manual, catalogue, blog, diary)
- Narration (novel, comic strip, report in a newspaper)
- Exposition (essay, entry into encyclopaedia)
- Argumentation (letter to the editor, posts in an online forum)
- Instruction (recipe, instructions for operating software)
- Transaction (personal letter to share news, text messages to arrange a meeting)

Aspects/cognitive processes

The assessment framework for reading literacy identified three aspects or cognitive processes:

- Access and retrieve within a text (navigating a text to locate and retrieve a particular piece of explicitly stated information). Search for and select relevant text.

- Integrate and interpret (processing what is read to make internal sense of a text). Represent literal information (comprehending the literal meaning of sentences and passages). Integrate and generate inferences (going beyond the literal meaning of information)
- Reflect and evaluate (drawing upon knowledge, ideas, or attitudes beyond the texts to relate the information provided in the texts to one's own conceptual and experiential frames of reference). Assess quality and credibility, reflect on content, and form and detect and handle conflict (determining whether multiple texts corroborate or contradict each other).

Situations

Situations refer to the contexts and purposes for which the text was constructed. Four situations are identified:

- Personal (letters, fiction, diary-style blogs)
- Public (public notices, news websites)
- Occupational (job advertisement in a newspaper or online)
- Educational (textbooks, interactive learning software)

Cognitive demand

- Low – Recall of a fact, term, principle, or concept or locate a single point of information.
- Medium – Use and apply conceptual knowledge to describe or explain phenomena.
- High – Analyse complex information, synthesize or evaluate evidence, justify reason given using several sources, develop a plan or sequence of steps to approach and resolve a problem.

3.4.3 Proficiency levels for reading literacy

The results of the reading literacy assessment are reported using proficiency levels (based on NaCCA's work, see annex 1) and mean scores. Table 3.2 illustrates the range of reading literacy proficiency levels that the survey covers.

Table 3.2 Proficiency levels for reading literacy

Level of proficiency	Score	Characteristics of tasks
Highly proficient	80 - 100%	<p>Highly proficient readers can comprehend lengthy and abstract texts in which the information of interest is deeply embedded and only indirectly related to the task. They can compare, contrast, and integrate information representing multiple and potentially conflicting perspectives, using multiple criteria, and generating inferences across distant pieces of information to determine how the information may be used.</p> <p>Highly proficient readers can reflect deeply on a text's source in relation to its content, using criteria external to the text. They can compare and contrast information across texts, identifying and resolving intertextual discrepancies and conflicts through inferences about the sources of information, their explicit or vested interests, and other cues as to the validity of the information.</p> <p>Tasks at this level typically require the reader to create elaborate plans, combining multiple criteria and generating inferences to relate the task and the text(s). Materials at this level include one or several complex and abstract text(s), involving multiple and possibly discrepant perspectives.</p>
Proficient	68 - 79%	<p>Readers at the proficient level can comprehend lengthy texts, inferring which information in the text is relevant. They can perform causal or other forms of reasoning based on a deep understanding of extended pieces of text. They can also answer indirect questions by inferring the relationship between the question and one or several pieces of information distributed within or across multiple texts and sources.</p> <p>Reflective tasks require the production or critical evaluation of hypotheses, drawing on specific information. Readers can establish distinctions between content and purpose, and between fact and opinion as applied to complex or abstract statements. They can assess neutrality and bias based on explicit or implicit cues. They can also draw conclusions offered in a piece of text.</p> <p>For all aspects of reading, tasks at the proficient level typically involve dealing with concepts that are abstract</p>

Level of proficiency	Score	Characteristics of tasks
		<p>or counterintuitive and require several steps until the goal is reached.</p>
Approaching proficiency	54 - 67%	<p>Readers at this level can identify the main idea in text of moderate length. They can understand relations or construe meaning within a limited part of the text when the information is not prominent by producing basic inferences, and/or when the text(s) include some distracting information.</p> <p>They can select and access a page in a set based on explicit though sometimes complex prompts and locate one or more pieces of information based on multiple, partly implicit criteria.</p> <p>Readers at this level can, when explicitly cued, reflect on the overall purpose, or on the purpose of specific details, in texts of moderate length. They can reflect on simple visual or typographical features. They can compare claims and evaluate the reasons supporting the claims based on short, explicit statements.</p> <p>Reading at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make comparisons between the text and outside knowledge by drawing on personal experience and attitudes.</p>
Developing	40 - 53%	<p>Developing readers can evaluate the literal meaning of simple sentences. They can also interpret the literal meaning of texts by making simple connections between adjacent pieces of information in the question and/or the text.</p> <p>Readers at this level can scan for and locate a single piece of prominently placed, explicitly stated information in a single sentence, a short text, or a simple list. These readers can access a relevant page from a small set based on simple prompts when explicit cues are present.</p>
Emerging	39% and below	<p>Few emerging readers can understand and affirm the meaning of short, syntactically simple sentences on a literal level and read for a clear and simple purpose</p>

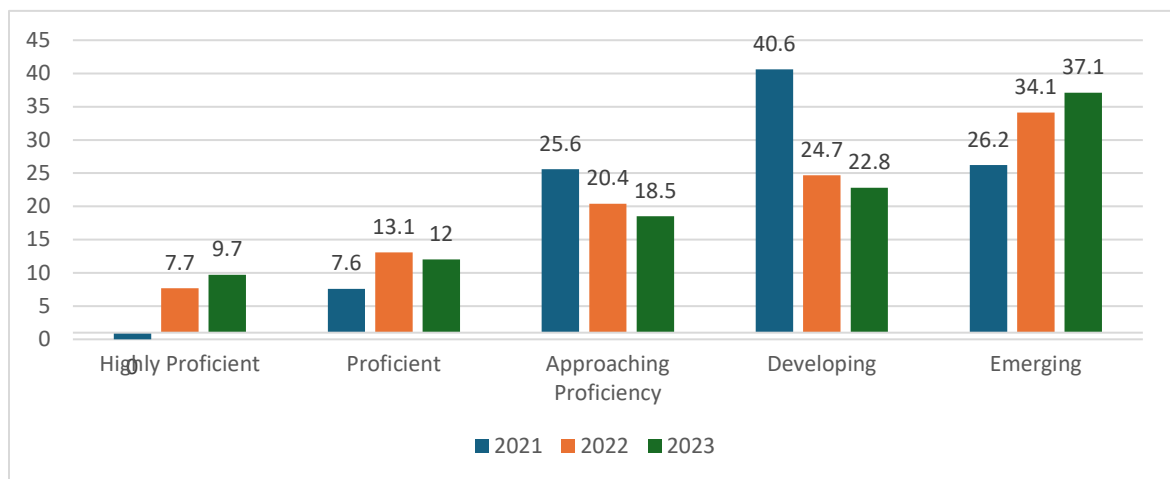
Level of proficiency	Score	Characteristics of tasks
		within a limited amount of time.

3.4.4 How students performed in reading literacy

Except for the marginal rise in the proportion of students who attained high proficiency in reading and the slight increase in the share of students who were emerging in 2023, students' performance in reading literacy was similar in 2022 and 2023.

In 2023, the share of students approaching proficiency or higher in reading literacy declined slightly from 20.4 percent to 18.5 percent (figure 3.2 and table 3.3). These students, at the least, can identify the main idea in a moderately lengthy text. They can understand relationships or construe meaning within a limited part of the text when the information is not prominent by producing basic inferences and/or when the text(s) include some distracting information. Moree Community Senior High (75.0 percent), Adankwaman Senior High (66.7 percent), and Agotime Senior High (58.3 percent) recorded the highest proportions of students approaching proficiency in reading literacy (table A3.3). Schools in the Central (31.6 percent) and Western (25.0 percent) regions had the greatest share of students approaching proficiency in reading literacy (table A3.2). There was no gender variation in the proportion of students who are approaching proficiency in reading literacy in 2023.

Figure 3.2 Percentage of students at different levels of reading proficiency



Similar to the 2022 results, about 2 in 10 students across the 100 sampled schools were top performers in reading literacy in 2023 because they attained “proficient” or “highly proficient” levels in reading literacy. Such students can comprehend lengthy texts, deal with abstract or counterintuitive concepts, and establish distinctions between facts and opinions based on implicit cues pertaining to the content or source of information. In seventeen (17) schools, over 50 percent of the students were top performers, with all students in Kwahu Tafo Senior High (100 percent) and Notre Dame Girls Senior High (100 percent) being top performers in reading literacy ([table A3.3](#)). It is, however, worth noting that there were no top performers in reading literacy in 33 schools ([table A3.3](#)). Most of these schools are category C schools.

Similar to the 2022 (34.1 percent) results, 37.1 percent of students were emerging in reading literacy in 2023. Few of these students can understand and affirm the meaning of short, syntactically simple sentences on a literal level or read for a clear and simple purpose within a limited amount of time. Over 70 percent of the emerging students are from North East (77.8 percent), Upper West (75.0 percent), and Oti (72.2 percent). In three schools, including Langbinsi Senior High, Northern Star Senior High, and Sang Community Day Senior High, all the students were emerging in reading literacy ([table A3.3](#)).

3.4.5 SEI students’ attainment of the different proficiency levels in reading literacy

[Table 3.3](#) presents the distribution of students across the five levels of reading proficiency.

Highly proficient

Highly proficient students can comprehend lengthy and abstract texts in which the information of interest is deeply embedded and only indirectly related to the task. They can compare, contrast, and integrate information representing multiple and potentially conflicting perspectives, using multiple criteria, and generating inferences across distant pieces of information to determine how the information may be used.

Almost 10 percent of students were highly proficient in reading literacy in 2023. This proportion was much higher in category A schools (27.5 percent), especially at Notre Dame Girls SHS (91.7 percent) and Notre Dame Seminary SHS (75.0 percent) than in category B and C schools ([table A3.3](#)). Comparatively, Upper East region (21.7 percent) recorded the highest proportion of highly proficient students in reading literacy followed by Bono Region (19.1 percent) ([table A3.3](#)). The share of category C school students who were highly proficient readers rose from 2.7 percent to 8.8 percent in 2023. Diaspora Girls’ Senior High recorded the highest proportion (83.3 percent) of highly proficient readers in 2023 among the category C schools ([table A3.3](#)). A follow-up interview with the head of Diaspora Girls’ Senior High School revealed an interesting insight into why the students were performing well in

reading literacy. According to the head of the school, she indicated that upon her assumption of office, in collaboration with some committed teachers, she swiftly designed and implemented policies such as dawn prepping, peer teaching, organizing an “academic harvest” event to acknowledge, give commendation letters, dine with the three best students in a grade and applaud 10 best students. The school organized a reading club with a special focus on students who were struggling to read after realising that their performances (including that of reading) were low. Excerpts of what she said regarding their strategies to improve performance in reading include her statement on the formation of a reading club *“I personally introduced a reading club in the school and instructed teachers to identify and include in the club those who could not read. I did not want anybody who could read to be in the reading club.”*

In addition, she mentioned that *“We introduced Dawn Prep where students would usually learn on their own before school would begin. So, we were doing that. Then we also introduced peer teaching, where we identified the above average and average students, and then we gave them tuition in certain areas. Then they would, in turn, also help their mates at a particular time, like on Wednesday, from 8 o'clock or so, they do peer teaching.”*

Proficient

Top performers in reading literacy also include students who are proficient readers. At this level, students can comprehend lengthy texts, inferring which information in the text is relevant. They can perform causal or other forms of reasoning based on a deep understanding of extended pieces of text. They can also answer indirect questions by inferring the relationship between the question and one or several pieces of information distributed within or across multiple texts and sources.

About 12 percent of students in all 100 schools were proficient readers in 2023, while 13.1 percent of students were also proficient readers in 2022. The relapse seems to have been dominant among students in category B schools since, compared with 2022 (18.1 percent), 10.6 percent of students attained proficient level in reading literacy in 2023. Category A and single-sex schools had the greatest share of their students performing at the proficient level in reading literacy in 2023 compared with category B, C, and mixed schools. It is worth mentioning that some category C schools like Presby Senior High/Tech, Kwamang (61.5 percent) and Business Senior High, Tamale (41.7 percent) were among schools with the highest proportion of students being proficient readers ([table A3.3](#)).

Approaching proficiency

NaCCa has defined “approaching proficiency” as the minimum proficiency level for secondary school students. At this level, readers can identify the main idea in text of moderate length. They can understand relationships or construe meaning within a limited part of the text when the information

is not prominent by producing basic inferences and/or when the text(s) include some distracting information. They can select and access a page in a set based on explicit, though sometimes complex, prompts and locate one or more pieces of information based on multiple, partly implicit criteria.

On average, 18.5 percent of students were approaching proficiency in reading literacy in 2023. The proportion of students approaching proficiency in reading literacy in 2023 was highest among single-sex schools, category B schools, and Form 2 students. [Tables A3.2](#) and [A3.3](#) disaggregate the result by region and school.

Developing

Developing readers can evaluate the literal meaning of simple sentences. They can also interpret the literal meaning of texts by making simple connections between adjacent pieces of information in the question and/or the text.

Across the 100 sampled schools, the proportion of students developing reading literacy proficiency dropped slightly from 24.7 percent in 2022 to 22.8 percent in 2023. The largest proportion of students developing proficiency in reading literacy were from mixed-schools, category B schools, Form 1 students, females, and the Volta region (34.6 percent). About half and more of the students in 11 of the 100 sampled schools were developing proficiency in reading literacy in 2023.

Emerging

The trend in students' attainment at the various proficiency levels depicts a decline in the proportion of students attaining higher proficiency levels and a rise in those who are struggling to understand reading because they lack essential foundational knowledge and skills. On average, across the 100 sampled schools, there was a slight increase in the proportion of emerging readers from 34.1 percent in 2022 to 37.1 percent in 2023. Few of these students can understand and affirm the meaning of short, syntactically simple sentences on a literal level and read for a clear and simple purpose within a limited amount of time. Compared with 2022, the share of emerging students declined in single-sex schools and category A schools in 2023. A notable finding shows that 34 of the 100 schools had at least 50 percent of their students attaining this level of proficiency.

Follow-up interviews conducted with the heads of schools at some selected schools in the North East, Upper West, Savannah, Oti, and Bono East regions to ascertain why a majority of their students performed at this level presented interesting insights. The heads of schools interviewed lamented students' lack of requisite foundational knowledge in reading literacy. This situation affected their ability to grasp the content of other subjects like mathematics and science. Moreover, many of these

students lack home support or motivation to read or practice what they learn. Others are unable to provide extra tuition support or even if they do, most students do not stay after school hours since they are not boarding students. The lack of library facilities and supplementary reading materials like story books also contributes to students' low performance in reading literacy. Here are some relevant comments from school heads:

- *"The group of students that are posted to this [school] are not good. Most of them are not good...They can't even read, let alone write. So that is where I'm coming from."*
- *"We mostly get students with an aggregate 40 from [the Basic Education Certificate Examination] (BECE) coming into our school. The best we get is aggregate 33, 34 in this school. Imagine students with aggregate 40 to 50, coming from very rural schools where teachers hardly accept postings to. These students often struggle on their own and once they do not get the platform to practice and they do not get the necessary guidance, they come with such weak results. And, you know, once your foundation in reading is challenged, many other things will be challenged in terms of your educational career."*
- *"Our students lack proper basic or foundational knowledge. Their inability to read is emanating from the basic levels. After conducting entrance assessment for them, we realized that some students could not even read three-letter words. So, we had to do our own remediation to enable them to pick up."*

The following are also direct quotes from heads of schools on lack of boarding status and facilities as direct contributory factors to students' low performance in reading literacy.

- *"If our school was boarding, we could have done the extra work by, for instance, organizing after school classes. Unfortunately, immediately they all go back to their houses they hardly review their books but rather idle about like they used to in junior high school (JHS). But if we had boarding facilities, of course, we could have additional time to support them. Currently, interventions like extra classes are not effective since, most of the students do not come back [after school]. A few of them come back [after school] to attend the classes."*
- *"We are actually challenged at the school level as a day school. But we are taking steps to make it a boarding school. Though we have found some hostels for students to stay in, we are yet to secure accommodation for teachers too. Besides, we lack some other facilities like a library."*

- *"... another challenge is that the school is not situated in Berekum town. It's far away from the town. So, considering the location of the homes of students, they usually travel longer distances before getting to school. Even in some cases getting money to pick a taxi to school becomes challenging. We have therefore applied for boarding status to help resolve this."*

Regarding support or motivation from the home, the heads said that:

- *"Yes, we have a problem with the home. Supervision and monitoring are lacking. You see, when we have students that are coming from good homes, already they know how to study. They are motivated. They may even have some of their siblings, family members who are perhaps at higher positions. And these are sort of motivations to them. But when they are not, or perhaps staying with their grandmother, who is a peasant farmer, and they do not see anything that is motivational they will have this challenge. If we move to their homes; and I have teachers who go to their homes to follow up on those who do not come to school. We realized that they have challenges ranging from financial, marital, and a lot of problems coming from their homes which demotivate them. They are not motivated."*
- *"And also, they come from families that do not have many people who are literate. So, either the person strives to read on their own or they do not have any other person to inspire them to read. Therefore, unless the person is just self-motivated, which hardly is the case. At home, they are engaged in doing house chores instead of being motivated to read on their own. All of these contribute to their weakness in reading."*
- *"I suspect it's an environmental influence. The environment in which they find themselves. Mm-hmm. Because once they come to school, they start to pick up good reading influences, but when they get back to the local community, they do not get people to speak English with."*

Table 3.3 Percentage of students at different levels of reading literacy

Assessments	Highly Proficient (80–100%)			Proficient (68–79%)			Approaching Proficiency (54–67%)			Developing (40–53%)			Emerging (0–39%)		
	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023
Sex															
<i>Male</i>	0.0	6.0	5.9	5.8	10.5	9.6	25.7	23.3	17.8	40.6	26.0	22.2	27.9	34.1	44.6*
<i>Female</i>	0.0	9.3	12.6	9.5	15.5	13.9	25.4	17.5	19.0	40.6	23.5	23.3	24.5	34.1	31.3
Level of student															
<i>Form 1</i>	0.0	6.9	7.2	7.8	12.3	10.0	26.7	18.6	15.6	39.0	24.2	23.6	26.5	33.1	43.8
<i>Form 2</i>	0.0	8.6	12.2	7.4	14.0	14.2	24.4	22.1	21.3	42.2	24.9	22.0	26.0	30.5	30.3
School category															
<i>Category A</i>	0.0	27.5	28.6	24.1	12.6	19.1	37.0	18.0	17.9	26.9	23.4	16.7	12.0	18.6	17.9
<i>Category B</i>	0.0	7.3	6.7	9.3	18.1	10.6	23.0	21.5	22.2	37.3	22.0	22.2	30.5	31.2	38.6
<i>Category C</i>	0.0	2.7	8.8	4.4	10.1	11.8	25.1	20.2	17.3	44.1	26.9	23.6	26.4	40.2	38.5
School sex															
<i>Mixed-sex school</i>	0.0	5.9	6.8	6.3	13.3	11.3	24.7	19.6	18.2	41.5	24.9	23.8	27.5	36.3	39.8
<i>Single-sex school</i>	0.0	23.1	42.7*	23.8	11.4	19.8	36.9	26.2	20.8	28.6	23.1	11.5	10.7	16.2	5.2*
Overall	0.0	7.7	9.7	7.6	13.1	12.0	25.6	20.4	18.5	40.6	24.7	22.8	26.2	34.1	37.1

*p<0.05

NOTE: The figures may not add up to 100% due to rounding

Table 3.4 Students' mean assessment scores in reading literacy by demographic characteristics (%)

	Survey 2021	Survey 2022	Survey 2023
Sex			
<i>Male</i>	46.9	48.5	43.9
<i>Female</i>	48.2	49.7	51.4
Level of student			
<i>Form 1</i>	47.6	47.6	43.7
<i>Form 2</i>	47.4	50.7	52.4
School sex			
<i>Mixed-sex</i>	46.8	47.9	45.9
<i>Single-sex</i>	56.1	58.9	73.6
School category			
<i>Category A</i>	55.9	59.2	64.2
<i>Category B</i>	46.9	50.9	46.7
<i>Category C</i>	46.5	45.3	46.9
<i>Overall</i>	47.5	49.1	48.1

3.4.6 SEI students' performance in the different aspects of the reading literacy

As discussed in section 3.3.2, the reading assessment covers three subscales (text, cognitive process, and situation). The average scores for the reading literacy domains are provided in table 3.5 (table A3.4 disaggregates the data by region). Generally, the average scores have declined over the 2022 results except for "Personal" in the domain of "Situations." For both 2022 and 2023, students had a relatively low average score on "Argumentative", "Instruction," and "Narration" items within the text dimension. In 2023, students obtained a higher average score on the "Personal" items within the "Situations" dimension. As expected, students obtained higher average scores for questions with lower cognitive demand.

Table 3.5 Students' performance in different aspects of reading literacy (mean percent)

Domains	Survey 2022	Survey 2023
Text type		
<i>Description</i>	62.9	53.9
<i>Narration</i>	37.4	27.1
<i>Argumentative</i>	33.9	26.9
<i>Instruction</i>	47.3	38.5
Aspects/cognitive processes		
<i>Access and retrieve</i>	64.5	52.2
<i>Integrate and interpret</i>	47.5	43.3

Domains	Survey 2022	Survey 2023
<i>Reflect and evaluate</i>	40.5	35.8
Situations		
<i>Personal</i>	16.7	42.6
<i>Public</i>	57.7	48.2
Cognitive demand		
<i>Low</i>	64.2	52.3
<i>Medium</i>	42.6	39.9
<i>High</i>	42.7	36.0

Table 3.6 provides results on the multiple linear regression model output with students' scores in reading literacy as the dependent variable. The explanatory variables are the student and school demographic characteristics. As shown in table 3.6, Based on the coefficient of determination (22.8 percent); , less than one-quarter of the variations in students' reading scores can be explained by the regressors. Thus suggesting that the independent or demographic variables are not efficiently explaining the variations in students' scores for reading literacy. The findings indicate that compared with males, females obtain a 4.3 percent significantly higher score than males. Similarly, being in Form 2 increases a student's reading literacy score by 5.2 percent. However, compared with category A schools, category B and C students score significantly lower. The results further suggest that relative to students who study in the north belt (i.e., Northern, Upper East, Upper West, and Savannah regions), those who attend secondary schools in the south belt (i.e., Volta, Greater Accra, Central, Western, Eastern Regions) and middle belt (i.e., Ashanti, Bono, Ahafo, Bono East, Western and Northern regions) stand a chance to increase their reading scores significantly by 17.1 percent and 10.7 percent respectively.

Table 3.6 Output of multiple linear regression of reading skills assessment

Characteristics	Coefficient (Sig*)	95% confidence interval
Sex of student		
<i>Male</i>	Reference	
<i>Female</i>	4.3*	2.026, 6.498
Level of student		
<i>Form 1</i>	Reference	
<i>Form 2</i>	5.238*	3.015, 7.460
School category		
<i>Category A</i>	Reference	
<i>Category B</i>	-8.1*	-13.731, -2.424
<i>Category C</i>	-7.5*	-12.613, -2.401
Region		

Characteristics	Coefficient (Sig*)	95% confidence interval
<i>Northern belt</i>	Reference	
<i>Middle belt</i>	10.7*	7.507, 13.814
<i>Southern belt</i>	17.1*	14.109, 20.166
School sex		
<i>Single-sex</i>	23.8	18.785, 28.880
<i>Mixed-sex</i>	Reference	

3.4.7 Qualitative findings from teachers, students, heads of schools, and parents regarding students' performance on reading literacy assessment

3.4.7.1 Factors contributing to low proficiency levels in reading literacy in some regions and schools.

The qualitative survey sought to explain the factors attributed to low proficiency levels in the students' reading literacy assessment from some heads of schools, teachers, parents, and students. This section provides an in-depth discussion of factors such as parental neglect, weak foundational knowledge, students' negative attitudes, placement of underperforming students in category C schools, and the difficulties associated with managing a community day school that affect students' performance in reading literacy.

Parental neglect of children's educational needs

Over the years, through parent associations and meetings, parents and guardians have been identified as active participants in children's educational journey. Unfortunately, some parents do not yet appreciate the extent to which their involvement affects their children's education or their educational needs. The findings reveal that parents' attitude of being uneducated about the benefit of providing some learning materials and attending to some needs of students results in low concentration in class even as teaching and learning is ongoing. For instance, a female teacher in the Ashanti region said that, *"If a student comes to school and is troubled, no matter what you say, their concentration will not be in class because they are distracted. You know, students also go through stress. Parents are not supporting them financially. They need books and other things, and if the parents are unable to provide for them, it doesn't motivate them to learn."* These stresses tend to diminish students' motivation towards their education.

In addition to the above, the policy of Free SHS has created the impression in the minds of some parents that the government, through the policy, tends to address all the needs of students, hence

resulting in parents neglecting the needs of their wards in the guise that the policy was introduced to absorb all the educational needs of children. Another teacher said that, *"Now it is free SHS because the government will bring books. So if the child needs anything, because the parents think it is free they just leave their wards like that, and that doesn't help, and it's a challenge."* Among the many reasons for neglect is poverty, especially in families with large sizes. Here is what a male teacher in Ashanti Region had to share *"Well, the poverty level here is very high. And excuse me to say our culture is not so healthy enough. Where we still marry two or three wives, we have a lot of kids around. So, an adolescent in senior high school will be seen as an independent adult, so much interest is not put on them. Parents do not actually prioritize the education of their wards at the senior high school level."*

Weak basic-level knowledge and skills at the basic level

Some teachers attributed students' low performance in reading to their poor foundational knowledge. Teachers cited that some students can barely read while others struggle to identify two-letter words. Such students are likely to perform poorly in the assessment. As an explanation as to why gaps exist in students' foundational knowledge, some teachers opined that the change in teaching mode at the basic level, which requires one teacher to teach all subjects in a class, results in poor performance among students. Such teachers believe adopting the specialization method at the basic level is the best solution, enabling teachers to deliver their best in their area of specialization.

Teacher absenteeism at the basic level was also mentioned as a factor affecting lesson delivery at the basic level. To resolve challenges at the foundational level, a teacher in the Northern region suggested that there should be a platform for teachers at the basic level and those at the senior high level to discuss student developmental issues to bridge the gap on student performance from the basic level to senior high level. Such interactions will enable teachers to exchange concerns and derive possible remedies in resolving these challenges. As mentioned in his statement, *"I would encourage regular interactions with the basic level teachers so that we can channel some of the issues we are having at the senior high level to enable them to know how to tackle it from there."* Here are additional statements from teachers on students' weak foundational levels:

- *"Yes, reading is a problem. So once reading becomes a problem, you will find it difficult to adjust in all eight subjects and more, right? So, what we do is we have an initiative in the school where students are now tasked, I think every Monday, you come out to read."*
- *"So, if you see the kind of students we have, reading is a problem because of their background in education."*
- *"The challenges are more or less inherited from the junior high school level. Where some of them come from, they cannot even identify two-letter words. So, it has been very hectic for*

us. Most of them, I can say, are not qualified to write the BECE. But once they get to write it and come, you have nothing to do but to keep them in the system and manage them. So, it has been a big challenge. So, if we could get them to teach based on their specialization at that level, I know the current college system is helping where they try to specialize in certain courses.”

Negative attitude of students due to the perceived ineffectiveness of some teachers

Another factor contributing to low mastery of reading literacy is the negative attitude of some students toward teaching and learning. During the survey, it was realized that some students hardly pay attention in class due to the perception of students that since they own a copy of the textbook, they can learn and revise on their own, as indicated by a female student in the Bono region who said that *“I think the main reason why I have that problem is that I have the textbook and the teacher is also reading directly from the book. I feel like he is reading from the book so why not read on my own to get more understanding because he is not even explaining what he reads. He is just reading the same thing. And he will not say anything about it. So, I feel like let me learn on my own, and if I do not understand I will approach him.”* Such students believe their teachers hardly introduce new information outside what they know from the textbooks hence the reason for such attitude. The findings also reveal that, though some schools have inadequate teachers, even the few teachers available fail to maximize the time they have with students in class for lessons as they are noted to rather engage in disciplinary actions with each opportunity they have with the class.

The placement of poor-performing students in Category C schools

Some teachers and heads of schools in category C schools related the poor performance of their students in reading to the school placement system. They explained during the survey that the calibre of students placed in their schools were those who underperformed in the Basic education certificate examination (BECE)¹¹. This is evident in the response from a female English teacher in Upper West, *“Yes, I think the problem comes from the students. Because we take in, for lack of better words, low-quality students. If you check the Basic education certificate examination (BECE) results, the kind of students we get, are students with grades like 35.”* A teacher in the Northern region added that *“the performance in their BECE is very bad. I think for the English language, we don’t even get any of them coming with a grade of 6 or even 5, always either 8 or 9.”* Therefore, having such students in their schools explains low proficiency scores. In addition, one headmaster noted people’s negative perceptions of the categorization of schools. According to him, people perceive that students who

¹¹ The BECE is the main examination to qualify students for admission into secondary and vocational schools in Ghana and Nigeria. The grading range for each subject starts from 1 to 9. In assessing student’s grades, the best six subjects including English, mathematics and science are computed to determine the student’s qualification

attend a category C school are underperforming students, and as such, nothing good will come out of them. This negative mindset affects students and diminishes their zeal towards studying hard. Here is the headmaster's statement: *"I remember during one of my engagements within the locality and also the basic schools around, where I was trying to patronize the school to the community, some of the locals and even the students at the basic level told me that they prefer not to be in the school because it implies that you have failed. So, from that angle, it tells you that the general conclusion of the people around is that our students are failed students."*

Difficulties with managing community day schools affecting students' performance

Some teachers and headmasters in community day schools identified challenges they encounter in managing students' behavior. According to these respondents, although most of their students underperformed in the BECE, the school's strategies to help students have been ineffective due to the difficulty in managing students' behavior. Some teachers and headmasters further identified student truancy as one such behavior. Even though some measures could be implemented, the respondents fear that, with too much pressure, students will eventually fail to attend school. This fear deters teachers and headmasters from using disciplinary measures to address this menace. Here are some thoughts from several respondents:

- *"We try to introduce them to the International Phonetic Alphabet and the sounds of the letters. Because of the poor attendance, some of them do not like coming to school. They only come maybe twice in a week or maybe thrice in a week. And, in our situation, if you even put much pressure on them, some of them will drop out completely. So, we are left with just begging them to stay around."*
- *"In the day school, we are not able to put much pressure [on students] This because they are from the community. So, if they were in a boarding system, you could easily go around the dormitories. We keep roll-call and ... all those things, but we are not able to track them down since it is a day school."*
- *"Some students, just want to stay away from their parents. So, they come but they are not even regular in school. There was this attempt where some group of students tried to call themselves distance learners but I had to do everything to stop them. So I gave an ultimatum to the final-year students where they will be registered to write the West African Senior School Certificate Examination (WASSCE) only if they attended school for some specific number of days."*

3.4.7.2 Factors contributing to high proficiency levels in reading literacy in some regions and schools

Introduction of remedial sessions

The survey indicated that the introduction of remedial sessions has played a significant role in the improvement of student literacy in some schools. Through remedial sessions, teachers assist underperforming students in English through the identification of their challenges and directing attention to the mastery of such challenges. For instance, a student noted that *“There were some students who did not know how to speak English or write and the head of the school organized classes for them after school hours. I can see that now most of them are able to speak and write in English.”* In addition, remedial sessions provide an avenue for teachers to revisit topics and concepts that students had difficulty understanding. During remedial sessions, teachers take their time to teach until students can understand difficult topics within the allocated period. This intervention has harnessed improvement in students’ reading as realized in the assessment outcome. Here are responses from the interviews:

- *“Most of the students were weak in English. Since the introduction of the intervention classes the teachers take time and teach us to our understanding until every student gets the concept of that particular topic. I think it is helping. Now we are good and I can say most of the students are very good in the English language.”*
- *“I have seen the changes and improvements in our performance in the last academic year. Comparing the last two years’ West African Senior High Certificate Examination (WASSCE) to last year’s WASSCE, there has been a major improvement in it since the teachers employed a new intervention. We are able to cover up some uncompleted subjects and topics that we are not able to treat.”*
- *“So, I think with our English lessons, every Tuesday he organizes an extra class for us. He combines three classes. He can use his projector to project everything for us. And just recently, we were learning about sentences, and we watched a comedy about the way the teacher was able to define or explain to the students what a sentence is. So, through that, we got the concept of a sentence before he began the class. So, I think it has really helped to improve my English.”*
- *“When we are learning English in the regular class, the teacher will teach the topic and then will leave. But for the intervention, he has already placed us in groups. He gives us topics to learn about it. So, when he comes, we will do a presentation on it. This gives us the courage to stand in front of people to talk.”*

Designing intervention plan and effective monitoring by school management

In investigating the factors contributing to the improvement in reading literacy, the evaluation realized that team effort through collaboration among the teachers, students, and school management can yield positive results. At one school, improvement in student performance was possible through the introduction of an intervention plan by the school management. A teacher mentioned that in designing the intervention, the headmistress engaged teachers to outline challenges confronting students' performance. After the meeting, resource personnel from high-performing schools collaborated to exchange knowledge and technical support with the various departments to develop strategies to help improve student performance. The school management further engaged in monitoring activities, the application of discipline, encouragement, and motivation of students, and this resulted in the improvement in students' performance. As a teacher at the school observed: *"The headmistress, together with the management, came out with an intervention plan as to how we can help students achieve better academic performance. And then they had a meeting with all the teachers. They brought in resource people from other schools to help other departments in achieving this. And then they were also always on the students, motivating them and ensuring discipline in the school. And through that, teachers and students, together with the management, came together and it really helped. So, this is reflected in our last year's performance."*

Adopting effective teaching strategies and activities to meet student's needs

Teachers shared some effective teaching strategies they have adopted to address the needs of the students. A teacher realized that she was an Ewe teaching in a school in the Akan locality, so she always had to speak English with the students as she could barely speak the Fante language. This made her realize that she could use English conversations to help students learn English. She downloaded videos in English that students could use to practice their English. Another teacher stated her headmaster *"is always encouraging teachers to be dedicated to our work in bringing the best out of the students. So, I always have one-on-one sessions with underperforming students so I can assist them. Once I do that, I realize they start to pick up quickly."* Some teachers and headmasters attributed the high performance of students to certain extracurricular activities such as organizing debates, reading competitions, and writing competitions among the students. A female teacher mentioned that the head of her department had *"introduced some reading activities for the students, so sometimes we have the students moving to the school library... because we believe that a student's ability to read and understand English determines their ability to perform better in the other subject areas."* The extracurricular activities ignite students' interest in reading and ensure that learning occurs even as they are engaged in nonacademic activities. As a headmaster in the Northern region stated: *"We try to help the students build the concepts of the English language by organizing reading and debate competitions for the students."* A few teachers also mentioned that the school has a WhatsApp group that they use to share assignments and activities to help students during holidays.

3.5 Evaluation of mathematics literacy assessment

3.5.1 Mathematics literacy assessment

Competence in mathematics assists students in recognizing the role that mathematics plays in the world and in making well-founded judgments and decisions needed to be constructive, engaged, and reflective citizens.

3.5.2 The framework for assessing mathematics literacy

Mathematical literacy includes making mathematical deductions and applying mathematical concepts, procedures, facts, and tools to describe, explain and predict phenomena (please see the mathematics item framework attached as annex 1). Such literacy helps people to identify and understand the role that mathematics plays in the world and to make the well-founded judgments and decisions required in life.

The literacy framework for mathematics comprises four interrelated aspects:

- the content area in which tasks are embedded
- the contexts involved
- the competencies/processes used and
- the cognitive domain that students need to apply

Content areas:

The mathematics literacy framework classified content area as follows:

- Cover quantity
- Space and shape
- Change and relationships
- Uncertainty and data.

Contexts

The mathematics literacy framework identified context to include:

- Personal
- Occupational
- Societal and scientific.

Competencies/processes include:

- Formulating situations mathematically
- Employing mathematical concepts, facts, procedures, and reasoning

- Interpreting, applying, and evaluating mathematical outcomes

Cognitive domains:

- Low
- Medium
- High.

For both 2022 and 2023, the assessment of mathematics literacy items was identical and included 40 items, of which 36 were multiple choice and 4 were open-ended. Students were allowed 90 minutes to complete the assessment.

3.5.3 Proficiency levels for mathematics literacy

As discussed in previous sections, student performance in the assessments is reported on a scale. The scale is divided into levels of proficiency that indicate the kinds of tasks that students at those levels are capable of completing successfully. Table 3.7 illustrates the range of mathematics achievements covered by the LiT evaluation survey and describes the skills, knowledge, and understanding that are required at each level of the mathematics scale.

Table 3.7 Proficiency levels for mathematics literacy

Level of proficiency	Scores	Characteristics of tasks
Highly proficient	80 – 100%	Highly proficient students can conceptualise, generalise, and utilise information based on their investigations and modelling of complex problem situations, and can use their knowledge in relatively nonstandard contexts. They can link different information sources and representations together and flexibly translate among them. Students at this level are capable of advanced mathematical thinking and reasoning. These students can apply this insight and understanding, along with a

Level of proficiency	Scores	Characteristics of tasks
		<p>mastery of symbolic and formal mathematical operations and relationships including formal proofs, and to develop new approaches and strategies for attacking novel situations. Students at this level can reflect on their actions and can formulate and precisely communicate their actions and reflections about arguments and the appropriateness of these to the original situation through high level mathematization.</p>
Proficient	68 - 79%	<p>At this level, students can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare, and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models.</p> <p>Students at the proficient level can work strategically using broad, well-developed thinking and reasoning skills, appropriately linked representations, symbolic and formal characterisations, and insight pertaining to these situations. Students at the proficient level have begun to develop the ability to reflect on their work and to communicate conclusions and interpretations in written form.</p>

Level of proficiency	Scores	Characteristics of tasks
Approaching proficiency	54 - 67%	Approaching proficiency students can execute clearly described procedures, including those that require sequential decisions. Their interpretations are sufficiently sound to be a base for building a simple model or for selecting and applying simple problem-solving strategies. Students at this level can interpret and use representations based on different information sources and reason directly from them. They typically show some ability to handle percentages, fractions, and decimal numbers and to work with proportional relationships. Their solutions reflect that they have engaged in basic interpretation and reasoning.
Developing	40-53%	Developing students can interpret and recognise situations in contexts that require no more than direct inference. They can extract relevant information from a single source and make use of a single representational mode. Students at this level can employ basic algorithms, formulae, procedures, or conventions to solve problems involving whole numbers. They are capable of making literal interpretations of results.
Emerging	39% and below	Few emerging students can demonstrate the ability and initiative to use mathematics in simple-life situations. These

Level of proficiency	Scores	Characteristics of tasks
		students may not be able to make meaningful connections between mathematical concepts.

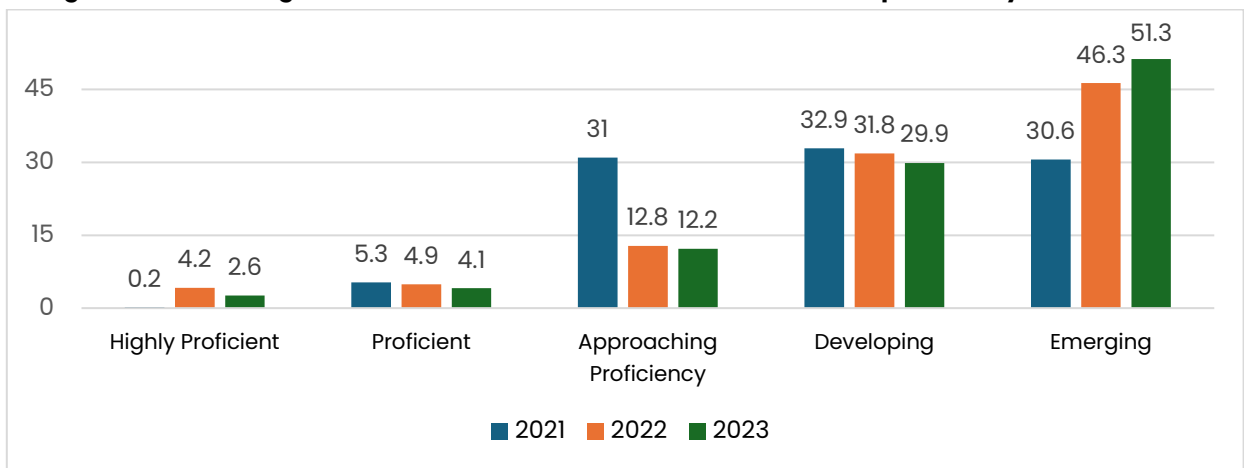
3.5.4 How students performed in mathematics literacy

Figure 3.8 shows the proportion of students approaching proficiency or higher in mathematics literacy dropped slightly from 21.9 percent in 2022 to 18.9 percent in 2023, on average, across the 100 sampled schools ([table 3.8](#)). According to NaCCA, the minimum qualifying proficiency level in mathematics literacy for secondary school students is “approaching proficiency.” At the minimum, students at this level can execute clearly described procedures, including those that require sequential decisions. They can also interpret and use representations based on different information sources and reason directly from them. Across the 100 sampled schools, 13 of the 100 schools had at least 50 percent of their students approaching proficiency or higher. ([table A3.7](#)).

In three schools, at least 8 of 10 of their students were top performers in mathematics literacy (i.e., students who were proficient or higher); these schools include Notre Dame Seminary SHS (100 percent), Notre Dame Girls SHS (83.3 percent) and Kwahu Tafo SHS (83.3 percent). The top-performing students from these schools can model complex situations mathematically and select, compare, and evaluate appropriate problem-solving strategies for dealing with them. The top three schools with top-performing students were category A and single-sex schools.

The share of emerging students in mathematics literacy rose slightly from 46.3 percent in 2022 to 51.3 percent in 2023. Six schools had no emerging students in mathematics literacy.

Figure 3.3 Percentage of students at different levels of mathematics proficiency – overall result



NOTE: Figures may not sum up to 100% due to rounding.

3.5.5 SEI students' attainment of the different proficiency levels in mathematics literacy

Highly proficient

Highly proficient students can conceptualize, generalize, and utilize information based on their investigations and modelling of complex problem situations and can use their knowledge in relatively nonstandard contexts. They can link different information sources and representations together and flexibly translate among them. Students at this level are capable of advanced mathematical thinking and reasoning.¹²

Relative to 2022, on average, 2.6 percent of students were highly proficient in mathematics literacy in 2023 ([table 3.8](#)). Apart from Notre Dame Seminary SHS where over 80 percent of their students attained high proficiency in mathematics literacy, 14 schools had at least one student attaining this level of proficiency ([table A3.7](#)).

Proficient

Proficient students can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare, and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at the proficient level can work strategically using broad, well-developed thinking and reasoning skills, appropriately linked representations, symbolic and formal characterizations, and insight pertaining to these situations.

Across the 100 sampled schools, a similar proportion of students were proficient in 2023 (4.1 percent) compared to 2022 (4.9 percent). Category A and single-sex schools not only have the greatest percentage of students performing at proficient levels in mathematics literacy, but they also recorded an increment in the proportion of proficient students in 2023 than in 2022 ([table 3.8](#)). The Eastern Region (8.3 percent) recorded the highest share of proficient students in mathematics in 2023, while the Central region recorded the highest (12.1 percent) in 2022.

Approaching proficiency

Students approaching proficiency can execute clearly described procedures, including those that require sequential decisions. Their interpretations are sufficiently sound to be a base for building a

¹² The disaggregated data for regions and schools can be found in [tables A3.5](#) and [A3.6](#) in annex 3.

simple model or for selecting and applying simple problem-solving strategies. Students at this level can interpret and use representations based on different information sources and reason directly from them.

Across the 100 sampled schools, a similar proportion of students in 2022 (12.8 percent) and in 2023 (12.2 percent) were approaching proficiency in mathematics. In both years, more students in category A and single-sex schools were approaching proficiency in mathematics literacy compared with other school categories and mixed-sex schools. [Tables A3.6](#) and [A3.7](#) disaggregate the data by region and school. The Bono (21.4 percent), Oti (19.4 percent), and Central (17.4 percent) regions recorded the highest number of students approaching proficiency in mathematics literacy.

Developing

Developing students can interpret and recognize situations in contexts that require no more than direct inference. They can extract relevant information from a single source and make use of a single representational mode. Students at this level can employ basic algorithms, formulae, procedures, or conventions to solve problems involving whole numbers. They are capable of making literal interpretations of results.

Less than a third of the students were developing proficiency in mathematics literacy in 2023 compared with 31.8 percent in 2022. Fifteen schools had at least half of their students at this level of proficiency in mathematics. The two schools with the highest proportion of students who were developing proficiency in mathematics literacy were Kete Krachi Senior High/Tech. (66.7 percent) and Bonzo-Kaku SHS (58.3 percent) ([table A3.7](#)). Close to 4 of 10 students in the Central region and 3 of 10 students in the Volta, Savannah, Western North and Greater Accra regions attained this level ([table A3.7](#) and [table A3.6](#)).

Emerging

Few emerging students can demonstrate the ability and initiative to use mathematics in simple situations. These students are unlikely to be able to make meaningful connections between mathematical concepts.

For every 10 students, 5 were emerging in mathematics literacy in 2023; this is higher than in 2022. Female students, Form 1 students, and students in mixed-sex schools had higher numbers of emerging students in mathematics across the 100 sampled schools ([table 3.8](#)). Also, more than half of category B and category C students were emerging in mathematics literacy compared with those in category A schools (21.4 percent) ([table 3.8](#)). The results further showed that more than 70 percent of students in 27 schools were emerging in 2023 ([table A3.7](#)). Students who were emerging in mathematics literacy were dominant in North East (83 percent), Upper West (68.8 percent), and Ahafo (66.7 percent) regions.

Table 3.8 Percentage of students at different levels of mathematics literacy

Assessments	Highly Proficient (80–100%)			Proficient (68–79%)			Approaching Proficiency (54–67%)			Developing (40–53%)			Emerging (0–39%)		
	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023
Sex															
<i>Male</i>	0.2	5.8	4.5	5.7	6.0	5.9	31.8	16.1	12.4	34.9	31.6	30.3	27.5	40.5	46.9*
<i>Female</i>	0.2	2.5	0.8*	4.8	3.9	2.4	30.3	9.5	12.1	30.8	31.9	29.5	34.0	52.2	55.3
Level of student															
<i>Form 1</i>	0.2	2.5	1.7	4.3	3.5	3.8	31.4	9.6	9.3	31.8	32.6	27.1	32.3	51.8	58.2
<i>Form 2</i>	0.2	5.8	3.4*	6.1	6.3	4.4	30.7	16.0	15.0	33.9	31.0	32.5	29.1	41.0	44.8
School category															
<i>Category A</i>	0.0	11.8	22.6*	9.0	10.1	9.5	35.3	19.5	21.4	28.7	30.2	25.0	27.1	28.4	21.4
<i>Category B</i>	0.6	2.7	1.1	5.2	5.1	4.7	30.8	12.4	14.0	31.7	35.8	25.5*	31.7	44.1	54.7
<i>Category C</i>	0.0	3.1	1.1	4.6	3.4	3.3	30.5	11.3	10.7	34.2	29.5	31.8	30.7	52.8	53.1
School sex															
<i>Mixed-sex school</i>	0.2	5.4	1.3	5.0	9.3	3.6*	31.4	18.6	10.9*	33.1	25.6	30.3	30.4	41.1	53.9
<i>Single-sex school</i>	0.0	11.6	17.7	8.4	10.9	9.4	27.7	22.5	27.1	30.1	26.4	25.0	33.7	28.7	20.8
Overall	0.2	4.2	2.6*	5.3	4.9	4.1	31.0	12.8	12.2	32.9	31.8	30.0	30.6	46.3	51.3*

*p<0.05

NOTE: Figures may not add up to 100% due to rounding

Table 3.9 Students’ mean assessment scores in mathematics literacy by demographic characteristics (%)

	Survey 2021	Survey 2022	Survey 2023
Sex			
<i>Male</i>	47.9	46.3	43.7
<i>Female</i>	46.2	41.3	39.8
Level of student			
<i>Form 1</i>	46.8	41.3	39.9
<i>Form 2</i>	47.4	46.3	43.3
School sex			
<i>Mixed-sex</i>	47.1	42.7	40.3
<i>Single-sex</i>	46.9	52.8	57.4
School category			
<i>Category A</i>	48.9	52.2	58.1*
<i>Category B</i>	47.1	43.7	40.3
<i>Category C</i>	46.8	41.6	40.5
<i>overall</i>	47.1	43.8	41.7

*p≤0.05

3.5.6 SEI students’ performance in the different aspects of the mathematics literacy

The results of the item analysis within the domains of the mathematics literacy assessment are summarized in table 3.10. Generally, students’ scores in mathematics content areas are low. There were no variations between the 2022 and 2023 scores obtained in “Quantity”, “Space and shape”, and “Uncertainty and data” within the content area. However, there was a slight decline in students’ scores for “Change and relationship” from 51.2 percent in 2022 to 48.2 percent in 2023. Students obtained lower scores as the “cognitive” demand increased compared with items with low “cognitive” demand. Less than half of students were able to formulate situations mathematically and employ mathematical concepts, facts, procedures, and reasoning in both 2022 and 2023. These are key areas that teachers need to focus on when teaching mathematics to SEI students (see table 3.10). The same is noted when the data were disaggregated by region. However, in about eight schools, including Notre Dame Seminary , Notre Dame Girls Senior High, and St. Charles Senior High, more than half of the students were able to formulate situations mathematically and employ mathematical concepts, facts, procedures, and reasoning ([table A3.9](#)).

Table 3.10 Students’ performance in different aspects of mathematics literacy (mean percent)

	Overall	
	Survey 2022	Survey 2023

Content area		
<i>Quantity</i>	35.4	35.7
<i>Space and shape</i>	45.7	45.8
<i>Change and relationship</i>	51.7	48.2
<i>Uncertainty and data</i>	44.6	45.8
Competencies/processes		
<i>Formulating situations mathematically</i>	37.3	36.4
<i>Employing mathematical concepts, facts, procedures, and reasoning</i>	32.0	33.1
<i>Interpreting, applying, and evaluating mathematical outcomes</i>	54.1	52.0
Cognitive domain		
<i>Low</i>	55.7	53.4
<i>Medium</i>	31.2	30.1
<i>High</i>	28.0	29.1

Table 3.11 provides data on the output of a multiple linear regression model in which students' scores in mathematics literacy were used as the dependent variable and the independent variables were student and school demographic characteristics. The variations in students' scores for mathematics literacy are not efficiently explained by the regressors in the models considering the coefficient of determination (18.7 percent). Per the results in table 3.11, female students obtained 4.9 percent lower scores compared with male students. Form 2 students also obtained 3.8 percent higher scores compared with Form 1 students. Relative to students in categories A schools, those in category B and category C obtained 8.8 and 8.7 percent lower scores. Additionally, students in schools within the middle belt, southern belt and those in single-sex schools tend to have higher percentage scores in mathematics than their peers in the northern belt, and mixed-sex schools.

Table 3.11 Output of multiple linear regression of mathematics literacy assessment

Characteristics	Coefficient (Sig*)	95% confidence interval
Sex of student		
<i>Male</i>	Reference	
<i>Female</i>	-4.9*	-6.291, -3.509

Characteristics	Coefficient (Sig*)	95% confidence interval
Level of student		
<i>Form 1</i>	Reference	
<i>Form 2</i>	3.8*	2.315, 5.215
School category		
<i>Category A</i>	Reference	
<i>Category B</i>	-8.8	-12.314, -5.278
<i>Category C</i>	-8.7	-11.886, -5.495
Region		
<i>Northern belt</i>	Reference	
<i>Middle belt</i>	0.4	-1.578, 2.365
<i>Southern belt</i>	4.0	2.167, 5.931
School sex		
<i>Mixed-sex</i>	Reference	
<i>Single-sex</i>	12.0	8.819, 15.134

*p≤0.05

3.5.7 Qualitative findings regarding students' performance on mathematics literacy assessment

3.5.7.1 Factors contributing to low proficiency levels in mathematics literacy in some regions and schools

A shortfall in instructional resources

Teaching and learning resources are devices and materials that facilitate the transmission of knowledge to students. Some teaching and learning resources serve as materials that enable students to have physical contact with the concept or topic being taught, ensuring that teaching and learning do not take place in abstract form to the students. Therefore, the absence and inadequacy of such resources during teaching and learning can have dire consequences on students' ability to absorb certain concepts, translating into students' low performance, as noted in the assessment. The issue of inadequate or lack of teaching and learning resources was emphasized in the qualitative interviews. A teacher in Notre Dame Girls SHS had this to say on instructional resource constraints *"I must emphasize that there are a lot of things we need to have integrated into the teaching and learning but sometimes due to resource constraints, you are unable to implement exactly what you are teaching. For example, I teach mathematics. And so, in my lesson delivery, I sometimes incorporate ICT into it. How do I do that? If I want to teach something like Venn diagrams. You could have a video of a Venn diagram displaying all the regions, naming all the regions. The students can go through and have that visual representation of the Venn diagram... Then, you can now go ahead*

to introduce the topic to them. You see, learning, as we say, will not only be theoretical, but as the person visualizes what is happening, reading what is happening, then its text concretizes in the person's mind. There are several aspects of mathematics we could have integrated ICT. And so, sometimes due to the lack of projectors, even personal laptops in the classrooms have been a problem. Even common power, power in the classroom is a problem." Another teacher mentioned that "Students also do not have the necessary tools or mathematical equipment to learn, such as working calculators, mathematical sets. So, it is very difficult to help them to pick up the concepts very fast." Sometimes, we wish we could project some abstract concepts for them using the computer for the students to see how certain diagrams or graph work are sketched, but we do not have a projector in the school, and this affects their ability to understand some of these concepts."

Perceived weak teaching qualities and the biased nature of some teachers

Another factor accounting for the poor performance in mathematics literacy is the weak teaching quality of some mathematics teachers, as indicated by some students during FGDs. For instance, a student in the Eastern region noted that *"there was this madam in our school, she made me not even like math because anytime she came into the class, she would pick some particular students that are good then she concentrates more on them and forgets about the others. Once she asks a question and we are unable to solve it, she would quickly direct it to the person, for instance, saying have you solved it? Yes, madam, I have gotten it right [the "chosen" student]. Okay, let us move on. She then forgets about the whole class, which caused me not to have that kind of love for the subject."*

Though the GES, the NTC and other nongovernmental organizations have introduced several programs and policies, including Professional learning communities (PLCs), to address the aforementioned challenge, the weak teaching qualities of some teachers remain a concern to some students. These students attributed their poor performance in mathematics to their diminished interest in the subject due to the approach some teachers adopt during lesson delivery. An example is what was said by a student in the Ashanti region: *"Sir, just like the JHS, BODMAS¹³ in mathematics. I was not doing well because the teacher lectured us. He does the same thing when he leaves and comes the next day. He hardly gives us anything new to do, so it made me hate mathematics."* According to the findings, teachers who direct their attention to only a few good students in class end up discouraging the rest of the class from actively participating in the lesson, resulting in their low performance in mathematics. In addition, some students also raised concerns about teachers who adopt the lecture method during lesson delivery. The qualitative findings suggest that, with this approach, students are left out and disengaged as lessons are delivered. This creates a lack of

¹³ BODMAS rule is an acronym that is used to remember the order of operations to be followed while solving expressions in mathematics. BODMAS stands for B - Brackets, O - Order of powers or roots, (in some cases, 'of'), D - Division, M - Multiplication A - Addition, and S - Subtraction

interest, translating into poor performance in mathematics literacy. Here is what a teacher in Upper West shared during an interview *“If you are the type who comes to class and goes straight to the point, without interacting with the students on a personal level, you will make them uncomfortable to open up to you on their challenges but when you encourage them to open up, it makes them comfortable to share the problems so we can address those problems.”*

Insufficient number of teachers in schools

Furthermore, the deployment of few teachers in some schools came out as a factor contributing to students' poor performance in mathematics. In understanding how this affects students' performance, the analysis shows that a few teachers are overburdened in attending and teaching several classes due to the shortfall of teachers in some schools. As such, if the timetable demands the teacher to be in two classes within a period, the teacher is compelled to spend half a period with each class to ensure he or she has visited both classes as depicted on the timetable. This is further reinforced by the statement of a student. He said that: *“We lack teachers. And it is true because I am an art student and sometimes when we have math or science, some other form 1s or form 1s also have math and science and we are using the same teachers. So, you might go and call the teacher and the teacher will tell you “I have class in form 1, and I am in form 1 class, so let me spend 30 minutes with the form 1s and spend 30 minutes with the form 2s. While if he had used the 30 minutes that he spent in the form 1 to teach our class, he would have taught something new for us to add to our knowledge.”*

A weak foundation in the subject

Another concern raised by some teachers on why students underperform is their weak foundation in the subject. Most teachers mentioned during the survey that they realized that some of the underperforming students had either forgotten all that they were taught at the basic level or had a weak foundation. They usually make this observation when students report as first-year students to the school. Due to this challenge, teachers are forced to bridge these essential basic knowledge gaps (taking longer time) before proceeding with their substantive topics in the syllables.

- *“Most students did not get a good foundation in the subject and because their foundation in mathematics is weak, picking up is a challenge.”*
- *“Most of the topics we treat at the senior high school level are a continuation from basic schoole. Since they have already studied some of the topics right from the upper primary to junior high school (JHS) before coming to the senior high school, our task is to build on those foundations they have laid at that level and then continue from there. But since the foundation is weak, what can we do.”*

- *“Sometimes we introduce these concepts and topics to them, and it is like most of them cannot remember what they have learned at the basic level. I do not know if staying at home waiting for their result makes them forget all that they learned before coming to school.”*
- *Most students after completing school at the JHS level, do not have remedial sessions or extra classes to go so they forget what they learned before transitioning to the senior high.”*

Lack of parental support and cooperation

Concerning factors affecting students' performance in mathematics, some teachers believe that, for a student to be able to grasp a topic introduced to the students in class, the students have to work on several examples at home or outside class hours to be able to sustain the knowledge gained on the topics in mathematics. However, most students in community day schools cannot do so because, after school, they are expected to perform certain household chores, making it difficult for students to practice lessons taught at home. A teacher stated that *“the moment students leave the school until the next day or the next school day, they will not have time to study at home, to practice what was taught in class. Some students have household chores to perform, especially at a day school. After school, you will find only a few of them coming back to the school to learn or some of them studying at home.”* Also, due to the traditional mindset where a family is seen as honored due to the number of children in the home and men who have married many wives, the parents' attention gradually turns away from the adolescent children in the home, leaving them to fend for themselves and their needs. Here is a response from a teacher in the Northern region: *“One thing about those of us in the North is that we still have that traditional mindset on having large families being an honorable deed. So, we marry two or more wives and give birth to many children. In the end, we are unable to look after all of these kids, so the grown-ups ‘adolescents in senior high’” have to fend for themselves.”*

Poor classroom environment

Another factor contributing to students' inability to perform better in mathematics literacy is the overcrowded state of classrooms and the inadequacy of chairs and tables in some schools. According to some teachers, an overcrowded class affects the quality of lessons delivered in a mathematics class. A teacher's movement is restricted, making it difficult to observe students. On that, a teacher observed that: *“you give them an assignment, group work or individual tasks to perform, you need to move around to ensure that Mr. A or Mr. B is doing it right, and if Mr. A or Mr. B is not doing it right, how can you help them if the classroom is congested and you have like 60 or 70 students stuck in a classroom, you cannot attend to most of them, you might just stand here and say, okay, what is your problem? If he is not comfortable enough talking to you in the class or among*

his colleagues, that means you cannot attend to him personally, but if there is enough space in the classroom, you will be able to do that, and it is all because of the classroom size."

Another teacher also stated that *"When you go to some schools, they do not even have good furniture to sit on. How do you expect students to concentrate? In other schools, their classroom ventilation is very poor. And to be sincere, where we are, up north, the weather around March is terrible, even the master standing in class sweats. So, if the environment is also not conducive or accommodating, students' concentration will be very poor."*

3.5.7.2 Factors contributing to high proficiency levels in mathematics literacy in some regions and schools

High level of discipline in both teachers and students

To understand the factors contributing to high mastery levels of students in the mathematics assessment, some teachers and headmasters mentioned the impact of a collaborative effort between school management and parent association in ensuring discipline in the school. In ensuring that there is discipline among students, the parent associations are consulted by the school management on strategies the school intends to adopt, and these enable the parents to play their role effectively. A teacher cited that *"In our school discipline is the reason why we are amongst the top schools in Ghana. Lessons for the term begin immediately the day after students report to school and parents always do their part to make sure the wards are in school as expected."* As a headmaster added, *"We think that character formation should even be first. So, for us, you either become disciplined and you respect our rules and regulations, or you are not our student. So, if students are disciplined, it reflects in the performance."* In addition, teachers are encouraged to be punctual and present for lessons always. Teachers are held accountable and responsible for the performance of their students, so they tend to be disciplined in their conduct toward the performance of their duties. A comment from a teacher highlights this situation: *"When a teacher is first posted to our school, the teacher will be given a particular class to handle from first year to completion. So, with this, you the teacher will know that whether the students performed well or not in your subject, you are solely responsible, and this keeps teachers on their toes to deliver their best."*

Introduction of remedial sessions

Remedial sessions, popularly known as "intervention classes," tend to have an impact on the students' performance. This is because it affords students an opportunity for extended contact hours for clarification on lessons they did not understand during lesson delivery. Teachers usually have an extra hour to go over the lesson again at a slower pace providing students with another opportunity to revisit topics. Here is what a student shared during the interview: *"I can say there has been an*

improvement in our academic performance since last year because most of our classmates were performing very poorly in mathematics. The introduction of intervention classes, which is done every hour after class to focus on our weaker subjects, has helped us grab the concept of most topics that we found very difficult to understand in class. So basically, there have been academic improvements in our class."

High competency among teachers

Interviews revealed that teachers are now able to identify the weak areas of students through teachers' participation in PLCs. Therefore, with this understanding of students' challenges, Teachers develop strategies that help students and direct their attention to topics that need more attention. This leads to an improvement in their performance. Some teachers also believe that each school should be able to adopt a strategy that works for their students, as every school has its peculiar students and their challenges. A teacher shared his thoughts with the research team: *"We know our students. Instead of rushing to solve any questions, we try to give them practical things. We break it down. and always assume that they have never been taught mathematics before. And we do not always rush to finish syllabus. We teach them what they are supposed to know based on their ability."*

3.6 Evaluation of science literacy assessment

3.6.1 Science literacy assessment

The assessment of science literacy measured students' ability to engage with science-related issues and with the ideas of science as reflective citizens (please see item framework for science literacy attached as annex 1). Engaging in reasoned discourse about science and science-based technology requires a sound knowledge of facts and theories to explain phenomena scientifically. Such discourse also requires knowledge of the standard methodological procedures used in science and knowledge of the reasons and ideas that scientists use to justify their claims, to evaluate (or design) scientific enquiry, and to interpret evidence scientifically.

3.6.2 The framework for assessing science literacy

Scientific literacy is defined as the knowledge and understanding of the content of science, the procedures or methods of designing and evaluating a scientific enquiry, and the rationale behind the usual practices and fundamental terms in scientific enquiry.

Three scientific competencies underpin scientific literacy: (a) the ability to explain phenomena scientifically; (b) the ability to design and evaluate scientific enquiry; and, (c) the ability to interpret data and evidence scientifically within a range of personal, local, national, and global contexts. The assessment framework for science includes three subdomains:

- The contexts in which tasks are embedded
- The competencies that students need to apply
- The knowledge domains involved

Contexts

- Personal (self, family, and peer groups)
- Local
- National
- Global (life across the world) in health, natural resources, the environment, hazards and the frontiers of science and technology

Competencies

- Identify scientifically oriented issues
- Explain phenomena scientifically
- Use scientific evidence

Knowledge domain

- Knowledge of content of science (physical systems, living systems, technology systems and earth and space science),
- Knowledge about science: scientific Inquiry and scientific explanations

Cognitive demand

- Low - Recall a fact, term, principle, or concept or locate a single point of information from a graph or table. Merely requires the recollection of one piece of information and requires low cognitive demands, even if the knowledge itself might be complex.
- Medium - Use and apply conceptual knowledge to describe or explain phenomena, select appropriate procedures involving two or more steps, organize and display data, and interpret or use simple data sets or graphs. Requires the recollection of more than one piece of information and requires a comparison.
- High - Analyse complex information or data, synthesize or evaluate evidence, justify reasons based on various sources, and develop a plan or sequence of steps to approach a problem.

The science literacy assessment contains 40 questions items developed by NaCCA. Thirty-four of the items were multiple choice, and six were open-ended. Students were allowed 60 minutes to complete the assessment.

3.6.3 Proficiency levels for science literacy

Students' performance in science literacy is reported as a score on a scale and also as mean scores. To help interpret what students' scores mean in substantive terms, the scale is divided into proficiency levels (based on work done by NaCCA, see annex 1) that indicate the kinds of tasks that students at those levels are capable of completing successfully. Table 3.12 illustrates the range of proficiency levels for science literacy and describes the skills, knowledge, and understanding that are required at each level of proficiency.

Table 3.12 Proficiency levels for science literacy assessment

Level of proficiency	Lower score limit	Characteristics of tasks
Highly proficient	80 - 100%	Highly proficient students can draw on a range of interrelated scientific ideas and concepts from the physical, life, and earth and space sciences and use content, procedural and epistemic knowledge to offer explanatory hypotheses of novel scientific phenomena, events, and processes or to make predictions. In interpreting data and evidence, these students are able to discriminate between relevant and irrelevant information and can draw on knowledge external to the normal school curriculum. They can distinguish between arguments that are based on scientific evidence and theory and those based on other considerations.
Proficient	68 - 79%	At this level, students can use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events and processes involving multiple causal links. These students are able to apply sophisticated epistemic knowledge to evaluate alternative experimental designs and justify their choices and use theoretical knowledge to interpret information or make predictions. Proficient-level students can evaluate ways of exploring a given question scientifically and identify limitations of data sets, including sources and the effects of

Level of proficiency	Lower score limit	Characteristics of tasks
		uncertainty in scientific data.
Approaching proficiency	54 - 67%	At the approaching proficiency level students can draw on moderately complex content knowledge to identify or construct explanations of familiar phenomena. In less familiar or more complex situations, students can construct explanations with relevant cueing or support. They can draw on elements of procedural or epistemic knowledge to conduct a simple experiment in a constrained context.
Developing	40 - 53%	Developing students are able to draw on everyday content knowledge and basic procedural knowledge to identify an appropriate scientific explanation, interpret data and identify the question being addressed in a simple experimental design. They can use basic or everyday scientific knowledge to identify a valid conclusion from a simple data set. Developing students demonstrate basic epistemic knowledge by being able to identify questions that can be investigated scientifically.
Emerging	39% and below	Students are unlikely to use basic or everyday scientific knowledge to recognise aspects of familiar or simple phenomena. They might not be able to identify simple patterns scientific terms and follow explicit instructions to conduct a scientific procedure.

3.6.4 How students performed in science literacy

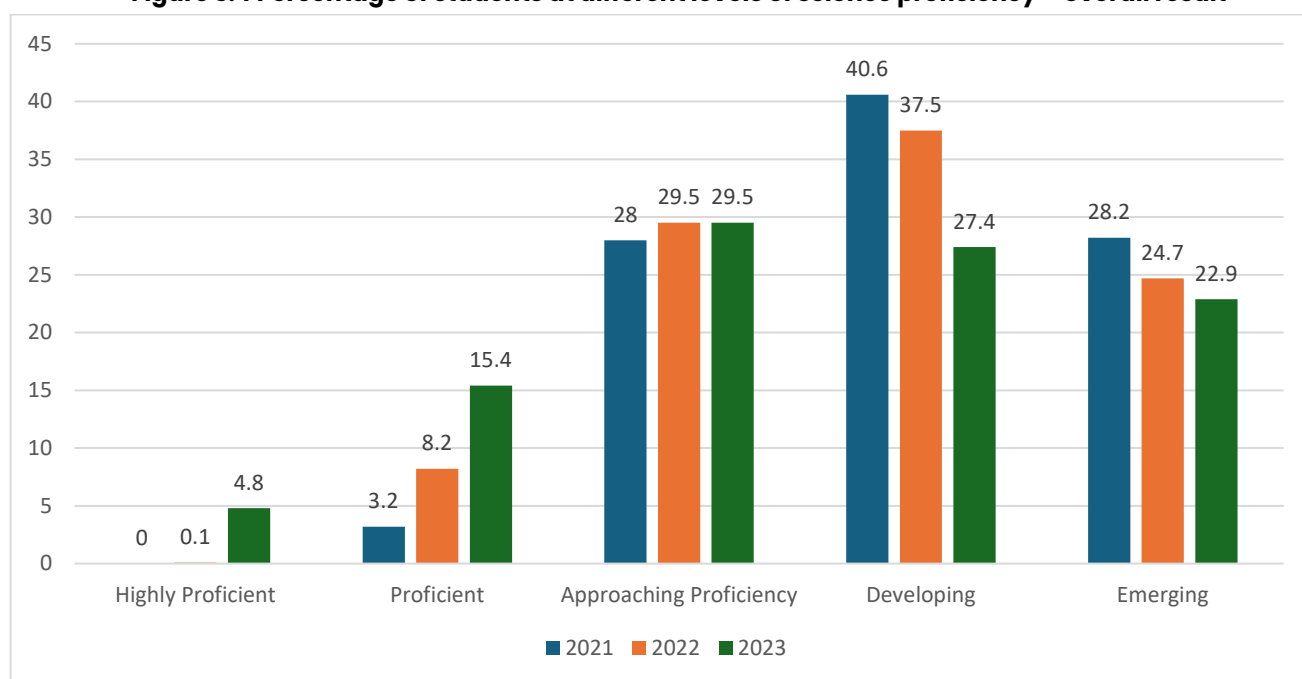
Students across the 100 sampled schools did better in science literacy from 2022 to 2023. About three in 10 students were approaching proficiency in science literacy. This proficiency level is NaCCA's minimum acceptable level of proficiency in science literacy. Students at this level of proficiency in science can draw on moderately complex content knowledge to identify or construct explanations of

familiar phenomena. They can construct explanations with relevant cueing or support in less familiar or more complex situations. The highest proportion of students approaching proficiency in science literacy was in the Volta (43.1 percent) and Western (36.1 percent) regions ([table A3.10](#)). At least half of the students in 16 of the 100 sampled schools were approaching proficiency in science in 2023. St. Ann's Girls Senior High (75.0 percent) and Presby Senior High/Technical, Kwamang (72.7 percent) had the highest results at this level of proficiency.

Compared with 2022 (8.3 percent), about 20.2 percent of students in 2023 were top performers (proficient and above) in science literacy. This depicts a sharp rise in the proportion of top performers, which is encouraging. These top-performing science students, at the minimum, can use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events, and processes involving multiple causal links. Greater Accra region (33.3 percent) recorded the highest proportion of top performers in science literacy in 2023, followed by the Northern region (28.2 percent) ([table A3.10](#)). More than half of the students in seven schools were top performers in science literacy. Specifically, at least 8 in 10 students in Notre Dame Sem/Seminary SHS (91.7 percent), St. Charles SHS (83.3 percent), and Nyinahin Catholic SHS (83.3 percent) were either proficient or highly proficient in science literacy in 2023 ([table A3.10](#) in annex 3). In contrast, there were no top performers in science in 24 schools; addressing this situation could be one of LIT's priority intervention areas.

The share of developing and emerging students in science literacy dipped in 2023 compared with 2022, further demonstrating the progression of students into higher proficiency levels in science literacy in 2023. The results indicate that about 2 in 10 students were developing proficiency in science.

Figure 3.4 Percentage of students at different levels of science proficiency – overall result



3.6.5 SEI students' attainment of the different proficiency levels in science literacy

Table 3.13 details the distribution of students across the five proficiency levels in science literacy.

Highly proficient

Highly proficient students can draw on a range of interrelated scientific ideas and concepts from the physical, life and earth and space sciences and use content, procedural to offer explanatory hypotheses of novel scientific phenomena, events, and processes or to make predictions. In interpreting data and evidence, these students can discriminate between relevant and irrelevant information and draw on knowledge external to the normal school curriculum.¹⁴

Unlike 2022 (0.1 percent), close to 5 percent of the students across the 100 sampled schools were highly proficient in science literacy in 2023. The increase in the share of highly proficient students in science was most pronounced in category A and single-sex schools, where about a quarter of the students attained this level of proficiency. At least one in three students in Diaspora Girls SHS (33.3 percent), Notre Dame Girls SHS (41.7 percent), St. Charles SHS (41.7 percent), and Notre Dame Seminary SHS (75.0 percent) were highly proficiently in science literacy in 2023 ([table A3.11](#)).

Proficient

Proficient students can use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events, and processes involving multiple causal links. These students can apply sophisticated knowledge to evaluate alternative experimental designs and, justify their choices and use theoretical knowledge to interpret information or make predictions.

The results further show a rise in the proportion of students who were proficient in science literacy in 2023 (15.4 percent) compared with 2022 (8.2 percent) ([table 3.13](#)). Males, Form 2s, category A students, and single-sex school students were more likely to be proficient in science literacy than the corresponding groups, such as females and category B and C schools. The school with the highest share of students being proficient in science literacy was Nyinahin Catholic SHS (83.3 percent), followed by Brakwa SHS (50.0 percent) and Diaso SHS (50.0 percent) ([table A3.11](#)).

Approaching proficiency

Students approaching proficiency in science literacy can draw on moderately complex content knowledge to identify or construct explanations of familiar phenomena. Students can construct

¹⁴ The school-level and regional-level data can be found in [tables A3.10](#) and [A3.11](#) in annex 3.

explanations with relevant cueing or support in less familiar or more complex situations. They can draw on elements of procedural or epistemic knowledge to conduct a simple experiment in a constrained context.

For every ten students, three were approaching proficiency in both 2022 and 2023 (table 3.13). Category B schools had the highest share of students approaching proficiency in science literacy in 2023. St. An's Ann's Girls SHS (75.0 percent) recorded the largest proportion of students who were approaching proficiency in science literacy.

Developing

Developing students are able to draw on everyday content knowledge and basic procedural knowledge to identify an appropriate scientific explanation, interpret data and identify the question being addressed in a simple experimental design. They can use basic or everyday scientific knowledge to identify a valid conclusion from a simple data set.

The proportion of students developing proficiency in science dropped 10.1 percentage points between 2022 and 2023. This decrease is positive because it reflects an increase in the share of students achieving higher proficiency levels in science literacy. In twelve of the sampled schools, a minimum of half their students were developing proficiency in science literacy in 2023. Bosomtwe Oyoko Community Day School recorded the highest percentage of students performing at this level in 2023 ([table A3.10](#)).

Emerging

There is a slight decrease in the share of students emerging in science literacy, from 24.7 percent in 2022 to 22.9 percent in 2023 (table 3.13). These students are unlikely to use basic or everyday scientific knowledge to recognize aspects of familiar or simple phenomena. They might not be able to identify simple patterns in scientific terms and follow explicit instructions to conduct a scientific procedure. The results are promising. They demonstrate progress and a shift to higher proficiency levels in science literacy. However, 10 schools, including Sang Community Day SHS (100.0 percent), Amantin SHS (83.3 percent), and Langbinsi SHS (83.3 percent) had more than 60 percent of their students at the emerging level (0 in annex 3). Of note, three schools, Brakwa Senior High Technical School, Notre Dame Girls SHS, and Nyinakin SHS, had no students in the two lowest proficiency levels.

Table 3.13 Percentage of students at different levels of science literacy

Assessments	Highly Proficient (80–100%)			Proficient (68–79%)			Approaching Proficiency (54–67%)			Developing (40–53%)			Emerging (0–39%)		
	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023
Sex															
<i>Male</i>	0.0	0.2	6.3*	3.7	8.2	16.5*	31.4	33.6	28.6	41.0	36.9	25.6*	24.0	21.1	23.0
<i>Female</i>	0.0	0.0	3.4*	2.6	8.2	14.2*	24.5	25.9	30.4	40.1	38.2	29.3*	32.8	27.8	22.7*
Level of student															
<i>Form 1</i>	0.0	0.2	4.3*	2.5	6.2	13.0*	26.6	24.6	31.2*	41.4	39.5	27.9*	29.5	29.5	23.8*
<i>Form 2</i>	0.0	0.0	5.4*	3.8	10.3	17.8*	29.4	34.7	27.8*	39.8	35.5	27.0*	27.0	19.6	21.9
School category															
<i>Category A</i>	0.0	0.0	24.0*	10.0	24.4	22.9	53.6	34.5	27.1	23.6	25.6	18.8	12.9	15.5	7.3*
<i>Category B</i>	0.0	0.3	4.0*	3.7	8.1	14.0*	27.1	29.0	32.0	39.4	35.6	31.0	29.7	27.0	19.0*
<i>Category C</i>	0.0	0.0	2.9*	1.6	3.9	14.9*	23.5	28.5	28.9	44.5	42.0	27.2*	30.4	25.6	26.2
School sex															
<i>Mixed-sex school</i>	0.0	0.1	3.1*	2.3	6.3	14.5*	24.7	28.8	29.4	42.8	38.6	28.5*	30.2	26.2	24.6
<i>Single-sex school</i>	0.0	0.0	25.0*	10.0	23.5	25.0	53.6	35.6	31.3	23.6	28.8	15.6*	30.2	12.1	3.1*
Overall	0.0	0.1	4.8*	3.2	8.2	15.4*	28.0	29.5	29.5	40.6	37.5	27.4*	28.2	24.7	22.9

*p<0.05

Table 3.14 Students’ mean assessment scores in science literacy by demographic characteristics

	Survey 2022	Survey 2023
Sex		
<i>Male</i>	49.9	53.1
<i>Female</i>	47.5	51.6
Level of student		
<i>Form 1</i>	47.0	51.4*
<i>Form 2</i>	50.4*	53.3
School sex		
<i>Mixed sex</i>	47.7*	51.1*
<i>Single sex</i>	56.0	66.8
School category		
<i>Category A</i>	55.7	64.9
<i>Category B</i>	48.0	52.6*
<i>Category C</i>	47.2*	50.8*
<i>Overall</i>	48.6	52.4

*p<0.05

3.6.6 SEI students’ performance in the different aspects of the science literacy

As discussed in section 3.6.2, the science literacy assessment covered three domains (i.e., context, competencies, and knowledge). Table 3.15 shows data on the domain analysis of the science literacy of students. Students performed better on local/national/social context issues compared with life across the world. Few students were able to “explain phenomena scientifically” and “use scientific evidence” in 2022 and 2023. Again, low mean scores were also recorded for “to make a scientific inquiry and explanations, i.e., “knowledge of science.” The implication is that SEI students are unable to think scientifically or learn and solve problems to make informed decisions. The disaggregated school and regional results in table A3.12 in annex 3 show that Notre Dame Girls SHS (81.7 percent) and St. Charles SHS (78.0 percent) had the highest mean scores in “knowledge of science.”

Table 3.15 Students’ performance in different aspects of science literacy (mean percent)

	Survey 2022	Survey 2023
Contexts		
<i>Local/National/Social</i>	70.6	75.7
<i>Global (Life across the world)</i>	67.2	62.6
Competencies		

	Survey 2022	Survey 2023
<i>Identify scientifically oriented issues</i>	57.5	53.3
<i>Explain phenomena scientifically</i>	52.6	47.5
<i>Use scientific evidence</i>	54.6	31.8*
Knowledge domains		
<i>Knowledge of science (physical, living and technology systems, etc.)</i>	59.0	54.2
<i>Knowledge about science (scientific inquiry and explanations)</i>	43.6	39.4
Cognitive demand		
<i>Low</i>	72.1	68.0
<i>Medium</i>	51.2	45.9
<i>High</i>	32.5	28.4

The results of the multiple regression analysis are depicted in table 3.16. A single Ordinary Least Squares multiple regression model was fitted with students' scores in science literacy as the dependent variable. Student and school demographic characteristics constituted the regressors. With a 16 percent coefficient of determination, it can be deduced that demographic variables are not efficiently explaining the variations in students' scores for science literacy. This implies that the observed improvement in students' science literacy cannot be adequately explained by their demographic characteristics. Relative to the male students, females obtained 3.9 percent lower scores in science. Being in Form 2 increases students' science literacy scores by 3.3 percent compared with Form 1. Also, based on the model's output, students in categories B and C schools scored about 10 percent lower than students in category A schools. Besides, middle belt students, southern belt, and single-sex school students performed better in science literacy than northern belt and mixed-school students.

Table 3.16 Output of multiple linear regression of science literacy assessment

Characteristics	Coefficient (Sig*)	95% confidence interval
Sex of student		
<i>Male</i>	Reference	
<i>Female</i>	-3.9*	-5.703, -2.109
Level of student		

Characteristics	Coefficient (Sig*)	95% confidence interval
Form 1	Reference	
Form 2	3.3*	1.431, 5.178
School category		
Category A	Reference	
Category B	-9.7*	-14.197, -5.171
Category C	-10.0*	-14.086, -5.909
Region		
Northern belt	Reference	
Middle belt	5.3*	2.728, 7.787
Southern belt	10.2*	7.737, 12.610
School sex		
Single-sex	12.0*	7.949, 16.115
Mixed-sex	Reference	

3.6.7 Qualitative Findings regarding students' performance on science literacy assessment

3.6.7.1 Factors contributing to low proficiency levels in science literacy in some regions and schools

Students' perception of science as a difficult subject

Some students perceive science to be difficult, complex and abstract, reflecting their underperformance. A female student narrated her experience studying science: *"The subject is very enormous. And with a topic that deals with the classification of organisms for instance, you will have to classify an organism into its kingdom, its phylum, its class, and sometimes give the characteristics of all of them. Sometimes organisms in one kingdom may have some similar characteristics. You may easily misarrange everything. And with the diversity of other living things, a lot of botanical names. And when spelling it, changing one letter makes everything wrong. And that made learning it very difficult for me as a student."* To add to the above, a male science teacher observed that students, especially females, tend to underperform in science and agriculture-related courses due to the perception that these subjects are difficult, making them unattractive to female students. Here is his statement *"When you look at the science and agric classes, females think that it is for men due to the difficult aspect of it, so they think that particular course is for only the male students; hence we see lots of girls in the home economics class."*

Another minor factor contributing to students' underperformance in science is the extensive nature of the science syllabus. Concerning the extensive nature of the syllabus, teachers are forced to hurriedly go through the lessons to cover more topics before the academic period is exhausted. Although students express their displeasure about the pace the lessons are delivered, some teachers barely acknowledge it since they are burnt on completing the syllabus. A student said, *"Our biology teacher sometimes does not give us notes. When we complain about it, he will say, biology, the topics are many. So, we need to run fast so that we can complete the topic before even getting to Form 2. Though we have textbooks, we also want the notes of the teacher so we can compare it to the textbook."*

The lack of science labs and deficiencies with existing science laboratories

The lack of science labs and deficiencies in existing ones hinder students' performance in the subject. Students believed that more practical lessons in the science lab would rekindle their interest in the subject and help them understand what is being taught. One student shared a concern: *"I am a science student in the school, and hence, we must do lots of practical lessons. But in school, we have a lot of theories, everyday theory, everyday theory. And this is because, unfortunately, our lab is not that well equipped with that sort of materials and equipment for class demonstration, hence we do not do a lot of practical lessons. I want the school to just renovate the laboratory and bring in more materials for our practical lessons to be regular and effective."* Even though some teachers have made an effort to improvise with the available resources or take students on trips to schools with better facilities, they describe these efforts as unsustainable:

- *"We don't have a science laboratory. We picked a room within the dining hall where we are keeping a few things and we have nothing so when it is time for the practical, we cannot do anything. For chemistry practical lessons, we have to go to Bole Senior High, which is also limited in resources, how often can we be commuting there? At times we do not even get a chance to take our students there to perform practical lessons due to lack of funds."*
- *"Science is a practically oriented course and looking at our school, we do not have a laboratory. Each time I want to take through any topic that needs practical, we either go to the field or schools like Nalerigu Secondary for certain practical lessons with either the school bus if there is fuel or students will have to walk to the school."*

Students also affirmed these opinions as they assert that the lack of science laboratories affects their ability to comprehend and appreciate some science topics being taught to improve their outcomes in science:

- *“I find it difficult to understand because sometimes the topic that they teach needs more practicality, more than the theory. I need practical lessons in science labs so that I can improve upon my studies.”*
- *“Sometimes when lessons are ongoing, I feel like I am in the house sleeping because the class is so boring that I do not understand anything. Sometimes, when I come to school, I am unable to understand anything. So, I want them to help us with a lab so we can experience and see what our teacher is trying to teach us.”*

3.6.7.2 Factors contributing to high proficiency levels in science literacy in some regions and schools

Focus on practical-oriented lessons rather than theory

Teachers in some schools also indicated that engaging more in practical lessons has increased students' interest and understanding of science, reflecting in improved performance. As one science teacher said, *“When there is some practical demonstration, it catches students’ attention, and this causes them to take an interest in the academic activities going on in the class.”* A teacher from the middle belt further reiterated this concern: *“Sometimes I make sure all the students take turns in demonstrating a practical lesson in the science lab and this arouses their interest in the topic.”*

On the part of the students, they think having more lessons taught with demonstrations at the lab than teaching in the abstract has resulted in better performance. Here is a quote from a student on how her use of the science lab has contributed to her understanding of science *“I have seen improvement in my studies with science and this is basically due to the practical aspect. Also, we spend some hours in our remedial session to visit the lab in a sister school to conduct more demonstrations.”*

Introduction of remedial sessions

As was discovered in reading and mathematics literacy, the insights from the qualitative interviews also associate the improvement in science literacy with the introduction of remedial sessions. These sessions provide teachers with extra contact periods with students, during which teachers can identify the peculiar challenges of underperforming students. The remedial sessions further enable teachers to put in strategies to help bridge the gap between underperforming and high-performing students by providing extra attention to students with challenges in science. For instance, a male teacher in Savannah mentioned that: *“Mostly every year we organize intervention classes for them. In such classes, we categorize the students based on their abilities. It is to let us understand them better, give them that attention, and also teach them to bridge that gap between underperformance and high performance.”*

Nonetheless, if all students are at the same level of understanding of topics taught in a regular class, teachers can start new lessons with the class to enable them to complete their syllabus for the term on time. As one female student commented: *"In our extra tuition, the topic we are treating is different from the normal class. For example, in science, the extra tuition, we are treating 'Variations', and in the normal class, we are doing 'Work and Machines'. And it helps us to move faster. It is interesting how remedial lessons have shifted a student's perspective about the difficulty of the subject. She recounted that "Science used to be one of the most difficult subjects I have ever met in my life since I started schooling but through the remedial session, my science madam has helped me in understanding the very basics of the subject. The remedial session has really helped some of us."*

Adaptation of technology and new teaching methods

Another reason students perform well in science literacy is the adaptation of other resources aside from textbooks during lesson delivery through teacher participation in PLCs. This ignites the interest of students as it transforms abstract topics into realistic ideas that can be related. An instance cited by a student is when teachers deploy the use of pictures and videos during lesson delivery, as indicated in her statement: *"The teachers have employed different and new teaching methods which are more flexible. So, we are able to gain an understanding of the concepts. They have employed methods like using pictures and videos to describe or to explain certain topics to us."* Though some schools may not have the best science laboratories (or may not have one at all), teachers have adapted the use of technology and improvised better strategies to make lessons relatable to the class. A teacher recounted that, *"We do not have labs and the facilities that are going to help us, but we manage to improvise sometimes. We take our laptops to the class, demonstrate some assignments, and so many things to them. I think all these are things that are helping them."* This is verified by students as they described how the integration of ICT in lesson delivery has been beneficial to them. In the words of a student, *"I can say I am seeing improvement in my studies on science because of how our teachers use more ICT gadgets like showing us videos with his laptop during the science class."*

3.7 Evaluation of 21st century skills assessment

3.7.1 The framework for assessing 21st century skills

Twenty-first-century skills, as defined by the Ministry of Education (MoE)'s secondary education strategy, cover:

- Foundational knowledge, which includes literacy, numeracy, scientific literacy, ICT and digital literacy, financial literacy and entrepreneurship, cultural identity, civic literacy, and global citizenship.

- Competencies include critical thinking and problem-solving, innovation and creativity, collaboration, and communication.
- Character qualities include discipline and integrity, self-directed learning, self-confidence, adaptability and resourcefulness, leadership, and responsible citizenship.

The framework for assessing 21st century skills is in annex 1 The framework provides a broader explanation of the elements entailed in the three areas under 21st century skills.

Overall, the 2022 and 2023 assessments of 21st century skills were conducted in much the same way:

1. The assessment of 21st century skills included 50 multiple-choice items. Students were allowed 80 minutes to complete the assessment.
2. The assessments were paper-based.
3. There was no variation between the assessment tools, as the same assessment tool used in 2022 was repeated in 2023. No new items were added to the 21st century skills assessment instrument in 2023.

3.7.2 Proficiency levels for 21st century skills

Table 3.17 Proficiency levels for 21st century skills

Level of proficiency	Score	Characteristics
Highly proficient	80 - 100%	At this level, students can identify and analyse multiple perspectives. They can reason about ideas and make predictions well beyond the information given in a problem while also effectively evaluating large amounts of information. Students at this level can reason with large amount of information without additional support provided, meaning they can make connections across elements of various problems on their own. These students can effectively explain situations and aspects of situations that require complex thinking such as recognizing unintended consequences, evaluating information to differentiate between biased and unbiased sources and identifying short- and long-term consequences of actions.

Level of proficiency	Score	Characteristics
Proficient	68 - 79%	Proficient students can identify and analyse as many problems as possible. Students at this level can provide descriptions of situations that are less familiar or require deeper reasoning such as ones that require causal reasoning. These students can also provide explanations of situations and aspects of situations. They demonstrate consistency in their ability to assess, describe and/or explain situations across multiple activities within a problem.
Approaching proficiency	54 - 67%	Approaching proficiency students can identify and analyse moderate problems and resolve them. Here, a trade-off is observed between students' ability to reason beyond the explicit information provided in a given problem and the amount of information that must be evaluated. Approaching proficiency students can explain a given situation or aspects of the situation. They demonstrate consistency in being able to assess, describe and/or explain situations across multiple activities within a given problem.
Developing	40 - 53%	Developing students can identify and analyse basic problems and resolve them.
Emerging	39% and below	Emerging students are low achievers in 21 st century skills. Few of these students can think critically and solve problems.

3.7.3 How students performed on 21st century skills

The results from figure 3.5 indicate that students across the 100 sampled schools performed better in 21st century skills in 2023 than in 2022. Students have been able to transition from approaching proficiency to being proficient and consequently highly proficient in 21st century skills.

Contrary to the benchmark level of proficiency required by NaCCA for secondary education students in reading, science, and mathematics, the proficient level is the minimum required proficiency for students in 21st century skills.

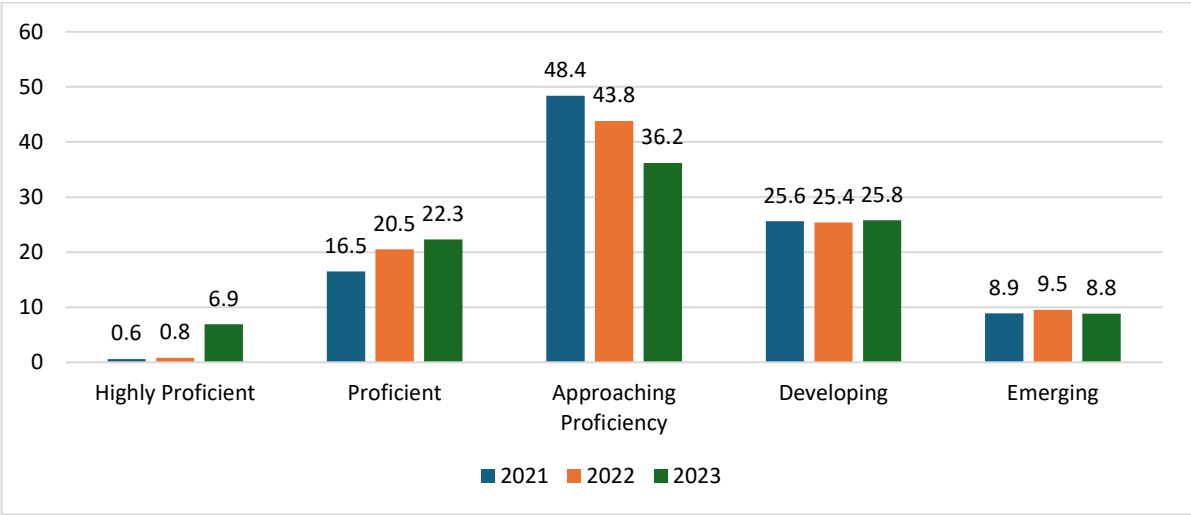
Close to 30 percent of students were either highly proficient or proficient in 21st century skills in 2023. These students can at least identify and analyse as many problems as possible and provide descriptions of situations that are less familiar or require deeper reasoning. In 21 schools, half their students were either proficient or highly proficient in 21st century skills. Diaspora Girls' SHS (100.0

percent), Notre Dame Girls SHS (100.0 percent), Notre Dame Seminary SHS (100.0 percent), and Nyinahin Catholic SHS (91.7 percent) had an overwhelming proportion of students at this level (table A3.15). At least, 3 in 10 students from seven regions including Western North, Bono, and Central, were top performers in 21st century skills in 2023 (table A3.14).

At the lowest proficiency levels (developing and emerging) in 21st century skills, not much difference was observed in the share of students performing at these levels in 2022 and 2023. Overall, 8.8 percent of the students assessed in 2023 were developing students. These students can identify and analyse basic problems and resolve them. However, the Savannah region recorded the largest share of students who were developing proficiency in 21st century skills, followed by North East and Oti (table A3.14). More than 50 percent of the students in seven schools in 2023 were also developing students (table A3.14).

More than one-third of students in the sampled schools were approaching proficiency in 21st century skills in 2023. The students at this level can identify and analyse and resolve moderate problems. They can also explain a given situation or aspects of the situation. The share of students who performed at this level declined from 43.7 percent in 2022 to 36.2 percent in 2023.

Figure 3.5 Percentage of students at different levels of 21st century skills – overall result

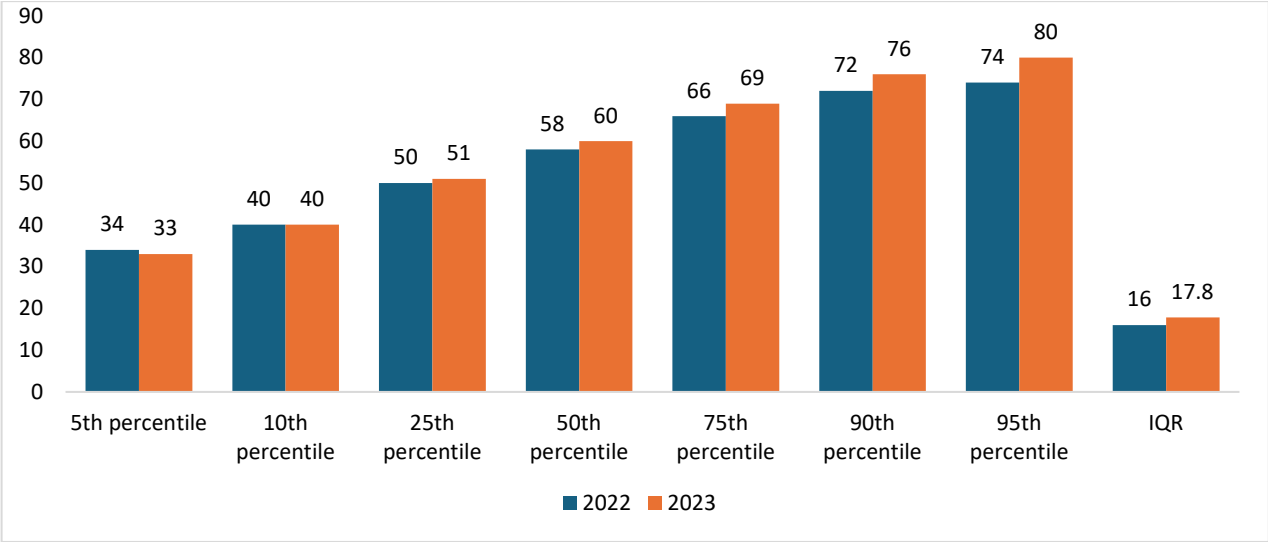


The stability in mean performance in the 21st century skills across the sampled schools marks changes in the distribution of student performance. We computed the percentiles and interquartile range (IQR) students’ performance (figure 3.6). The 10th percentile is the point on the scale below which 10 percent of students scored. In other words, if all students were ranked from lowest to highest scoring, the 10th percentile would be the highest score of the lowest-performing 10 percent of students. Likewise, the 90th percentile is the point on the scale below which 90 percent of students scored (or above which only 10 percent of students scored). The median or 50th percentile divides the performance distribution into two halves, one above and one below that position on the scale. The IQR measures

the spread or dispersion of the middle half of the data. It is computed by subtracting the value of the 75th percentile from the 25th percentile.

As seen in figure 3.6, some variations can be observed in the 75th to the 95th percentiles from the distribution of students’ performance in 21st century skills across the sampled SEIs.

Figure 3.6 Percentiles and IQR of 21st century skills results (%)



3.7.4 SEI students’ attainment of the different proficiency levels in 21st century skills

Highly proficient

Students at this level of proficiency can identify and analyse multiple perspectives. They can effectively explain situations and aspects of situations that require complex thinking, such as recognizing unintended consequences, evaluating information to differentiate between biased and unbiased sources and identifying short- and long-term consequences of actions.

On average, compared with 2022 (0.8 percent), there is an increase in the proportion of students attaining highly proficient levels in 21st century skills in 2023 (6.9 percent). Category A and single-sex schools had the greatest share of 1 in 10 students being highly proficient in 21st century skills. For every 4 students, at least one was a highly proficient student in Boso SHTS (25.0 percent), Anlo Awomefia SHS (25.0 percent), Odoben SHS (25.0 percent), Krobo Comm. Senior High (30.8 percent), Diaspora Girls' Senior High (33.3 percent), Notre Dame Seminary SHS (33.3 percent), Brakwa SHS (33.3 percent), Notre Dame Girls SHS (41.7 percent), and Nyinahin Catholic SHS (66.7 percent) ([table A3.15](#)).

Proficient

Proficient students can identify and analyse as many problems as possible. Students at this level can provide descriptions of situations that are less familiar or require deeper reasoning, such as ones that require causal reasoning. Proficient students are part of the top performers in 21st century skills because they can demonstrate consistency in their ability to assess, describe and/or explain situations across multiple activities within a problem.

Close to one-quarter of students demonstrated proficiency in 21st century skills in 2023. Unlike 2022, single-sex school students had the highest share of students performing at this level in 2023. Male students, Form 2 students, and category A students have recorded the largest proportion of students who were proficient in 21st century skills in both 2022 and 2023 (table 3.18).

Western North region (33.3 percent) recorded the highest number of proficient students in 21st century skills. At the school level, 23 schools had at least a third of their students being proficient in 21st century skills. Particularly, more than half of the students in Our Lady of Provide SHS (66.7 percent), Diaspora Girls' Senior High (66.7 percent), and Notre Dame Seminary SHS (66.7 percent) performed at the proficient level in 21st century skills (table A3.14).

Approaching proficiency

Students approaching proficiency can identify and analyse moderate problems and resolve them. A trade-off is observed between students' ability to reason beyond the explicit information provided in a given problem and the amount of information that must be evaluated. These students can explain a given situation or aspects of the situation. They demonstrate consistency in being able to assess, describe and/or explain situations across multiple activities within a given problem.

Across the sampled schools, 36.2 percent of students were approaching proficiency in 21st century skills in 2023 (table 3.18). Most of the students in 28 of the schools, including St. Ann's Girls SHS (75.0 percent), St Augustine SHS (75.0 percent), and Awutu Bawjiase Community SHS (66.7 percent), were approaching proficiency in 21st century skills in 2023 (table A3.14). Western (47.2 percent), Volta (43.5 percent), and Greater Accra (41.7 percent) had the greatest proportion of students approaching proficiency in 21st century skills (table A3.14).

Developing

Overall, there was not much variation between the share of developing students in 2022 and 2023. Generally, one in four of the SEI students sampled were developing proficiency in 21st century skills. These students can identify and analyse basic problems and resolve them. For 2022 and 2023, most developing students were from category C schools. Specifically, more than 60 percent of the students

in Kwaobaah Nyanoa Community SHS (66.7 percent) were developing students in 21st century skills (table A3.14).

Emerging

Emerging students are low achievers in 21st century skills. Few of these students can think critically and solve problems. This is, however, true for less than 1 in every 10 SEI students across the sampled SEIs in 2023 (table 3.18). Half of the students in North East were low achievers in 21st century skills in 2023. Also, more than 50 percent of students in Yagaba SHS (58.3 percent), Amantin SHS (66.7 percent), and Wapuli Community SHS (75.0 percent) were emerging in 21st century skills ([table A3.14](#)).

Table 3.18 Percentage of students at different levels of 21st century skills

Assessments	Highly Proficient (80–100%)			Proficient (68–79%)			Approaching Proficiency (54–67%)			Developing (40–53%)			Emerging (0–39%)		
	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023
Sex															
<i>Male</i>	0.7	0.9	7.2	17.0	21.5	23.4	51.4	45.3	34.5*	23.1	23.6	25.4	7.8	8.7	9.4
<i>Female</i>	0.5	0.8	6.5*	16.0	19.7	21.3	45.4	42.3	37.9*	28.1	27.0	26.3	10.0	10.2	8.1
Level of student															
<i>Form 1</i>	0.4	0.2	5.5*	12.8	18.6	20.1	47.2	42.2	38.7	28.9	28.9	26.3	10.7	10.2	9.4
<i>Form 2</i>	0.8	1.5	8.2*	19.8	22.4	24.5	49.4	45.2	33.7*	22.6	22.0	25.4	7.3	8.9	8.2
School category															
<i>Category A</i>	0.8	1.8	15.6*	40.9	34.5	37.5	43.2	42.9	32.3	11.4	17.3	12.5	3.8	3.6	2.1
<i>Category B</i>	1.2	1.2	4.4	14.9	19.6	23.8	53.0	46.2	39.3	21.2	24.0	23.5	9.7	9.1	9.1
<i>Category C</i>	0.3	0.3	6.7*	12.7	17.4	20.0	47.1	42.4	35.5*	30.5	28.5	28.3	9.5	11.4	9.5
School sex															
<i>Mixed-sex school</i>	0.6	1.5	5.9	14.8	40.2	20.5*	48.4	42.4	36.8*	26.9	12.9	27.3*	9.4	3.0	9.5
<i>Single-sex school</i>	1.2	0.8	17.9*	38.8	18.1	43.2*	48.2	43.9	29.5	9.4	26.9	9.5*	2.4	10.3	0.0
Overall	0.6	0.8	6.9*	16.5	20.5	22.3	48.4	43.8	36.2*	25.6	25.4	25.8	8.9	9.5	8.8

*p<0.05

NOTE: Figures may not sum up to 100% due to rounding

Table 3.19 provides the mean percentages on the 21st century literacy. Based on the results, there were significant improvements on key demographic characteristics from 2022 to 2023.

Table 3.19 Students’ mean assessment scores in 21st century literacy by demographic characteristics (%)

	Survey 2022	Survey 2023
Sex		
<i>Male</i>	57.5	59.3
<i>Female</i>	55.9	59.2
Level of student		
<i>Form 1</i>	55.5	58.3*
<i>Form 2</i>	57.7	60.2
School sex		
<i>Mixed sex</i>	62.8	58.4*
<i>Single sex</i>	55.9	69.6
School category		
<i>Category A</i>	61.2	67.4
<i>Category B</i>	57.2	59.0*
<i>Category C</i>	55.1	58.4*
<i>Overall</i>	56.7	59.2

*p<0.05

3.7.5 SEI students’ performance in the different aspects of 21st century skills

Each item in the 21st century skills assessment was classified under three broad areas: foundational knowledge, core competencies, and character qualities.

In table 3.20, an analysis of the domain for 21st century skills is presented. For both 2022 and 2023, the results show a consistent trend. Students performed best on “discipline and integrity,” followed by items on “responsible citizenship.”. [Table A3.16](#) further provides the regional and school results.. The average score in critical thinking was less than 20 percent. Nyinahin Catholic Senior High (70.2 percent), Notre Dame Sem/Senior High (64.3 percent), Notre Dame Girls SHS (63.1 percent), and Odoben SHS (63.1 percent) had relatively higher average scores in financial literacy compared with the others. For 15 schools, including Wapuli Community SHS (30.6 percent), St. Augustine Senior High/Technical School (33.3 percent), and Maame Krobo Community SHS (36.1 percent), the students had a mean score less than 50 percent in ICT and digital literacy.

Table 3.20 Students’ performance in different aspects of 21st century skills assessment (mean percent)

	Survey 2021	Survey 2022	Survey 2023
Discipline and Integrity	78.3	79.8	81.5

Responsible citizenship	66.8	68.2	66.0
Cultural identity, civic literacy, and global citizenship	64.0	61.9	64.0
ICT and digital literacy	62.0	62.7	65.8
Self-discipline	61.8	63.2	65.2
Adaptability and resourcefulness	59.1	60.6	62.9
Leadership	55.4	58.04	60.1
Financial literacy and entrepreneurship	45.6	47.8	49.2
Critical thinking and problem-solving	32.0	32.8	35.5

Table 3.21 summarizes the output of a multiple linear regression model in which students' scores in 21st century skills are used as the dependent variable, with student and school demographic characteristics as regressors. The coefficient of determination (9 percent) suggests that the independent or demographic variables do not efficiently explain the variations in students' scores for 21st century skills literacy. This implies that other factors could contribute to the changes noted in the students 21st century scores. Though not significant, Form 2 students obtained 2.8 percent higher scores compared with Form 1 students. Also, students in category B and C schools obtained about 7.3 and 6.3 percent scores lower than students in category A schools, but it is not statistically significant. Compared with males, however, females' result in 21st century skills are significantly lower by 1.5 percent.

Table 3.21 Output of multiple linear regression of 21st century literacy assessment

Characteristics	Coefficient (Sig*)	95% confidence interval
Sex of student		
<i>Male</i>	Reference	
<i>Female</i>	-1.5*	-3.078,
Level of student		
<i>Form 1</i>	Reference	
<i>Form 2</i>	2.8	1.258, 4.367
School category		
<i>Category A</i>	Reference	
<i>Category B</i>	-7.3	-11.196, -3.502
<i>Category C</i>	-6.3	-9.762, -2.777
Region		
<i>Northern belt</i>	Reference	
<i>Middle belt</i>	7.0	4.796, 9.129

Characteristics	Coefficient (Sig*)	95% confidence interval
<i>Southern belt</i>	10.2	8.103, 12.215
School sex		
<i>Single-sex</i>	9.2	5.716, 12.693
<i>Mixed-sex</i>	Reference	

3.7.6 Qualitative Findings regarding students' performance on 21st century skills

3.7.6.1 Factors contributing to low proficiency levels in 21st century skills in some regions and schools

Given how relevant acquiring 21st century skills are to students, the qualitative survey sought the opinions of teacher and heads of schools in understanding the factors contributing to students' inability to demonstrate these skills in the assessments.

Lack of digital and ICT resources to facilitate teaching and learning

Some teachers opined that, for students to possess 21st century skills, teaching and learning should be facilitated with 21st century tools such as projectors, laptops, and the like. As a teacher stated, *"To ensure that we can incorporate knowledge in them, we need 21st century tools such as the projectors, laptops ..."* However, this is not the case in many schools. Some schools do not have electricity, so it is a challenge to incorporate ICT in their lessons. Here are quotes from teachers on the lack of digital and ICT resources in schools.

- *"...due to the lack of projectors using even our laptops in the classrooms has been a problem. Even common power (electricity), power in the classroom is a problem."*
- *" Sometimes we also want to incorporate ICT into the lesson, but our school does not even have a single computer. So, I think those are the challenges that we are facing in helping students to know how to search for solutions to problems."*

Lack of learning facilities such as libraries, computers, and science laboratories

Another factor contributing to students' inability to exhibit 21st century skills is the lack of learning facilities such as libraries and science and computer labs. According to some teachers, even when students are given project work to do as a group, the students are challenged as there are no learning centers where students can easily visit to engage in research work to gain insights into such tasks. For instance, as a female teacher mentioned, *"our school does not have a computer lab and library, so even if you give students a task to go and read on a topic, their access to other reading materials is limited so they are unable to research on the assigned topics. But if we had a library, students*

could easily search through diverse books for their research.” Another teacher also lamented how the lack of these facilities affects students, saying, “Although many students have smartphones, they do not even know how to use the internet to search for information or do research. But if our computer labs were well furnished, we could have assisted students on how to navigate the internet as a tool to learn rather than using it on social media pages like TikTok and Facebook that students only patronage.” Again, if these facilities are made available, students could be taught to harness even their smartphones for research to develop their 21st century skills and knowledge rather than for social media.

Poor academic background of students

The weak academic background of students from the basic level was another notable reason why students are unable to exhibit 21st century skills. Some teachers expressed great concern with how students are unable to read and express themselves in English. Here are some responses from teachers:

- *“I will say that most of the students we have do not have even basic reading skills. Sometimes we wonder how they were able to make it this far to be in the senior high level. So, we are constantly on the English teachers because if students are unable to read and write properly, then how can they even identify and address problems.”*
- *“The students in our locality have low intelligence quotient (IQ) as compared with those in the urban areas sometimes we are even forced to use the L1¹⁵ to explain certain concepts before some students are even able to understand what we are teaching.”*
- *“You will be surprised if I tell you our students cannot even read two or three-letter words and they are here at the senior high level. But what can we do, we are only forced to always start from scratch before they can grasp any understanding of the lessons.”*

Students’ negative attitudes

In understanding why students underperformed on the 21st century assessment, very few teachers attributed this to students’ negative attitudes toward learning. According to the teachers, students attach importance only to examinable subjects. Here is what a male teacher shared in the interview: *“Here in this school, we do not write terminal exams on ICT that is for students who are not offering the course as an elective, and because of this, students do not attach any level of seriousness to the lesson meanwhile, knowledge on ICT is a core skill every student need to have.”*

¹⁵ L1 refers to the use of native languages from kindergarten to grade 3 as the mode of communication during lesson delivery.

3.7.6.2 Factors contributing to high proficiency levels in 21st century skills in some regions and schools

Incorporating technology during lesson delivery

A factor contributing to students' ability to demonstrate 21st century skills is the exposure to new methods of teaching, where some teachers try to incorporate ICT during lesson delivery. An instance cited by a student in Western North is when teachers deploy the use of pictures and videos during lesson delivery, as mentioned in her statement that *"our teachers do not only come and talk, but now some of them bring their laptops to class where they play videos and show us pictures on topics. After this, they placed us in groups to do short and quick brainstorming activities on what we saw before the lessons continued. This has helped us to stay sharp."* Furthermore, the qualitative analysis realizes that due to the practical lessons in the science labs, research activities at the school libraries, and group presentations, some students have been well-equipped to demonstrate skills such as collaborating to work as a team, communicating as team members and harnessing their problem-solving skills as they seek solutions to assigned tasks.

Discipline nature of both teachers and students

Teachers and headmasters attributed the ability of students to exhibit 21st century skills to the discipline in the schools. This finding was observed in most mission schools¹⁶ where some teachers explained that, through the mission's activities parents and teachers are to oriented see their role as service to God. Therefore, encouraging each stakeholder to stay committed to ensuring the strategies the school develops to guide students' behavior are well adhered to. Some verbatims are cited below:

- *"Because this is a mission school, the mission is always encouraging us, the teachers, to see our role as a calling, and this serves as a motivation for teachers to give their best at all times."*
- *"We think that character formation should even be first. So, for us, you either become disciplined or you respect our rules and regulations, or you are not our student."*
- *"Parents and guardians have shown incredible support to the school, so anything the school management suggests to aid in teaching and learning, you always see that the parents are always supporting. Even when it comes to food, it is not a problem here. Parents support the school so teachers are motivated to give their best."*
- *"When it comes to disciplining the students, we have the full cooperation of parents, and the students know this as well that, once they misbehave, their parents will be called and they will be punished so everyone tries to stay disciplined."*

¹⁶ Mission schools are schools built and administered by religious organisations in Ghana.

3.8 SEI students' outcome indicators

3.8.1 Percentage of SEI students by grade who demonstrate subject knowledge and 21st century skills.

Table 3.22 summarizes students' performance on subject knowledge and 21st century skills. The subject knowledge figures are the average scores for reading, mathematics, and science.

Table 3.22 Students subject knowledge and 21st century proficiency levels by grade (%)

Assessments	Highly Proficient (80–100%)			Proficient (68–79%)			Approaching Proficiency (54–67%)			Developing (40–53%)			Emerging (0–39%)		
	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023
Subject Knowledge	0.1	4.0	5.7	5.4	8.7	10.5	28.2	20.9	20.1	38.0	31.3	26.7*	28.3	35.0	37.1
Form 1	0.1	3.2	4.4	4.9	7.3	8.9	28.2	17.6	18.7	37.4	32.1	26.2	29.4	38.1	41.9
Form 2	0.1	4.8	7.0	5.8	10.2	12.1	28.2	24.3	21.4	38.6	30.5	27.2	27.4	30.4	32.3
21 st century skills	0.6	0.8	6.9*	16.5	20.5	22.3	48.4	43.8	36.2*	25.6	25.4	25.8	8.9	9.5	8.8
Form 1	0.4	0.2	5.5	12.8	18.6	20.1	47.2	42.2	38.7	28.9	28.9	26.3	10.7	10.2	9.4
Form 2	0.8	1.5	8.2	19.8	22.4	24.5	49.4	45.2	33.7	22.6	22	25.4	7.3	8.9	8.2

*p<0.05

NOTE: Percentages may not sum to 100 due to rounding.

3.9 Teacher-related results

3.9.1 Teachers who are motivated and want to remain in the profession

Teachers' dedication and competence are two important factors that influence students' learning.¹⁷ Teachers who are committed to the teaching profession have a higher likelihood of going beyond the skills they have acquired to be innovative and resourceful in using innovative means of imparting knowledge to their students. Another key factor that drives teachers' willingness to commit to their work is motivation. Such motivation refers to the psychological process that influences individual behaviour with respect to the attainment of workplace goals and tasks. Motivation has also been viewed as energy or drive that moves an individual to do a task naturally¹⁸.

The survey measured teachers' motivation and their desire to remain in the teaching profession until they reach their retirement age. Teachers were asked to self-rate whether they agree or disagree (five-point Likert scale) with questions relating to their motivation. The items were adapted from a World Bank study on teacher motivation, incentives and working conditions¹⁹. The score for this indicator was computed by dividing the average score obtained by 5 (i.e., the average maximum score for the indicator). For instance, if the average score obtained is 3.8, the score would be computed as $(3.8/5 * 100) = 76.0$ percent.

The results are presented in table 3.23 and show significant improvement between 2022 and 2023. Almost 16 percent of the teachers were motivated to teach in 2023, compared with 10.3 percent in 2022. We note that most teachers who indicated that they are motivated are mainly from category B schools. In contrast, the results further recorded no significant difference in 2023 in teachers' willingness to remain in the teaching profession.

Table 3.23 Teachers who are motivated and want to remain in the profession (%)

Category	Motivated teachers			Teachers who want to remain in the profession		
	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023
Sex						
<i>Male</i>	8.7	9.6	15.2*	39.5	43.3	42.9
<i>Female</i>	11.9	12.1	18.4*	49.1	56.0	59.7
School category						

¹⁷ Bennell, P., & Akyeampong, K. (2007). Teacher Motivation in Sub-Saharan Africa and South Asia. Department for international development (DFID)

¹⁸ Jiyang Han & Hongbiao Yin | Mark Boylan (Reviewing Editor) (2016) Teacher motivation: Definition, research development and implications for teachers, Cogent Education, 3:1, DOI: [10.1080/2331186X.2016.1217819](https://doi.org/10.1080/2331186X.2016.1217819)

¹⁹ World Bank. 2009. Teacher Motivation, Incentives and Working Conditions. Washington, DC: World Bank.

<http://documents1.worldbank.org/curated/en/468341468306561093/pdf/705540BRIOP1060ion0300December02009.pdf>

Category	Motivated teachers			Teachers who want to remain in the profession		
	Survey 2021	Survey 2022	Survey 2023	Survey 2021	Survey 2022	Survey 2023
Category A	11.8	12.5	14.3	44.7	54.9	39.8*
Category B	9.9	12.2	17.2*	41.3	44.6	45.9
Category C	8.9	8.4	15.7*	42.0	45.5	47.6
Years of teaching						
Less than 5 years	11.3	11.0	17.4*	43.5	47.1	46.2
5 to 10 years	8.9	9.0	17.2*	40.8	40.6	46.3
More than 10 years	8.7	10.6	14.6	41.8	49.5	47.2
School sex						
Mixed-sex	12.5	10.2	16.0*	41.9	45.5	46.9
Single-sex	9.3	10.7	14.7	44.2	54.4	45.0
Age category						
Youth (35 and below)	10.1	10.1	18.5*	41.2	42.5	44.1
Non-youth (36+ years)	8.9	10.6	14.4	44.3	50.3	48.6
Overall	9.6	10.3	15.9*	42.1	46.5	46.7
Total (N)	1,453	1,482	1,489	1,453	1,482	1,489

*P ≤ 0.05

[Table A3.17](#) and [A3.18](#) disaggregate the data by region and school. The results show that Bono, Ashanti, and Greater Accra recorded the highest proportion of teachers who are motivated. Northern Ghana, namely the North East, Northern, and Upper West regions had the least motivated teachers. Oti region recorded the highest proportion of teachers willing to remain in the teaching profession, followed by the Western North region. The Northern region recorded the lowest proportion of teachers who wished to remain in the teaching profession.

The analysis further revealed that among teachers who are motivated, about 40 percent would like to leave the teaching profession. North East region, followed by teachers in the Ahafo and Upper West regions, had the highest proportion of teachers who indicated that they would like to leave the teaching profession despite claiming to be motivated.

Interviews with teachers across the regions revealed that teachers generally understand the concept of motivation. Most could distinguish between intrinsic and extrinsic motivation and cited various reasons that drive their motivation to be teachers. For most teachers, the key factors that intrinsically motivate them are the differences they make in the lives of the students they teach. Some of the teachers cited various instances where, after years, some past students called to thank them for their impact on their lives. Other teachers also cited instances where former students sent them donations and gifts as rewards for the impact and support they provided them. For example, a teacher in the

Ahafo region *noted that “a number of my past students came to visit me with gifts and donations. In fact I was very happy. Though I didn’t expect anything from them, it made me happy that they remembered the impact I made in their lives.”*

For other teachers, the joy of teaching and positively influencing students' lives outweighs the challenges that come with remaining in the teaching profession. Beyond the intrinsic drivers for teacher motivation, some teachers also confessed that ongoing changes, such as the introduction of PLCs, have renewed their love for teaching. A male teacher commented that since he *“started using the lessons learned from the PLCs, I have noticed that my students have become very serious when I give them tasks. Sometimes, they come to me to ask me when I will give them a project to work on, and it really makes me happy to be honest. Now, I feel like I am really imparting on the students because of their responses and it really motivates me.”*

Nonetheless, some teachers also expect to see their sacrifices as teachers rewarded with better working conditions than they currently experience. For example, a teacher in an SHS, when asked about the opinion of teachers who were motivated due to the impact they make in the lives of students, retorted that *“...although as a teacher, I am imparting in the lives of students, I don’t think being a teacher is imparting in the lives of my family. The salary is small and it does not do so much for me. If the salary is increased by the government, I think I will be motivated more.”*

Table 3.24 shows the percentage of teachers who agree or strongly agree with statements about their motivation. Nearly all teachers agreed that their remuneration is not sufficient for their needs. There was a significant improvement in teachers who reported that “they do not get paid on time.”

Table 3.24 Teachers who strongly agree/agree to questions on motivation (%)

Items assessed for teacher motivation	Overall		
	Survey 2021	Survey 2022	Survey 2023
As a teacher, I am contributing positively to the lives of my students.	97.3	96.1	95.5
I feel confident about my abilities as a teacher.	95.2	93.7	93.9
I can get students to work in groups or pairs.	94.8	93.6	94.2
If a student does not remember information in a previous lesson, I would know how to help them remember.	94.7	92.0	93.0
Every teacher can continue to improve their practice throughout their career.	92.0	91.2	90.1
I can make my classroom a safe space for students, both emotionally and physically	91.2	91.2	92.5
I can motivate students who show low interest in school.	90.8	91.7	92.1

Items assessed for teacher motivation	Overall		
	Survey 2021	Survey 2022	Survey 2023
If a student in my class is undisciplined, I know some techniques to direct him or her.	90.6	89.1	90.9
With the help of my colleagues, we can solve student issues.	90.2	90.8	88.6
My pay as a teacher is insufficient to support my needs	90.0	92.2	87.3
With the help of my colleagues, we can identify innovative practices.	89.4	90.3	90.9
When a student gets a better grade than he or she usually gets, it is because I found a better way.	83.6	78.5	82.1
I can get through to even the most difficult or unmotivated students.	83.1	83.0	84.0
My headteacher treats me with respect.	81.4	82.7	80.0
I feel exhausted at the end of the school day	80.9	81.1	78.8
I feel energized when my class greets me each day	77.4	77.5	79.4
My colleagues at school make it a fun place to be.	76.2	73.8	75
I can help students overcome some difficulties at home and in the community	75.0	73.5	75.7
I ask my colleagues for feedback.	73.0	73.3	79.2
I ask my supervisor for feedback.	72.2	70.6	77.2
I would accept that offer if I were offered another job outside the teaching profession at about the same or a slightly higher salary. ‡	69.9	62.4	64.7
I have the ability to get parents involved in their children's education.	67.8	70.4	71.2
My headteacher praises me for my efforts in the school.	62.2	63.5	68.5
Some teachers at my school want to transfer to other schools‡	57.2	56.8	56.3
Parents value my work as a teacher‡	53.8	57.2	59.4
Teaching is mentally draining. ‡	53.1	52.8	49.5
I feel fatigued when I get up in the morning and have to face another day at school	52.8	57.8	52.2
I plan lessons with a colleague	52.7	52.8	53.6
I can influence some of the decisions that are made in the school.	49.1	51.6	53.2
As a teacher, I am given more responsibilities than I can manage. ‡	38.7	36.7	31.9
If I had to choose again, I would still want to be a teacher.	36.8	46.2	46.4
Teachers in my school, work closely with the district SISOs (formerly circuit supervisors)	34.1	34.1	39.3*

Items assessed for teacher motivation	Overall		
	Survey 2021	Survey 2022	Survey 2023
I do not get paid on time. ‡	18.8	21.9	16.9*

*p<0.05

NOTE: ‡Respondents who agreed or strongly agreed with a negative statement. In the computation of the rubric, the highest score was allotted to those who disagree strongly and the lowest score to teachers who agree strongly.

The study conducted an exploratory factor analysis using principal component analysis to determine the variables relevant to measuring teachers' motivation based on the Likert scale used for the assessment²⁰. Thirty-four questions, using a five-point Likert scale (5= strongly agree, 4= agree, 3= neither, 2= disagree, 1= strongly disagree), were used in the model. The result of the factor analysis generated a Kaiser-Mayer-Olkin (KMO) value of 0.8621²¹. This value indicates that the test is adequate for factoring. The results in [table A3.25](#) show that nine factors are adequate in explaining the motivation of teachers in public secondary schools. The varimax²² transformation matrix ([table A3.25](#)) lists the factors in the order of importance. As seen from the table, the factors by their level of importance are listed here:

- I can motivate students who show low interest in school.
- I can influence some of the decisions that are made in the school.
- With the help of my colleagues, we can identify innovative practices.
- If I had to choose again, I would still want to be a teacher.
- I feel fatigued when I get up in the morning and have to face another day at school
- As a teacher, I am contributing positively to the lives of my students.
- My headteacher treats me with respect.
- Some teachers at my school want to transfer to other schools.
- If a student does not remember information in a previous lesson, I would know how to help them remember.

The factors highlighted above show the smallest number of variables that can independently explain teacher motivation. This suggests that, instead of using the 33 variables to determine teacher motivation, the 9 listed variables will be enough to estimate teacher motivation.

20 Factor analysis is a general name denoting a class of procedures primarily used for data reduction. In many research, there may be large number of variables, most of which are correlated, and which must be reduced to a manageable level. Relationships among sets of many interrelated variables are examined and represented in terms of a few underlying factors.

21 KMO is used to examine the appropriateness of factor analysis. High values (between 0.5 and 1) indicate factor analysis is appropriate.

22 Varimax transformation matrix is a statistical technique used at one level of factor analysis as an attempt to clarify the relationship among factors. Generally, the process involves adjusting the coordinates of data that result from a principal components analysis. In other words, the varimax rotation simplifies the loadings of items by removing the middle ground and, more specifically, identifying the factor upon which data load.

Qualitative insights on teacher motivation and willingness to remain in the teaching profession

As noted above, the interviews with teachers revealed that they have an understanding of the concept of motivation, including the factors that drive their motivation. Most of the teachers explained the idea using their personal experiences as conduits to express their understanding of the concept. Some teachers explained that *"motivation is when I work hard to impart knowledge to my students, and I see that they understand everything I have taught them by my passing exams."* Another teacher also expressed that he feels *"motivated if my students write the WASSCE exams and pass my subjects. I can't really express the joy I feel to you. I feel so accomplished and happy because it makes me feel my labour has not gone to waste."* A second teacher emphasized that, *"motivation is when I teach and then my students tell their friends that I am very good at teaching. It makes me really happy because when some teachers don't do well, they tell their friends."* Among these teachers, motivation is derived from noticing the immediate impact of their work. For these teachers, encouragement and praise from school authorities and regional education officers for a good job will enhance and sustain their willingness to go beyond what is expected of them for their students.

Other teachers also expressed that school authorities have an obligation to act as motivators by providing all the essential resources to enable teachers to perform their roles and responsibilities. Some teachers also cited some challenges that have resulted in their low motivation in their schools. The major challenges include unavailable teaching and learning materials such as textbooks, inadequate desks due to the high number of students, and learning resources such as laboratories for science subjects and ICT equipment for studies.

Teachers who are motivated and would like to remain in the teaching profession

Similar to the 2021 and 2022 surveys, motivated teachers who would like to remain in the teaching profession are mostly driven intrinsically to remain in the profession. It is important not to discount the fact that despite their intention to remain, they still have complaints and challenges, which, when addressed, will further enhance teachers' willingness to remain in the teaching profession. In explaining this, a teacher in the Upper West region said he was *"motivated by the people I teach. Yes, I want to remain in the teaching profession because I want to impart knowledge to the young generation, but the government should pay teachers better. If they pay us better, I don't think there will be a teacher that will want to leave the profession."*

With regard to why teachers are motivated and would like to remain in the profession, the desire to make an impact in students' lives to be socially responsible was the reason cited most frequently. For example, a teacher in the Ashanti region commented, *"This is a sector I find myself in, and I think there's a reason why I'm here. I'm motivated enough to work in the sector. I moved from the basic*

level to the second cycle, and I'm trying to get to the tertiary level. It comes with a lot of joy when you see that you're able to impact people's lives. People are able to progress from one stage to another all by a little basic effort or knowledge you're able to impact on them." Another teacher noted, "I always want to be a teacher. Whether at the SHS or anywhere I'm teaching, I'm a teacher. I want to remain there because I feel that I'm changing people's lives. I feel that I'm changing society based on what I'm doing. I am passionate about working as a teacher because I'm changing lives." A third teacher attributed his love for teaching to his father, who was himself a teacher. He explained by saying, "I was telling somebody some time ago that if there is even a way of dying and coming back, I will come back and still teach because the one who motivated me when I was young was my father, who was a teacher, and he really inspired me, and since then, even though we talk about the difficulties, I have never regretted being a teacher."

An important aspect of motivation that the teachers espoused was the mutual dependence of teachers to collaborate in providing support within the teacher fraternity. They further stated that in the pre-PLC era, they relied mostly on themselves for information due to fear of being perceived as inadequate by other teachers. However, following the introduction of PLCs, they can comfortably engage other teachers for information regarding their lessons. For example, a teacher said, ".....since we started the PLC sessions, I have become more confident in the methods I use for teaching. Formerly, I found it difficult to ask my colleagues when I needed help because they might think I was not good or something, so I avoided them, but because I am free to ask questions during PLC, I don't feel I will be mocked so it has really helped and motivated me now." Another teacher also said that "intrinsically, I have motivated myself because the PLC sessions have added up teaching pedagogies and that has inspired me a lot. So now, when I am teaching, I know whatever I am doing, and that has motivated me a lot in my deliveries. I am well prepared and I know the type of methods to apply with respect to each topic."

Similarly, some of the teachers also said that the responsiveness of their students when they are teaching encourages them and makes them feel like they are being appreciated. For example, a teacher said, "I would say that I'm more motivated because when you go to class, the way students respond to your questions, and the way they participate fully in the lesson, it gives you an inward interest to be able to go to class. And when you give them an exercise too, they are able to do it up to expectation." A few of the teachers also mentioned that feedback from teachers who observe their lessons also encourages and motivates them to teach. Here are some quotes from teachers on motivation and intent to remain in the teaching profession:

- "I'm actually motivated as a teacher because, after teaching, I feel that if the students understand, I go home and sleep well with the mind that I'll be able to change people's lives."

- *"I'm motivated with the performance of my students, and I think that is the greatest motivation, because when you train the children or the students and they go and they perform creditably well, I feel that is my greatest joy."*
- *"...motivation cuts across both the learner and then the facilitator. So, it helps a lot. Of course, I'm motivated. The school authority organizes programs that help me to be able to ensure that my duty is being achieved. For instance, the school authority normally organizes workshops of which I do attend that particular workshop at least almost every term. And as a result of that, it is helping me to be able to achieve my ambition. I want to remain in the teaching profession because I was born to be a teacher."*

Teachers who are not motivated and would like to leave the teaching profession

The quantitative findings showed that about 55 percent of the teachers indicated that they were not motivated and would leave the teaching field given another opportunity. Further insights from the key informant interviews revealed that financial reasons are the main driving factors for the lack of motivation. These findings are similar to the 2021 and 2022 survey results. Concerning the financial reasons for the lack of motivation, the teachers stated that as long as the schools and the nation expect teachers to fulfill their responsibilities and roles as teachers, as well, teachers expect their employers to provide them with adequate compensation and welfare systems such as workplace health and safety to support themselves and their families. The issue of inadequate remuneration is persistent across the schools and regions. For example, a teacher from the Savannah region said, *"You know, we also have our needs and wants. Our employers have to do the right things to help us to be happy to go to the classroom. And if they do, we will deliver more than we are doing now. So, seriously, they have to look at our salary, and then the conditions of service have to be improved to motivate us. To be frank, if we still experience what we've been experiencing, then I think we will leave teaching."* Another teacher shared his sentiments by explaining, *"In Ghana now, looking at the economy, when you ask for motivation on the side of a teacher, he or she may only think of money. Because now the economy is on the higher side. So, the salaries that we are taking now are not enough. It's not good to cater for ourselves and our family. Somebody like me, I'm a family man. And the amount that I've been receiving at the end of the month is just scanty. So, for me, when we talk of motivation, I only think of money."*

With respect to the material and resource needs of teachers, some of the teachers complained of inadequate teaching and learning materials to aid them in providing adequate quality lessons. Other teachers also complained about the adequacy of infrastructure facilities in their schools to aid them in their teaching. For example, a teacher from one SHS bemoaned the condition of facilities in the school, which has led to a lack of motivation, even among students. He cited that the school had no

urinal for students and teachers; he further said teachers currently use the washroom of the school head. Also, classroom blocks had been converted into dormitories for boys without toilet facilities. Please see some images below:



State of urinal in the school



Makeshift classroom and dining hall



Girls' dormitory (Bags in the open)

These complaints cut across all regions but not in all the schools visited. A key observation from the data was that category C schools made the most complaints of inadequate teaching and learning materials compared with categories As and Bs. Here are some quotes from teachers on the availability of TLMs in their schools:

- *“Even in general terms, there is no motivation in the teaching service because the teaching implements that we need to aid us in teaching we are not getting them. As we speak, when you go to class, sometimes you need to project something on the board for the students to know. I have to use my own phone. Well, the school has only one projector. And for all you know, another teacher is using it. So, you can't go for it. You can't disrupt one's lesson or forgo one's lesson because there is no gadget in the school for us to use in teaching. So, if you ask this question, I am also telling you to go and tell your Ghana Education Service (GES) people that they should provide us with the teaching and learning materials for us to improve our teaching and learning, for them to get the quality of education that the government wants. I'm not motivated at all. For me, I will say no, a big no, if you ask whether I'd want to remain in this profession.”*

- *“...If you ask us to do our best, I expect certain things to be able to execute that job very well. Now, if you go into a class to teach a concept, and you need just a simple TLM to help make your work easier, it’s not available. It’s some kind of demotivation. So we feel that the motivation should not only be in cash. But giving me the necessary tools to work with is some kind of motivation because it will make my work very easy. I am not motivated at all. We don’t have the tools to work with, aside from the financial issues. If I get a better option, I will go.”*

Recommendations from teachers on ways to motivate them

The teachers provided varying recommendations on what stakeholders should do to motivate them to be more devoted and remain in the teaching profession. The most common suggestion was a review of teacher salaries. Almost all the teachers recommended a review of their salaries to ease their financial burdens.

Some teachers also recommended regular appraisal and feedback from school authorities to encourage them to improve more. Teachers also urged the government to provide adequate infrastructure to ease pressures such as overcrowding.

- *“From the management, I expect to get more resources that I can use in the classroom to enhance my teaching and learning. And then for the employers, the motivation I need from them is to improve our working conditions or our condition of service. In terms of parents, the motivation I expect from the parents is a kind of cooperation and the feedback they are supposed to provide in terms of the progress that they see from their wards’ performance. That will also motivate me to do more in the classroom.”*
- *“My key recommendation is for the government to review teacher salary so that we will also be content and work harder. Also, ever since we started the Free SHS, the number of students admitted has kept increasing but our infrastructure cannot cope. We hope the government provides us with more infrastructure facilities to accommodate the increasing number of students.”*

3.9.2 Share of secondary school teachers reporting improvements in their own well-being (access to high-quality key services, life satisfaction, food, security, and safety)

The Mastercard Foundation defines well-being as a combination of objective access to services and subjective perspectives that capture the extent to which an individual is leading a healthy, happy,

and fulfilling life connected to one’s family, friends, and community. Studies²³ have shown that teachers’ well-being exudes a positive emotional state, which strongly influences their teaching and student performance. In computing the share of teachers reporting an improvement in their well-being, the study adopted the United Kingdom’s Office of National Statistics questionnaire with additional questions related to Ghana-specific agreed upon by stakeholders. The questions for measuring the indicator were self-administered by teachers in SEIs. The self-administered items measure different aspects of a teacher’s life, including *happiness and life satisfaction, mental and physical health, meaning and purpose in life, character and virtue, close social relationships, and financial and material stability*. The items were scored on an eleven-point scale from 0 to 10, where 10 was a *total agreement* with the statements while 0 was a *total disagreement* with the statements.

The scoring criteria adopted the personal well-being score²⁴, which categorised the eleven-point scale into four categories, namely, 0-4=low, 5-6=medium, 7-8=high, and 9-10= very high. For the purposes of the indicator, teachers who obtained a score of 7 to 10 (high/very high) were reported as meeting the well-being indicator requirement.

Results on teachers’ well-being showed no significant difference between the 2022 and 2023 results or across demographic characteristics (table 3.25). A point-biserial correlation showed a weak relationship between teacher motivation and their well-being (correlation coefficient of 0.12).

Table 3.25 Teachers satisfied with their well-being (%)

Demographics	Survey 2022	Survey 2023
Sex		
<i>Male</i>	65.1	68.0
<i>Female</i>	69.2	72.7
School category		
<i>Category A</i>	68.4	64.5
<i>Category B</i>	68.6	69.8
<i>Category C</i>	64.0	69.1
Years of teaching		
<i>Less than 5 years</i>	67.9	71.0
<i>5 to 10 years</i>	64.3	70.8
<i>More than 10 years</i>	66.2	67.2
School sex		

²³ <https://www.schooleducationgateway.eu/en/pub/resources/toolkitsforschools/subarea.cfm?sa=601>

²⁴ <https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/methodologies/personalwellbeingsurveyuserguide>

<i>Mixed-sex</i>	66.3	67.6
<i>Single-sex</i>	65.3	69.2
Overall	66.2	69.0

Table 3.26 provides details of the attributes of teachers' well-being. While no significant difference was recorded for teacher wellbeing, some significant improvements were recorded for specific attributes. For example, teachers' *financial and material stability* significantly improved by 4.4 percentage points, while *happiness and life satisfaction* also improved from 33 percent in 2022 to 40 percent in 2023. The main reason teachers gave for the low scores was that the status of their finances had been impacted, which had also affected their happiness.

Table 3.26 Extent to which teachers report improvement in well-being (%)

<i>Teacher well-being criteria</i>	Survey 2022	Survey 2023
Character and Virtue	85.8	86.2
<i>Teachers who act to promote good in all circumstances, even in difficult and challenging situations</i>	88.2	88.3
<i>Teachers who are always able to give up some happiness now for greater happiness later.</i>	83.5	84.8
Meaning and purpose	84.9	85.7
<i>Teachers who feel things they do in life is worthwhile</i>	78.7	80.4
<i>Teachers who understand their purpose in life</i>	91.6	92.8
Mental and Physical Health	82.5	84.0
<i>Teachers who describe their mental health as excellent</i>	86.9	88.4
<i>Teachers who describe their physical health as excellent</i>	77.9	79.8
Close social relationships	77.8	80.5
<i>Teachers who are content with their friendship and relationships</i>	80.3	82.9
<i>Teachers whose relationships are as satisfying as they would want them to be.</i>	75.3	78.9
Happiness and Life Satisfaction	33.0	40.0*
<i>Teachers satisfied with life as a whole</i>	27.9	36.6*
<i>Teachers who describe themselves as happy</i>	38.1	43.8*
Financial and Material Stability	33.3	37.7*

Teacher well-being criteria	Survey 2022	Survey 2023
<i>Teachers who do not ever worry about safety, food, or housing</i>	35.1	38.9*
<i>Teachers who do not ever worry about being able to meet normal monthly living expenses</i>	31.4	36.4*
Overall	66.2	69.0

*p≤0.05

3.9.3 Teachers' assessment of their own resilience

The Mastercard Foundation defines resilience as the capacity of individuals, communities, institutions, and systems to survive, cope, and thrive in the face of shocks and stresses. The 2023 survey assessed resilience regarding shocks related to teachers' economic, social, health, and professional lives. The survey sought to determine the impact of shocks, the coping mechanisms adopted by the teachers to limit the impact of the shocks, and measures teachers put in place to protect themselves and their families from future occurrences.

Overall, about 86.8 percent of the teachers interviewed indicated that they had experienced at least one type of shock in 2023. Table 3.27 presents the types of shocks teachers and their households experienced in that year. The results show that the two most significant shocks were increased food prices and transportation costs. These two shocks were experienced by over 70 percent of teachers. However, there was a significant decline in teachers who reported that they experienced shocks related to an *increase in food prices*. Also, there was a significant decline in teachers who reported that their purchasing power had decreased in 2023 by 11 percentage points.

Table 3.27 provides information on the types of shocks that teachers and their households experienced. Slightly over a third of the teachers also pointed to indebtedness as a shock they had experienced in 2023. Only a few of the teachers indicated that they had experienced shocks related to their professional field, namely salary not reflecting promotion grade, unvalidated²⁵ salaries, unexpected teacher transfers, and blocking of salaries without prior notice.). These teacher-related challenges are similar to those identified in 2022.

Table 3.27 Types of shocks experienced by teachers and their households (%)

Types of shock	Survey 2022	Survey 2023
Increase in food prices or unstable food prices	82.3	78.9*

²⁵ Every month, the heads of schools are required to validate that teachers have worked for the month and so are entitled to receive their salaries. Unvalidated salaries can occur if the head of school forgets to validate or deliberately refuses to validate for various reasons.

Types of shock	Survey 2022	Survey 2023
Increase in transportation cost/fuel price increases	74.8	72.3
Purchasing power decreased	55.0	44.0*
Indebtedness (from loans)	35.5	36.4
Other large, unexpected expenses	23.0	23.3
Excessive medical bills	19.3	19.6
Illness or accident of household member (e.g., income earners, others)	18.7	20.8
Decrease in prices of own crops, livestock, or other farm produce	18.3	19.1
Salary does not reflect promotion grade	15.4	12.4
Epidemics (e.g., COVID-19, Monkey Pox, HIV/AIDS etc.)	13.5	10.3
Death of income-earning household member(s)	12.7	13.1
Loss of a regular job of a household member	11.7	9.8
Unvalidated salaries	7.0	6.2
Disasters (e.g., floods and fires)	6.7	6.8
Teacher transfers	6.5	7.5
Halt/block of salary inflow without prior notice	4.8	4.5

Table 3.28 shows the percentage of teachers who strongly agree or agree with the statements on teacher resilience. The results show a significant improvement in teachers' self-reported resilience²⁶. Males reported significant resilience compared with females. Teachers in category C schools recorded significant improvement.

Table 3.28 The proportion of teachers who self-report as resilient (%)

Demographic	Teachers who strongly agree/agree to questions on resilience	
	2022	2023
Sex		
<i>Male</i>	81.8	86.3*
<i>Female</i>	80.8	81.3
School category		
<i>Category A</i>	81.9	81.5

²⁶ Resilient in the context of this report is the ability of teachers to withstand various types of shocks, including economic, health and natural shocks that affects themselves and their families.

Demographic	Teachers who strongly agree/agree to questions on resilience	
	2022	2023
Category B	82.3	84.9
Category C	81.0	85.7*
Years of teaching		
Less than 5 years	80.1	83.9
5 to 10 years	80.6	85.8*
More than 10 years	83.0	85.3
School sex		
Mixed-sex	81.1	85.5*
Single-sex	84.8	81.2
Age		
Youth (18–35 years)	80.5	84.9*
Non-youth (36+ years)	82.4	85.6
Overall	81.6	85.2*

p≤0.05

Table 3.29 presents the proportion of teachers who strongly agree or agree with statements on teacher resilience. The statements with the highest proportion of teachers in agreement include (a) *I am not easily discouraged by failure* and (b) *I believe I can achieve my goals, even if there are obstacles*. The statement with the least agreement in both the 2022 and 2023 surveys is the belief that *teachers' ability to cope with stress can make them stronger*.

Table 3.29 Proportion of teachers who agree/strongly agree to resilient attributes (%)

	Teachers who agree/strongly agree to resilience attributes	
	2022	2023
I am able to adapt when changes occur.	90.0	88.2
I am not easily discouraged by failure.	89.3	90.4
I believe I can achieve my goals, even if there are obstacles.	89.0	90.7
I think of myself as a strong person when dealing with life's challenges and difficulties.	88.8	85.7
I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	83.0	85.7
I tend to bounce back after illness, injury, or other hardships.	81.9	84.1
Under pressure, I stay focused and think clearly.	80.6	83.6
I try to see the humorous side of things when I am faced with problems.	72.3	74.8

I can deal with whatever comes my way.	71.6	75.5
Having to cope with stress can make me stronger.	69.1	72.5
Overall	81.6	85.2

3.9.4 Teachers in dignified and fulfilling work

This section of the report measures the proportion of SEI teachers who reported that they agreed with at least two of the following indicators of dignified and fulfilling work²⁷:

- **Reliable Income** refers to income that meets the needs of secondary school teachers and their dependents or an increase in income compared with existing or previous work (over a consistent time period).
- **Reputable** refers to work that is viewed as honest and well-regarded by society at large.
- **Respect in the workplace** refers to being treated with appreciation and dignity at work.
- **Sense of purpose** refers to a sense of satisfaction, purpose, and accomplishment.

In measuring the overall indicator, teachers were asked to self-report on the four markers on a Likert scale. There was no significant difference between 2022 and 2023 ([table 3.30](#)).

Table 3.30 Proportion of teachers in dignified and fulfilling work (%)

Demographics	Survey 2022	Survey 2023
Sex		
<i>Male</i>	58.8	60.5
<i>Female</i>	64.6	64.9
School category		
<i>Category A</i>	61.6	52.7
<i>Category B</i>	62.2	64.0
<i>Category C</i>	58.6	61.6
Years of teaching		
<i>Less than 5 years</i>	60.5	64.2
<i>5 to 10 years</i>	58.3	60.4
<i>More than 10 years</i>	61.2	61.1
School sex		
<i>Mixed sex</i>	60.2	62.1
<i>Single sex</i>	60.4	54.8
Age		
<i>Youth</i>	59.3	61.3

²⁷ As defined by the Mastercard Foundation.

<i>Non-youth</i>	61.0	62.3
Overall	60.3	61.5

Details of teachers who agreed with the markers for measuring dignified and fulfilling work attributes are shown in table 3.31. A large majority of the teachers agree with the statement that, “My work gives me a sense of purpose.” The marker with the least agreement is “My teaching profession provides enough income for me and those who depend on me,” which is consistent with the reasons for low motivation and well-being discussed in previous sections of the report.

Table 3.31 Proportion of teachers who agree/strongly agree to dignified and fulfilling work attributes (%)

Attributes	Survey 2022	Survey 2023
My work gives me a sense of purpose	80.6	82.8
I feel respected at my workplace	70.5	70.3
My work is respected by people who care about me	69.4	70.5
My teaching profession provides enough income for me and those who depend on me	20.5	22.1
Overall	60.3	61.5

3.9.5 Teachers in SEIs displaying competencies in NTS

The National Teachers’ Standards (NTS) represent Ghana’s first-ever collectively agreed standards to guide teachers’ preparation and practice. They were developed as a professional tool to guide teacher educators, teachers, student teachers, and other stakeholders in education to identify in clear and precise terms what teachers are expected to know and be able to do, the qualities they are expected to possess and behaviours they are supposed to exhibit. The NTS set a clear baseline of expectations for the professional knowledge, practice, conduct, attitude, rights, and obligations expected of teachers working in schools at the pretertiary level.

3.9.5.1 Percentage of teachers in SEIs displaying core competencies in the NTS

The NTS is divided into three main domains and subdivisions, as depicted in Box 3.1. Three different tools are used to collect data for measuring the use and application of NTS: the lesson observation tool, the teacher follow-up interview tool, and the SEI student triangulation tool²⁸.

To determine the mean percent composite score for a teacher, the three tools were triangulated, and a score was assigned based on the teacher's performance. As a requirement for the indicator, teachers who obtained a minimum composite score of 75 percent were classified as satisfying the criteria of the indicator.

Box 3.1. Main domains and subdivisions of the NTS

- ❖ Professional Values and Attitudes
 - Professional Development
 - Community of Practice
- ❖ Professional Knowledge
 - Knowledge of Educational Frameworks and Curriculum
 - Knowledge of Learners
- ❖ Professional Practice
 - Managing the Learning Environment
 - Teaching and Learning Assessment

For example, for the lesson observation, if a teacher obtains an average score of 3.2 of 4 (the maximum score attainable), this will be equivalent to $3.2/4*100$ or 80.0 percent. For the teacher interview, if a teacher attained a total score of 45 of 63 possible points, this would be equivalent to $45/63*100$ or 71.0 percent. For student triangulation, if students had an average score of 2.8 (of 5), this would be equivalent to $2.8/5*100$ or 56.0 percent. Therefore, the composite score for the indicator would be $(80+71+56)/3$ or 69.0 percent.

Table 3.32 presents the percentage of teachers who displayed core competencies in the NTS during their lessons. The results show a significant improvement from 2022 to 2023. Overall, 15.2 percent of the teachers demonstrated competencies in NTS in 2023 compared with just 3.3 percent in 2021 and 2022. The improvement was also recorded for both males and females as well as across school categories.

In the 2022 survey, only 4 of the 16 regions had at least one teacher demonstrating competencies in NTS, but in the 2023 survey, 9 of the 16 regions had at least one teacher demonstrating competencies in NTS. The Volta region had the highest proportion of teachers achieving this level of proficiency in 2022. Similarly, in the 2023 survey, the Volta region still led as the best among the other regions, with 57.5 percent of teachers demonstrating proficiency in NTS, followed closely by the Western region. Tanyigbe SHS (85 percent) had the highest proportion of teachers demonstrating NTS at the school level, followed by Afife Senior High Technical School, Jacobu Senior High/Technical School, and Notre Dame Seminary SHS, all with 75 percent of teachers demonstrating NTS ([table A3.19](#)).

²⁸ Further information on the lesson observation implementation process has been provided in chapter 2.

As part of the analysis, data were imported from T-TEL’s online PLC portal²⁹, which provides information on attendance at PLCs at each public SEI. These data can be used to assess relationships between PLC attendance and teachers’ demonstration of the NTS.

Table 3.32 Percentage of teachers in SEIs demonstrating understanding and application of the NTS

Category	Survey 2021	Survey 2022	Survey 2023
Sex			
<i>Male</i>	2.8	3.3	14.8*
<i>Female</i>	4.9	3.2	16.0*
School category			
<i>Category A</i>	0.0	0.0	17.0*
<i>Category B</i>	3.1	3.2	14.9*
<i>Category C</i>	4.5	4.3	14.9*
School sex			
<i>Mixed-sex</i>	3.6	3.6	13.7*
<i>Single-sex</i>	0.0	0.0	24.1*
Overall	3.3	3.3	15.2*

*p≤0.05

Table 3.33 highlights the performance trend of teachers since the inception of the LiT programme. As highlighted in the table, teachers’ performance progressed significantly in 2023 compared with the results in 2021 and 2022. This progression in performance can plausibly be attributed to the Ministrygovernment of Education and its agencies with the support of T-TEL.

Table 3.33 Progress in teachers’ demonstration of the NTS in their lessons (%)

	2021	2022	2023
Excellent demonstration	3.3	3.3	15.2*
Good demonstration	56.8	57.6	53.7
Fair demonstration	37.9	38.9	30.9*
Poor demonstration	2.1	0.3	0.3

*p≤0.05

Table 3.34 presents the percentage of teachers who satisfy the criteria of the competencies of the lesson observation. As shown in the table, there was a significant improvement in teacher performance in 7 of 11 of the NTS criteria. These competency areas include “*Teacher exhibits ethical teacher codes of conduct during the lesson delivery*”, “*Creates a safe, encouraging learning*

²⁹ https://t-tel.shinyapps.io/secondary_reform/

environment”, “The teacher listens to students and gives constructive feedback”, “Understands how children develop and learn in diverse contexts and applies this understanding in their teaching”, “The teacher demonstrates effective, growing leadership qualities in the classroom”, “Teacher use of age and grade(s) appropriate strategies to enact in the lesson”, and “Produces and uses a variety of teaching and learning resources that enhance learning, including ICT”. The rest of the indicators recorded positive but marginal improvements. We highlight below some key reports from lesson observers and responses from students, especially related to competencies with the highest scores to provide insight into what is working well for teachers. Insights from lesson observers and regional monitoring teams are also provided for low-competency performances. The findings show that special efforts have to be made to address challenges faced by teachers while implementing NTS during lessons.

Table 3.34 Teachers who satisfied the criteria of sub-competencies in the lesson observation (%)

	Survey 2021	Survey 2022	Survey 2023
Teacher exhibits ethical teacher codes of conduct during the lesson delivery	73.2	69.4	79.4*
Creates a safe, encouraging learning environment	58.1	64.9	76.4*
The teacher listens to students and gives constructive feedback	57.8	63.4	70.4*
Understands how children develop and learn in diverse contexts and applies this understanding in their teaching	43.0	24.6	39.3*
The teacher demonstrates effective, growing leadership qualities in the classroom	26.9	24.6	36.3*
Teacher use of age and grade(s) appropriate strategies to enact in the lesson	23.0	31.3	41.9*
Explains concepts clearly using examples familiar to students	9.5	15.3	16.7
Produces and uses a variety of teaching and learning resources that enhance learning, including ICT	0.5	0.0	12.5*
Pays attention to all students, especially girls and students with special educational needs, ensuring their progress	6.9	9.3	12.3
Uses a variety of assessment modes during teaching to support learning	5.6	8.8	9.3
Employs a variety of instructional strategies that encourage student participation and critical thinking	2.8	6.8	9.3
Total (N)	391	399	389

*p≤0.05

Teacher exhibits ethical teacher codes of conduct during the lesson delivery

“Teacher exhibits ethical teacher codes of conduct during the lesson delivery” has been the best-performing competency since the inception of the LiT annual survey in 2021. For a teacher to demonstrate excellence in this competency, the teacher must arrive in class on time for the lesson; be dressed neatly, modestly, and decently; show respect for the students, including both males and females; and avoid exploiting students in class. As explained above, nearly 8 of 10 teachers demonstrated excellence in this competency, which is commendable. Lesson observers across the regions and schools reported similar observations of teachers being appropriately and decently dressed and also being polite to the students. In one instance, an observer reported that a teacher from the Ashanti region stood at the entrance of the classroom waiting for the students to enter the class after break. The teacher high-fived the students as they entered the classroom. This led to some excitement among the students when they entered the classroom. Another observer reported that a teacher who teaches a business programme came to class wearing a jacket and a tie. When he entered the class, the students hailed him and laughed heartily. The observer further said that the teacher reminded them to present themselves properly because they were business students. He encouraged them to wear a tie during his lessons.

Interviews with students also revealed some changes they had noticed in their teachers’ classroom behaviours. Students reported that the teachers have become more friendly and less antagonistic with them than previously. For example, a student from Mampong Presbyterian Secondary School said, *“... formally, some of the teachers came to class with frowns on their faces, and sometimes they showed anger, and it made us uncomfortable to ask questions. But now, when they come to class, you see them smiling. They now greet us with nice facial expressions, so the fear that we used to have for them has gone down. Now, anytime we see them coming to class, we become happy.”* Another home science student illustrated the changes she had observed: *“At first, some of the teachers will enter [the class] with frowns on their faces. From what I know, if you are having a problem at your house, you must not bring it to the students, but I think through PLC, they have changed their attitude towards us. They now enter with smiles. Some also kind of joke when they come so it is helping us.”*

Despite the positive observations across the regions, there were some reports from lesson observers that some teachers still came to class late with varying excuses. In most cases, these teachers did not apologize to the students for being late. About 12 percent of teachers arrived late to class. The maximum recorded time by the observers was 25 minutes. Upon enquiry from the observer, the teacher explained that he had sent his son to school in the morning, leading to the lateness.

Some officials of the regional monitoring team (RMT)³⁰ also cited various instances of teachers coming late to class during surprise visits to schools. The teachers could not articulate reasonable explanations for their lateness. In such cases, the RMT officials query the teachers and refer them to the heads of schools for monitoring and disciplinary actions where applicable.

Teacher creates a safe, encouraging learning environment

This subcomponent of the competency also noted a significant improvement of more than 7 of 10 teachers compared with previous surveys. As confirmed by lesson observers and students, most teachers have created an environment of comfort for their students, leading to most students being confident in asking questions when aspects of the lessons are unclear. The lesson observers cited various instances of teachers creating safe environments for their students during lessons:

- *“The teacher was full of praise for those who contributed in the lesson. He encouraged everyone to say something. The teacher was very friendly. Throughout the lesson, he didn’t shout at any student. Students could ask any questions without hesitation. However, the classroom was not spacious enough to enable students to be put into groups.”*
- *“She saw to the rearrangement of the classroom to suit the lesson for the day and this was done very neatly. Every student felt comfortable speaking during the lesson because she was very friendly and praised every good effort from the students.”*

The students also shared their experiences on how their teachers create safe and encouraging environments for them. For example, a student declared that previously, her math teacher did not care whether students passed or failed, leading her to lose interest in mathematics. She reported that the teacher currently shows interest in her studies and even her personal life through advice and suggestions on what she can do to improve her lessons. She continued by saying that the intervention by the teacher had motivated and encouraged her to take her lessons seriously and speak up if anything was unclear.

Despite the positive observations, a few lesson observers also cited instances where teachers did not create safe and encouraging environments for their students. The main points outlined by the lesson observers included instances of teachers shouting at students, incidents of teachers not encouraging students who provided wrong answers and incidents of teachers who showed impatience and

³⁰ The regional monitoring team are educational stakeholders set up as part of the LiT programme to conduct regular monitoring in SEIs and provide feedback to address challenges of the schools.

hurriedly ran through lessons. In one instance, an observer reported that: *“The students’ attitudes showed that they were afraid to answer questions. When the teacher asked a question, none of the students voluntarily raised their hands to answer except when the teacher probed them before they answered after they were called.”* Some of the students confirmed the points made by the observers. For example, a student cited an instance where a teacher shouted at her because she was unable to answer a question. She explained that it shook her and made her unable to follow the rest of the lesson.

The results of the 2023 survey also showed that teachers did not significantly improve on 4 of 11 components of NTS, although the survey recorded slight increments. These include *“Explains concepts clearly using examples familiar to students,” “Pays attention to all students, especially girls and students with special educational needs, ensuring their progress,” “Uses a variety of assessment modes during teaching to support learning,” and “Employs a variety of instructional strategies that encourage student participation and critical thinking.”* Despite the significant progress in the competency, *“Teachers’ use of a variety of teaching methods including ICT,”* it was still one of the least-noticed practices, perhaps because of the limited availability of ICT equipment in many schools. The paragraph below will highlight some of the challenges that have led to teachers’ low performance on some of these indicators and strategies to improve them.

With respect to *“Produces and uses a variety of teaching and learning resources that enhance learning, including ICT,”* the 2022 survey found that none of the teachers satisfactorily demonstrated competencies in that area. Almost 13 percent did so in 2023. Lesson observers reported a few instances where teachers either made references to or used ICT-related material in their lesson delivery. The observers explained that there were many instances where the integration of ICT would have been ideal for the lesson, but that was not done. Also, observers cited many instances where teachers had to use their personal mobile devices or laptops to teach the students, leading to delays in completing lesson targets. Interviews with teachers by observers revealed various challenges teachers face in integrating ICT into their teaching.

Teachers in several schools complained of unavailable electric sockets in classrooms. This prevents the use of digital resources. Other challenges cited by teachers include poor internet access and lack of training on the use of ICT. Further information regarding the use of ICT can be found in [section 3.9.6.3](#)



On the competency, *“Teacher pays attention to all students, especially girls, and students with special educational needs, ensuring their progress,”* lesson observers reported some progress among schools. For example, an observer in one school noted that the teacher formed groups to present on a topic, and the teacher deliberately made the slower students leaders in the groups and awarded points. In an interview with the teacher, he explained that ever since he started using that approach, he had seen significant progress among the slower students, hence his desire to continue that approach. Another observer reported that a teacher used an onion-ring pedagogy³¹ to ensure all the students participated in the class exercises. Other observers also commended some teachers for using other approaches to ensure that all the students participated actively. Despite the positives, observers reported some cases where teachers were still observed to be poorly demonstrating some competencies, including teachers not asking about students who were absent, ignoring quiet and reserved students who were not actively participating in class, teachers ignoring a section of the students disturbing and chatting at the rear of the classroom and teachers observed paying attention to only a few responsive students.

With respect to *“Teachers’ variety of assessment modes during teaching to support learning,”* different teaching approaches were observed. Many teachers were still using the *“question and answer”* assessment modes without varying it with innovative strategies to measure students’ understanding. Among the strategies witnessed, the most common were group presentations, peer assessments through games and, in minor cases, students voting on answers. Some teachers explained that they could not utilise innovative strategies due to large class sizes or classes with as few as seven students. Section 3 provides further information on assessment strategies adopted by teachers due to the introduction of PLCs in the schools.

Multiple regression was used to determine the relationship between the demographic characteristics and teachers’ NTS scores. Teachers with more than 10 years’ experience obtained significantly higher scores than teachers with less than 5 years’ experience (table 3.35). Teachers in mixed-sex schools obtained significantly lower scores compared with teachers in single-sex schools. The result of the regression model shows that years of teaching and the type of school a teacher teaches has an influence on their NTS scores.

Table 3.35: Output of multiple linear regression of NTS scores

Category	Coeff (*Sig)	CI
Sex		

³¹ In an onion ring strategy, students form an inner and outer circle facing a partner. The teacher asks a question and the students are given time to respond to their partner. Next, the inner circle rotates one person to the left. The teacher asks another question and the cycle repeats itself.

<i>Male</i>	Reference	
<i>Female</i>	.460	-2.147, 3.068
<i>Years of teaching</i>		
<i>Less than 5 years</i>	Reference	
<i>5 to 10 years</i>	2.802	-0.391, 5.996
<i>More than 10 years</i>	4.569*	1.524, 7.614
<i>School category</i>		
<i>Category A</i>	Reference	
<i>Category B</i>	-0.803	-5.549, 3.943
<i>Category C</i>	-0.920	-4.840, 3.000
<i>School sex</i>		
<i>Single-sex</i>	Reference	
<i>Mixed-sex</i>	-4.250*	-8.133, -.3672

* $p \leq 0.05$

3.9.5.2 Case studies of teachers who appropriately demonstrated NTS during their lesson delivery

The first case of a teacher demonstrating NTS appropriately was a male teacher from Opoku Agyeman SHTS in the Ashanti region. The topic for the day was elections and voting in Ghana. Based on reports from the lesson observer, the teacher reported to class on time and was professionally dressed. The teacher greeted the class, to which the students responded heartily amidst giggling from some students; this suggests that the teacher had a good relationship with the students. The teacher introduced the lesson observer as a visitor from GES to observe how they fared in class. According to the observer, the lesson was a follow-up to the previous lesson, which involved the students conducting a mock exercise of the electoral process in Ghana. The teacher, therefore asked them what they recalled about the previous lessons about elections in Ghana. The majority of the students raised their hands to answer the question. Interestingly, the teacher was patient and allowed most of the students to answer the question while also providing feedback and clarification on specific issues or topics that were not answered satisfactorily.



After the teacher explained the main objectives of the lesson, he nominated two females and one male to form three political parties with their party names. This caused excitement among the

students. The three political parties were the People's Party, the People's Economic Party, and the Development People's Party. He explained the reason for deliberately selecting two females as contenders by citing the importance of women's participation in the political history of Ghana. He also nominated a male student to act as the electoral commissioner tasked with supervising and overseeing elections. The teacher explained the functions of the electoral commissioner in detail and then the need for impartiality or non-biases. The teacher further asked the contenders to select their running mates and give them five minutes to prepare their campaign speeches.

The presentation of the speeches caused an exciting uproar which led students from other classes to stand at the windows of the class to observe. After the campaign messaging was completed, the teacher allowed the students to ask them questions based on the policies they presented. Later, the teacher asked the electoral commissioner to set up make-shift booths for the election. At each vital part of the lesson, the teacher explained various aspects of the electoral process for students to understand. After the first round of voting, none of the parties could secure the fifty-plus-one requirement, which led to a run-off among the best two parties. After the re-run of the election, the electoral commissioner counted the ballots.. At the end of the lesson, the teacher highlighted the key points and lessons from the processes and asked them to pay key attention during the Ghana elections in 2024.

3.9.5.3 Case study of a teacher who did not appropriately demonstrated NTS during their lesson delivery

A lesson observer recorded a case in the Ashanti region where a teacher did not appropriately demonstrate NTS during his economics class; the topic was profit and loss. According to the observer, the teacher reported to class early and was professionally dressed. The observer noted that when the teacher started his lesson, the students' attitude showed that they did not respect the teacher. This is because the teacher was ignored most of the time when he asked questions, and the students showed disinterest in what he was teaching. Worse, the teacher said to the students that he had noticed they were not making a lot of noise *"because there was a visitor from GES in the class,"* referring to the observer. The observer further recorded that the teacher seemed unprepared for the class as he regularly referred to his mobile phone when explaining concepts to the students. Only a few responded when he asked whether the students understood, and the rest murmured. He only told them to be serious because *"You are not learning for me. You're learning for yourself. So if you are not serious, it is your own loss."*

According to the observer, the teacher called only one student to the board to answer the questions he had written on it. While the lesson was ongoing, the students at the back seemed disinterested

and kept chatting among themselves over the course of the lesson without the teacher drawing their attention or interjecting. About halfway into the lesson, the teacher wrote some exercises on the board and asked the students to complete them and submit them to him for marking. The observer reported that the teacher neither provided a summary of what had been taught during the lesson nor ensured all the students had understood the topic.

3.9.5.4 Qualitative findings on teachers' demonstrating an understanding and application of the NTS

Teachers' awareness and knowledge about NTS

Compared with the 2021 and 2022 surveys, all the teachers are aware of NTS mainly through the PLC intervention in schools. Teachers confirmed that they had received copies of NTS handbooks.

Interviews with teachers for the 2023 survey revealed insight and knowledge about the NTS, its domains, and its components. While many could not recall every section or subsection of the NTS, the teachers could paraphrase and recall key aspects they perceived as vital. The qualitative sections below highlight key aspects of how some teachers apply NTS during their lesson delivery, how teachers assess and support students, the challenges teachers face in implementing the guidelines of the NTS, and recommendations from teachers on ways to better improve the use of NTS in schools. The section also provides students' perspectives on the introduction of new teaching strategies during lesson delivery by their teachers and how it has affected their learning and development. The section also provides some observations and comments from regional monitoring team members interviewed as part of the 2023 survey.

How teachers apply NTS during lesson delivery

In previous surveys, teachers attributed their inability to demonstrate NTS to their lack of knowledge about the NTS. Following the introduction of PLCs in SEIs, teachers across the country have received training from GES with technical support from T-TEL in trainers--or through PLCs in their schools. Generally, teachers who participated in the surveys provided positive feedback about the introduction of PLCs in their schools because it has enabled them to learn new strategies and pedagogies to help improve their personal development and their students' performance.

The use of icebreakers to improve student participation

One of the most common themes that teachers have adopted in their classrooms is the introduction of ice-breakers. Teachers stated that to avoid the class being dull, they have introduced various

mechanisms to engage the students and make them more active. For example, some teachers have introduced songs before, during, and at the end of the lesson. Other teachers also stated that they introduce the songs and fun games only when they notice that the classroom has become dull or when the students seem inactive due to tiredness.

Use of digital technologies and low-cost-no-cost teaching and learning materials

Another noticeable change observed was the use of ICT and digital technology among teachers. Teachers explained that the use of digital technology has helped students to understand lessons better and has increased engagement and interactivity. Teachers confirmed that the idea of using digital technology and related resources was emphasized during PLC sessions. A number of teachers also reportedly used low-cost and no-cost teaching and learning resources during



their lesson delivery. For example, a teacher who was teaching pollination brought flowers to class to demonstrate how pollen is transferred from one plant to another. Another teacher brought food crops to demonstrate the different kinds of nutrients they provide.

Some members of the RMT also confirmed the use of low-cost and no-cost TLMs. For example, an RMT member reported that a *“math teacher was looking for a compass. There was a wooden compass with a nail at the pinpoint nail that they use, and it worked perfectly like the normal compass that the students use. Those ones are.”*

The findings from teachers were verified during focus group discussions with students. Students who participated in the group sessions confirmed the introduction of ICT and digital technology in their lessons across the regions. Students at a school confirmed that at least once a week, the students are required to visit the ICT lab for e-learning. According to the students, e-learning is based on subjects and is done to aid students who have peculiar challenges with their studies. A student reported that *“what has been instituted is that every week for each class, we have at least once a week, we have e-learning. This is electronic. So, we go to the ICT lab. We have videos of teaching, more like an e-learning session. So, we go to the ICT lab based on our classes. So, this week, we have mathematics, e-learning, next week, science. It is done so that students who learn through visuals can grasp certain things easily.”*

Use of innovative pedagogical strategies

The 2023 survey witnessed significant progress in the use of pedagogical strategies by teachers across all regions. Most of these teachers in interviews indicated that the strategies were learned through their PLC participation in their schools. Lesson observers and members of the RMT also reported teachers using these strategies. During focus group discussions, students also confirmed their teachers' use of these strategies. According to teachers, the most common strategy they use is differentiated learning³². They further confirmed that the most common activities they use to implement this strategy are group formations, the use of onion-ring strategies, pyramid and triangular discussions, and the use of think-pair-share³³ activities. Some of the teachers further clarified that based on discussions through PLCs, they had modified the think-pair-share approach to include sharing findings verbally and writing down the findings; hence, the name changed to think-pair-share-ink.



Across the schools visited, the most common differentiated learning strategy was the mixed-abilities grouping method. The observers reported that students formed in groups, made presentations and answered questions from their student colleagues. This, they confirmed, led to an observably high level of interactivity, seriousness, and fun during lessons. For example, a teacher in the Central region said, *".....I also use it. Initially, when I was talking, I was talking about pairing. I group students based on their abilities. That is, I mix those who are good with those who are not good. I mix them so that they all share ideas. And it has helped because formerly, some of the students would never open their mouths no matter what you do. But now, because of this approach, they all talk in class, so it's good."*

³² Differentiated learning is a teaching approach that tailors instructions to students based on their proficiency levels, learning needs and abilities.

³³ Think-pair-share is a collaborative learning strategy where students work together to solve a problem or answer a question about an assigned reading. This strategy requires students to think individually about a topic or answer to a question; and share ideas with classmates.

Students also shared their perspectives about their teachers' adoption of these new teaching strategies due to the positive impact it has had on their learning. Generally, all the students provided positive feedback based on their experience and recommended a permanent adoption of this teaching method to aid their learning.

Student motivation and reward schemes

Beyond the use of new pedagogies, a few teachers have developed personalized strategies that they indicated work for them. For example, a teacher said that if he gives exercises to his students, he writes motivational messages in their exercise books and assignments based on their performance to encourage them. He cited an example where a student failed in an exercise, and he wrote in his exercise book after the marking, *"You did not do well in this exercise but don't give up, I was in your situation, so continue to work hard, and you will make it."* He further stated that he follows up with remediation measures based on their weak areas.

Another teacher also said that he personally buys exercise books, pens, and less expensive items and rewards students based on their efforts in class. He indicated further that since he started that, he had seen improvement in their performances and attention when lessons were ongoing.

Strategies teachers use to assess students' understanding during lessons

In key informant interviews, teachers explained various strategies to assess student understanding during lesson delivery. It is important to note that these strategies are not mutually exclusive from the innovative pedagogical strategies explained in the earlier paragraph. A component of the differentiated learning approach entails elements of student proficiency determination before groupings are done. As explained by most teachers across the regions, the most common strategies they use to assess students' understanding include oral assessments, class exercises, quizzes, and assignments. Teachers also confirmed using group exercises, presentations, and projects to determine their students' proficiency and understanding. Some teachers further suggested that they use the students' body language, level of interactivity, and enthusiasm to assess their understanding.



Students from Taviefe Community SHS engaged in a group exercise

As part of the findings, a few teachers indicated that they require students to identify specific challenges during a lesson so the teachers could tailor remediation that is applicable to each student. This information was also confirmed by a student who said that his teachers implement a *self-improvement scheme (SIS)* in which the teachers are required to list their challenges for remediation. The student said, *“And then for our class, our teacher implemented something called the SIS, where when he poses a question or the class fails to understand a particular topic, you have a paper, and then you are to write basic things that you have to know about the topic. What you understand, what you don’t understand, everything. And then how you think he should teach to improve upon your understanding. So that’s the SIS that our teachers implement.”*

A few teachers also said that as part of assessing their students’ understanding of a topic, they develop questions at different difficulty levels. They begin asking the easiest questions and assess the responses provided by the students. They then follow up with increasingly more difficult questions until they exhaust the set questions. They indicated that this approach helps them determine the students’ proficiency levels to develop an appropriate remediation for them individually or as a group. They further elaborated that they sometimes use this approach to help group the students for projects and exercises.

Some teachers also reportedly used the *“activity ball”* assessment method. With this approach, the teacher would throw a ball to a student randomly and ask a topic question. If the student could not answer, the student would also throw it to a different student to answer the same question. If a student was able to answer the questions, the cycle would start again with a different question until all questions had been answered by almost all the students in the class.

Lastly, a few of the teachers also said that they had introduced surprise quizzes to assess students’ understanding of the lessons taught. They said that the surprising nature of the quizzes always makes the students more attentive during lesson delivery.

Challenges in implementing NTS during lesson delivery

While several teachers were observed attempting to implement aspects of the NTS, a proportion of the teachers did not implement relevant aspects of NTS during their lesson delivery despite their knowledge about NTS and participation in PLC sessions. Based on interviews with the teachers, various reasons and challenges were cited for the non-implementation of NTS. Some of these are discussed below:

Lack of adequate resources, including ICT and digital technologies

One of the most common complaints received from teachers is the inadequacy of ICT and digital technologies.. According to the teachers, these challenges prevent them from implementing NTS.

A few teachers further stated that they do not fully understand how to properly implement the NTS. Upon further probing regarding their participation in PLCs, some claimed that they had missed a few sessions and would make time to attend in the future. One teacher stated that despite having copies of the NTS handbooks, he had deliberately not paid particular attention to them. He said, *"I'm still studying the NTS. I have not studied the NTS in detail to understand what they actually entail. It is only during PLC that when I go sometimes, they make references to the NTS and ask questions. I will try and make time to study NTS and attend the PLC."*

Regarding teachers who knowingly avoid participating in the PLCs or implement the provisions of the NTS during their lessons, members of the RMT were asked about the remediation or deterrent measures they put in place to enforce teacher participation.; some RMT members explained that when they receive such reports from heads of schools, facilitators or during their monitoring, the teachers involved are asked to report to the regional education office to explain their reasons for non-participation. The RMT members also noted that teachers who do not prepare and submit lesson notes are invited to report to the regional office to be reprimanded.

A few of the teachers complained that they were unable to implement the key aspects of the NTS, specifically the group exercises because the activity consumed a lot of time. The teachers who have large classes emphasized this point. They explained that trying to go through the entire strategies is inefficient for them, leading to an inability to complete the day's lesson plan due to the slow pace of grouping exercises. Some further stated that using the differentiated approach is tedious due to deliberate efforts to ensure all students understand. While explaining his challenges with implementing the differentiated learning approach, a teacher said, *"..... trying to design a lesson that will take care of the learning styles of all students is a challenge. It is not easy to do that. But when you check the NTS, we are required to do that. To ensure that if a particular student can only learn through visuals, you must provide it. Others will have to learn by hearing. You have to make an audio of it and all that. So it is not easy to integrate all these things into one lesson. So, that is a major challenge I face as a teacher. "*

3.9.6 Teachers in SEIs using digital technologies to enhance their teaching

3.9.6.1 Percentage of teachers using digital technologies to enhance their teaching

The indicator measures the extent to which digital technologies are used to support and enhance learning in a multitude of ways and with a hands-on approach for students. Digital technologies include electronic tools, systems, devices, and resources that generate, store, or process data. Well-known examples include social media, online games, multimedia, and mobile phones. As part of the data-collection process, three assessment tools were used. First, sampled teachers were observed using

or referencing digital technologies during lessons based on the measurement criteria (see box 3.2). An interview was also conducted with teachers to triangulate the results of the lesson observation. Finally, students completed a self-assessment to triangulate the results of the lesson observations. For a teacher to meet the minimum criteria for this indicator, a minimum of 75 percent average score is required.

The results show a significant improvement from the 2022 results. While none of the teachers demonstrated the satisfactory use of digital technology in the 2022 survey, 7.7 percent of teachers demonstrated the use of digital technology in 2023.

Box 3.2 Observation criteria for the use of digital technologies

- Relevance of ICT to curriculum and topic taught.
- Teacher uses digital technology to support learning in a multitude of ways, a hands-on approach for learners.
- Gives appropriate resources to students with special needs.
- Produces and uses a variety of teaching and learning resources that enhance learning, including ICT.

Table 3.36-1 Percentage of teachers in SEIs using digital technology

	Survey 2022	Survey 2023
Sex		
<i>Male</i>	0	8.8*
<i>Female</i>	0	4.7*
School category		
<i>Category A</i>	0	3.8*
<i>Category B</i>	0	7.5*
<i>Category C</i>	0	8.6*
School sex		
<i>Mixed-sex</i>	0	7.8*
<i>Single-sex</i>	0	7.4*
Overall	0	7.7*
Total (N)	399	389

*p<0.05

Table 3.36-2 highlights the performance of teachers since the inception of the Lit programme. As highlighted in the table, teachers’ performance progressed significantly in 2023 compared with the results in 2021 and 2022.

Table 3.36-2 Progress in teachers’ demonstration of digital technology use in their lessons

	2021	2022	2023
Excellent demonstration	0.0	0.0	7.7*
Good demonstration	28.1	29.9	35.2
Fair demonstration	61.1	58.7	51.7*
Poor demonstration	10.7	11.4	5.4

*p≤0.05

Table 3.36-3 presents the proportion of teachers who met the minimum criteria for competency with ICT and digital technologies. Similar to the 2022 survey, few teachers obtained the minimum criteria in all the competency areas, except for “relevance of ICT to curriculum and topic taught,” which increased from 9.8 percent in 2022 to 19.8 percent in 2023. The use of a variety of teaching and learning materials, including ICT, also increased significantly to 12.5 percent in 2023.

Regarding integrating online platforms into students’ learning, a teacher from Mampong Presbyterian SHS indicated that he had introduced his students to Google Classroom, where he gives exercises and projects. He said in an interview, *“I started with a program with them, which is a Google Classroom, where we hook some of the students onto the Google Classroom. I like this particular platform because it’s a way of using ICT directly. Students are able to do an assignment online. But the challenge is that students are not allowed to use mobile devices, and the ICT lab is not always available for them to use.”*

Table 3.36-3 Teachers who met the minimum criteria on the use of ICT and digital technologies (%)

	Survey 2021	Survey 2022	Survey 2023
Relevance of ICT to curriculum and topic taught	5.4	9.8	19.8*
The teacher uses digital technology to support learning in a multitude of ways, a hands-on approach for students	0.3	1.3	3.3
The teacher gives appropriate ICT resources to students with special needs	14.3	10.0	14.1

Produces and uses a variety of teaching and learning resources that enhance learning, including ICT.	2.1	0.0	12.5*
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*p<0.05

The results from the teacher survey showed no significant difference between the proportion of teachers who claimed to have received training in 2022 and 2023 (table 3.37). The teachers indicated that they received training on methods to utilize digital technology to enhance their personal development and not on integrating it into their classroom lesson delivery.

Table 3.37 Proportion of teachers who have received training in digital technologies in their schools (%)

Category	Survey 2021	Survey 2022	Survey 2023
Sex of teacher			
<i>Male</i>	23.3	41.0	44.3
<i>Female</i>	25.6	45.2	45.3
School category			
<i>Category A</i>	35.4	45.4	32.4
<i>Category B</i>	22.0	44.1	36.8
<i>Category C</i>	22.7	39.8	48.2
School sex			
<i>Mixed Sex</i>	24.0	41.5	31.8
<i>Single Sex</i>	22.1	46.2	45.8
Years of Teaching			
<i>Less than 5 years</i>	21.1	41.6	38.2
<i>5 to 10 years</i>	24.9	42.5	44.9
<i>More than 10 years</i>	25.2	42.1	46.7
Overall	23.9	42.1	44.5

Multiple regression was used to determine the relationship between demographic characteristics and teachers' ICT indicator scores. Based on the output results in table 3.38, the overall regression model was not significant at 0.05 (i.e., Prob > F = 0.0806). Therefore, the independent variables cannot appropriately predict the competency scores of the ICT indicator.

Table 3.38 Output of multiple linear regression of NTS scores

Category	Coeff (*Sig)	CI
Sex		
<i>Male</i>	Reference	
<i>Female</i>	-2.000	-4.174, .171
<i>Years of teaching</i>		

Category	Coeff (*Sig)	CI
<i>Less than 5 years</i>	Reference	
<i>5 to 10 years</i>	.934	-1.727, 3.595
<i>More than 10 years</i>	-.779	-3.317, 1.757
School category		
<i>Category A</i>	Reference	
<i>Category B</i>	2.375	-1.579, 6.330
<i>Category C</i>	1.805	-1.461, 5.072
School sex		
<i>Single-sex</i>	Reference	
<i>Mixed-sex</i>	-4.037*	-7.27, -.801

NOTE: Prob > F = 0.0806

*p≤0.05

3.9.6.3 Qualitative findings on teachers' demonstrating use of digital technologies

The introduction of PLC drove the usage of digital. Introducing digital technology is a key intervention in secondary education reform. It aims to imbibe in students 21st century knowledge and skills to adequately prepare them for the world of work and to improve their critical thinking and problem-solving skills. Teachers have welcomed the integration of ICT into teaching and learning, with some teachers adopting the approach in their teaching. Having established the adoption and use of digital technologies in previous sections, this segment will provide information on how teachers conduct research to prepare their lessons using digital technologies.

Teachers who conduct research using digital technologies

In a less-than-expected turn, not many teachers reported going online to find materials to prepare their lessons. The majority of the teachers who do mostly use their mobile devices and laptops for their research. A few teachers cited the specific platforms and websites they visited to research and collate lesson materials. Many of these teachers cited YouTube as the most common platform they visit for materials. Some teachers also mentioned Google as the most common search engine to search for information especially if they do not know the specific websites to visit. A few teachers also mentioned websites like Khan Academy, Kahoot! and Intermaths.

"For instance, I spoke about the videos I show to students in the classroom. The videos I show to students in the classroom are primarily from YouTube. Sometimes, I also use other learning platforms, like Khan Academy, to prepare my lessons. They have a lot of videos and simulations on some of the things we teach in our curriculum. And you sometimes need some skills to organize a PowerPoint presentation and so on. We get all those resources online."

"I am a fan of going to the internet to get a lot of information I have a lot of mathematical sites that I visit in my lesson preparation. For example, you go to a site called www.intermath.com it's an international mathematics platform. When you go there, you have a lot of amazing materials. Also, YouTube is a platform that I recommend to the students. I advise them that when they go home, instead of using their phones, chatting, and all those kinds of things. They should go to YouTube and see people using different kinds of approach to establish the same concept to bring variations to their understanding"

An interesting finding from the interviews was that a few teachers confirmed they had formed WhatsApp groups to help support and engage their students. They explained that because students are not allowed to use mobile devices in school, the WhatsApp group is active during vacations or holidays when the students are home. They further said the platform allows the students to ask questions and seek clarifications while studying at home. As one teacher commented: *"Regarding the underperforming students, I give them reading assignments from time to time, on the page, especially during vacations, so that they can read to improve their English."* Another teacher also said: *"I have a WhatsApp group for my students. Usually, during vacations, I put some topics in it to generate discussions. This helps to keep the students on their toes and revising always."*

Reasons why teachers do not use digital technologies during lessons

Some teachers do not understand digital technology's proper use and application. They perceive that using digital technology only entails showcasing laptops and projectors or showing classroom videos on television. Lesson observers reported various instances of teachers who did not reference ICT and digital materials despite the lesson topic requiring it. In interviews, teachers explained that they were unaware of how to apply device-based ICT materials. Observers reported citing examples such as digital pictures, posters, references to websites, and other electronic devices as aspects of the use of digital technology, but some teachers did not know they entailed ICT usage. The enumerator's observation was confirmed by members of the RMT, who reported several instances where they had observed teachers not making references to digital materials. In an interview, an RMT member said, *"ICT is an issue. Most of the time, teachers or schools think that if you say incorporate ICT into teaching, it's having a projector and slides that you project in the classroom for students to see. But most of the time, we draw teachers' and even management's attention to the fact that ICT is not only about projectors. Even using a calculator is part of the incorporation of ICT. Sometimes, a teacher can hand over a phone to a student to search for something. A teacher can even search for something online and then try to make a reference to this. So, incorporation of ICT is another issue, but then gradually, things are improving."*

Another key challenge cited by teachers involves the purchase of data to use for their research. They explained that the lack of wireless networks in the schools requires them to use their resources to find information, which they perceive as unfair given the effects on their expenditure. Poor network

coverage was given by other teachers as challenges they faced in using digital technologies. Some quotes from teachers are cited below:

"The first challenge is that the government has provided every secondary school with internet connectivity. But as we speak, my school, and all other schools in the area, have no connectivity. So, using the search engine becomes private. You have to find it yourself using your own resources."

".....Data are expensive now, especially Mobile Telecommunications Network (MTN). And you can't rely on the internet in the school, so if you want to really do a good job by going online for information and material, especially videos, you have to buy your own data, which is not good. The salary is small, and if I have to buy data to do my work, too. That's not good."

Teachers also mentioned challenges with the adequacy of infrastructure. In a few instances, some teachers explained that some ICT labs do not have sufficient computers, given the large number of students in the schools. The low number of computers becomes a hindrance when students are asked to conduct research for their group work. A teacher commented as follows: *"I think, another area that we think government or any other organization can help the school is giving us the necessary tools so that we can integrate ICT in our lesson. If you look at the ICT lab, we have only 15 functional computers. The rest are down. So how will you integrate ICT with only 15 computers? Having a class of 55 students. So, if they can support us to get the necessary ICT tools, it will help us a lot."*

Teachers also cited various challenges they face in integrating ICT and digital technology in their lesson delivery. Here are some challenges::

- *"Our challenges are many. You can talk about laptops, you can talk about even Internet connectivity. You can talk about a whole lot of things. Common graph board. We don't have it. A graph board. And you want to teach maybe geometry, you want to teach reflection. Teachers have to always innovate with their hand. And so, as we are talking about 21st century teaching and learning skills, We must equally get 21st century tools to impact our teaching and learning."*
- *".....it is my recommendation that our traditional classrooms be looked at. Because in the 21st century, we are expected as 21st century teachers to use ICT tools in teaching and to incorporate ICT into our lessons. So if our classrooms are there without sockets, how could it help us to digitalize our lessons?"*

" For me, I can say that the quality of internet access in this school is very, very poor. It's very poor because, first of all, the number of computers we have in our ICT lab, there are less than 15 computers. And the population is over a thousand. So, if we are to do, let me say, internet-based topics, when we get there, the computers don't work."

3.9.7 Teachers demonstrating GESI-responsive pedagogies

3.9.7.1 Percentage of teachers demonstrating Gender Equality and Social Inclusion (GESI) responsive pedagogies.

This indicator tracks teachers' demonstration of gender-responsive pedagogy using the criteria shown in box 3.3³⁴.

Three different tools are used to collect data for measuring the GESI indicator.

To determine the mean percent composite score for a teacher, the three tools are triangulated, and a score is assigned based on the teacher's performance.

For example, for the lesson observation, if a teacher obtains an average score of 3.2 of 4 (the maximum score attainable), this will be equivalent to $3.2/4 \times 100$ or 80.0 percent. For the teacher interview, if a teacher attained a total score of 45 of 63, this would be equivalent to $45/63 \times 100$ or 71.0 percent. For student triangulation, if students had an average score of 2.8 (of 5), this would be equivalent to $2.8/5 \times 100$ or 56.0 percent. Therefore, the composite score for the indicator would be $(80+71+56)/3$ or 69.0 percent.

Table 3.39 presents the proportion of teachers who demonstrated GESI-responsive pedagogies in their lessons. The results show a significant improvement in teachers' demonstration from 11.5 percent in 2022 to 21.1 percent in 2023, this shows a near two-fold increase.

Interestingly, 17 of the 50 schools interviewed had at least one teacher satisfying the GESI criteria. Also, for the first time, two schools recorded a perfect score with regard to teachers demonstrating GESI, Afife Senior High Technical and Tanyigbe SHS, both in the Volta region. Over 80 percent of teachers in

Box 3.3 GESI-responsive instructional strategies

- ❖ The teacher applies all teaching methods equally to male and female students
- ❖ The teacher uses gender-responsive strategies to challenge gender roles and norms
- ❖ Creates a safe, encouraging learning environment
- ❖ Pays attention to all students, especially girls and students with special educational needs (SEN), ensuring their progress.
- ❖ Employs instructional strategies appropriate for mixed ability, multilingual and multi-age classes.
- ❖ Understands how children develop and learn in diverse contexts and applies this in their teaching

³⁴ In calculating the indicator, three methods were employed to provide a composite score: lesson observation, a follow-up interview with teachers, and self-administered questionnaires with students. The computational procedure is similar to the process used for the NTS. As a recap, after the three tools are averaged to provide a mean composite score, a teacher is expected to obtain a minimum of 75 percent on the mean composite score to satisfy the criteria of the indicator.

Esiama Senior High/Tech, Jacobu Senior High/Tech, Krobo Community SHS,, Uthman Bin Afam SHS, and Northern Star SHS demonstrated GESI-inclusive instructional strategies..

Table 3.39 Percentage of teachers in SEIs demonstrating GESI

	Survey 2021	Survey 2022	Survey 2023
Sex			
<i>Male</i>	7.6	9.8	20.9*
<i>Female</i>	11.7	14.5	21.7*
School category			
<i>Category A</i>	6.3	7.1	13.2*
<i>Category B</i>	7.0	10.1	22.4*
<i>Category C</i>	10.6	13.5	22.4*
School sex			
<i>Mixed-sex</i>	9.5	12.5	22.1*
<i>Single-sex</i>	0.0	0.0	15.1*
Overall	8.7	11.3	21.1*
Total (N)	391	399	389

*p<0.05

Table 3.40 highlights the performance of teachers since the inception of the LiT programme. As highlighted in the table, teachers’ performance progressed significantly in 2023 compared with the results in 2021 and 2022. The progress is most notable in the reduction of the proportion of teachers who fairly demonstrating GESI (by about 12 percent) and the increase in the proportion of teachers whose demonstration of GESI was excellent (by about 10 percent).

Table 3.40 Progress in teachers’ demonstration of the GESI in their lessons (%)

	2021	2022	2023
Excellent demonstration	8.7	11.3	21.1*
Good demonstration	55.0	53.1	57.7
Fair demonstration	33.5	33.6	21.1*
Poor demonstration	2.8	2.0	0.0

*p<0.05

Table 3.41 details the percentage of teachers who met the criteria for the teacher competency scores. As shown in the table, significant improvements were recorded for six of eight competency areas. The competency area with the highest scores was “*Creates a safe, encouraging learning environment,*” followed by “*The teacher applies all teaching methods equally to female and male students.*” With respect to teachers’ “application of teaching methods equally to female and male students”, the criteria require that teachers demonstrate that they give equal chances to all students to ask questions. They must also assign leadership roles equally to girls and boys in lesson activities. Teachers must also ensure that both male and female students participate equally in activities and

treat both sexes equally when providing feedback. The lesson observers reported that most teachers were observed involving male and female students in group work and projects. For example, an observer noted that while assessing students' understanding, the teacher asked one male a question followed by a female and vice versa throughout the lesson.

Table 3.41 Teacher competency scores on GESI-responsive pedagogies (%)

	Survey 2021	Survey 2022	Survey 2023
Creates a safe, encouraging learning environment	58.1	64.9	76.4*
The teacher applies all teaching methods equally to female and male students	44.0	47.4	57.8*
Understands how children develop and learn in diverse contexts and applies this in their teaching	43.0	24.6	39.3*
Teacher use of age and grade(s) appropriate strategies to enact in the lesson	23.0	31.3	41.9*
Identifies and remediates learners' difficulties or misconceptions, referring learners whose needs lie outside the competency of the teacher	22.3	18.3	25.2*
The teacher uses gender-responsive strategies to challenge gender roles and gender norms	12.3	9.3	14.1*
Pays attention to all students, especially girls and students with SEN, ensuring their progress	6.9	9.3	12.3
Employs instructional strategies appropriate for mixed ability, multilingual and multi-age classes	6.9	9.3	12.3

*p≤0.05

Observers further reported that in some schools, the teachers encouraged shy and nonparticipating female students to ask questions and handled them with patience. Similar reports by observers are shared here::

“Students who felt shy, particularly female students, were motivated to participate in the lesson activities. The environment was conducive [to learning], and the teacher was friendly, enabling the learners to be fully part of the lesson. Both genders participated fully in the lesson without being discriminated against.”

“Almost all the students were involved in the lesson activities. The teacher had time and patience for every student to present his/her response. No learner felt intimidated in any way to take part in the lesson. The teacher presented oral feedback to the students. He wrote some questions for the students to answer as an assignment.”

In most of the schools visited, not many teachers reported having students with special education needs (SEN) in their classrooms. For those who did, some made attempts to involve them in activities in the classroom. A lesson observer reported that, in one instance, a student in a wheelchair was not participating actively in the group activities. Upon enquiring from the teacher in a later interview, he explained, *“About the physically challenged student. It is very difficult because he’s in a wheelchair. So, for him, for every group movement, he has to move it there. Sometimes, it’s very difficult to assign him to a group. You need to also concentrate on the other students so that they see him as part of them. So, those are some of the challenges that we do have.”* The lesson observer later explained to the teacher that, in later lessons, it would be more convenient to organize the group around where that student is to avoid him having to move around during lessons. The teacher agreed to implement this approach.

Another observer noted that a student with SEN was not actively participating in class. In a later interview, the teacher explained that the student frequently missed school and was behind on the lessons due to his condition. He further explained that he regularly organises private lessons based on the student’s needs to ensure that the student is informed of missed lessons. In other schools, teachers said that they pay special attention to students with SEN. In an interesting finding, a teacher confessed that before the PLC was introduced, he had difficulty identifying and providing support to students with SEN despite receiving training at the college. However, due to his participation in PLC, he has now obtained the knowledge required to teach students with SEN.

Multiple regression was used to determine the relationship between demographic characteristics and teachers’ digital technology scores. Based on the output results in table 3.42, the overall regression model was not significant at 0.05 (i.e. Prob > F =0.2851). Therefore, the independent variables cannot appropriately predict the competency scores of the indicator.

Table 3.42 Output of multiple linear regression of NTS scores

Category	Coeff (*Sig)	CI
Sex		
Male	Reference	
Female	.3821	2.556, 3.320
Years of teaching		
Less than 5 years	Reference	
5 to 10 years	1.931	-1.667, 5.529
More than 10 years	4.086	.659, 7.514
School category		
Category A	Reference	
Category B	-1.244	-6.600, 4.111
Category C	-1.010	-5.442, 3.420
School sex		

Single-sex	Reference	
Mixed-sex	-1.216	-5.638, 3.204

*p≤0.05

3.9.7.2 Case studies of a teacher who appropriately demonstrated GESI during their lesson delivery

The case study of a teacher who appropriately demonstrated GESI was recorded in the Upper West region. The lesson observer reported that the lesson for the day was on “*Article Writing*” in English language for Form 1 students. The observer reported that the teacher came to class on time and greeted the students with a smile. The students were receptive and smiled back at the teacher with some of the male students mentioning and hailing the nickname of the teacher. The teacher explained the objectives of the lesson and told the students that he would adopt a group exercise approach to conduct the lesson.

The teacher mixed the students equally with the same number of male and female students in each group. The teacher told each group to provide a list of “*features of an article.*” He encouraged them to use the think-pair-share approach to discuss the exercise. After each group had completed the exercise, he invited the teams to present their findings to the class. After each group was done with their presentation, the teacher used the activity ball approach to assess their understanding. He did that by throwing a ball to a female student first and asked a question. He encouraged the students to throw the ball to the opposite sex. For example, if a ball was thrown to a female to answer a question, the female was required to throw it to a male student, followed by another female student and vice versa. Using this approach, all the students in the class got the opportunity to answer questions or ask questions on the lesson for the day.

3.9.7.4 Qualitative findings on teachers’ demonstrating GESI-responsive pedagogies

Among all the LiT programme indicators evaluated, GESI recorded the most significant improvement from the baseline, as explained in the quantitative data. The introduction of the PLC contributed to the progress in the GESI score. This was confirmed by many of the teachers interviewed. Stakeholders also confirmed that the term “GESI” had become a household name in many of the schools, to the extent that some teachers have adopted it as a nickname. The members of the RMT also confirmed this finding. For example, an RMT member from the Savannah region explained that in some schools that he regularly supervises, the school has set up a GESI committee led by the head of the counselling unit to address all GESI-related issues in the school; this includes ensuring teachers adhere to the practices in the classroom. The RMT member said, “*So, that has become like a household name to the extent that sometimes, they even label each other as GESI-responsive teachers. So, I have realised that the teachers have embraced it. Even most of the schools we visited have a specific committee for GESI called the GESI committee, mostly headed by the counselling committee. They ensure that they validate the GESI activities. So, they go around to ensure that each teacher is*

responsive to the needs of the elements within the GESI concept.” Other RMT members also said that as part of their objectives for visiting schools, they pay particular attention to ensuring teachers implement GESI in the classroom. Most of the RMT members pointed out that when they notice a teacher not implementing the GESI requirements as stipulated, they advise them and give them strategies to help them implement GESI. On this point, an RMT member in the Western North region said, *“So, for example, when you observe a teacher and realize in his teaching, there was no deliberate attempt to bring gender into his or her teaching. You speak with the teacher. You go back to management. You tell them that when they also go on their regular supervision of their teachers, they should drum that home so that everybody will be involved so that teaching and learning can be improved.”*

Interviews with teachers revealed significant knowledge about GESI among teachers, including those who did not appropriately implement them during lesson delivery. Most of the teachers could explain the concept of GESI and the strategies that can be used to demonstrate it in the classroom. It was notable that most of the explanation provided on the concept of GESI mainly focused on treating males and females equally, with a few spontaneously mentioning disadvantaged students and those with special education needs. The quotes below highlight some of the views of teachers about GESI:

- *“To the best of my understanding, when I talk about gender equality and social inclusion, here we are giving equal treatment to all students, irrespective of their gender, whether male or female, whether their parents are wealthy or poor, whether the tribe that they belong to. You see, gone were the days when only boys were assigned to be class captains and then blackboard cleaners and girls were also assigned to sweeping. Nowadays, you are giving equal treatment to all. So a boy can be assigned to sweep. A girl can also be made a class prefect. So that is my understanding about the GESI.”*
- *“GESI, I understand it this way. In teaching, we don't need to stereotype. We don't need to wash some group of gender off. That, oh, that's what this lady, she's bad, she's black-headed and blah, blah, blah. All we need to do is include everybody. There should be fair sharing. Even if it's a mathematics or ICT-oriented subject, we should allow the ladies to have their fair share. The guys should not always be given the advantage. If it's about leadership roles, we should bring everybody on board. So in our school, we have girls' prefects. Sometimes, even when you go to the classrooms, you have class prefects who are only ladies. We don't have guys. Personally, with the class that I handle, most of the time, the girls are even more than the guys, so I don't have a problem at all with that one. When I assign them to exercises and assignments, sometimes the group leaders are always ladies.”*

- *“I would say it’s one of the cross-cultivation issues that ensures inclusive and equitable education and promotes lifelong opportunity. So further explanation is if you go to class, as a teacher, you must be able to do a mixed grouping according to their abilities, their gender, their experiences, their background, and so on. If you go to class, you may see girls are sitting at their side, boys are sitting at their side. That is according to the gender. So, you mix them up. And secondly, you may go to a class where some of them may not understand English, the language you are using. So, you have to even get an interpreter in the class. So, when you talk, you also interpret what you say to them so they may understand. I think that is also part of the gender responsiveness application.”*
- *“Gender equality seeks to ensure that all genders are treated equally. All genders are given equal opportunities and rights. In the context of our school level, it’s for us to treat all learners equally. Give them that level of playing field for them to reach their potential. We have learners coming from different backgrounds. Some are from very poor homes, different tribes, academically weak, average, and low.”*

As part of the interviews, teachers were also asked how they implement GESI during lesson delivery. The findings revealed that most teachers cited group exercise as their main approach for ensuring they implement GESI in the classroom. They also followed up by saying they ask questions equally to both male and female students during their lessons. In an interesting twist, some of the lesson observers reported that in some instances, a few teachers were overly concentrated on the female students, ignoring the male students. For example, an observer reported that a teacher set up five groups as part of the activities and selected only females to lead the group. This was also confirmed in an interview with another teacher who said, *“The class that I handle, most of the time, the girls are even more than the boys, so I don’t have a problem with GESI. The group leaders are always ladies when I assign them to exercises and assignments. We are not relegating the guys to the background, but we want to make the ladies aware that they are also included. So whenever I give them group assignments or presentations, the leaders are always ladies. Then maybe the guys would be made assistants.”* This suggests that a section of teachers interpret GESI as a means to majorly uplift female students instead of focusing on equality of opportunities for both males and females. It is important to emphasize through PLC and In-service education and training (INSETs) to teachers that the concept of GESI focuses on improving not only female students' outcomes but all students equally.

Also, as stated above, some teachers organize remediation classes for students with SEN. They do this to ensure that the students catch up with the class due to their regular absence or learning disabilities. These teachers also confirmed that they do not charge the students for the extra tuition provided for them.

Interviews with teachers also revealed some challenges teachers face in implementing GESI during lesson delivery. A few teachers explained unconvincingly that sometimes female students come from weak educational backgrounds and require much more attention. They said due to their weakness, they are unable to pay particular attention to them during lesson delivery because they might drag the class backward. For example, a teacher said: *“The challenge that I experience is that most of the girls are from rural areas, and they are dull. They come because of free education so if you use a method that will focus on them, the class progress will be slow. So I use special methods to teach them so that they can also catch up.”* Another teacher shared his views by saying, *“They don’t have good literacy background. So when we bring them on board into the limelight, sometimes the task we give them is bigger than them and so they show unwillingness to take part. Some too are shy to stand in front of people to talk. So when it happens like that, we try to find a way of dealing with it.”*

3.9.8 Impact of PLC on teachers’ professional practice and students outcome

“I would like to say that the teachers shouldn’t stop the PLC sessions but rather intensify the PLCs because it is helping me take my lessons seriously.”

The above statement, and many more that will be presented in subsequent sections, is a testament to the impact the introduction of PLCs in schools has had on students’ performance. Similarly, many teachers have attested to their knowledge and skills improvements by participating in PLCs. PLCs provide teachers with opportunities to address lesson delivery challenges and collectively improve their teaching and learning practices. As the PLCs occur weekly within schools, they provide a cost-effective, structured, and sustainable means of ensuring that teachers improve their professional practice. Across the regions and schools, PLCs occur once a week regardless of whether schools are in session. Based on tracking dashboards developed by GES with support from T-TEL³⁵, the average attendance rate is 79 percent across the regions, with the minimum attendance rate being 72 percent. While these figures are encouraging, efforts must be made to encourage sustainable participation. While all teachers participate collectively, the PLC sessions are held departmentally in some schools.

³⁵ https://t-tel.shinyapps.io/secondary_reform/



Teachers participating in a PLC in Bassa Community Senior High



Teachers participating in a PLC in O.L.L. Girls Senior High



Teachers participating in a PLC in Taviefe Comm. Senior High

3.9.8.1 Impact of PLCs on teachers' professional practice

Acquisition of knowledge on innovative pedagogical strategies

Across the regions, teachers mentioned acquiring knowledge, skills, and techniques previously unknown to them or which they did not understand beforehand as a major achievement. The most dominant strategies teachers mentioned spontaneously were "differentiated technique," "group exercises," and "GESI." Some of the observers who participated in the PLCs during data collection also noted that the use of terminologies such as onion rings, pyramid discussions, triangular discussions, and GESI was very common among the teachers. According to a few observers, some teachers even gave their colleagues nicknames due to the techniques they use often. Based on the findings from section 3.9.5, several teachers also confirmed they had altered their assessment modes based on the NTS guidelines and information from online resources. As shared in section 3.9.7 of this report, the adoption of GESI strategies had considerably improved leading to the significant upward improvement of the indicator. Here are some quotes from teachers on how the PLCs have impacted their knowledge:

"One technique I learned from the PLC is 'torch shower' and 'fishbone'³⁶. I use the fishbone to teach problems, their causes, and their effects. Sometimes, I use the fishbone. When the students see the fishbone on the cardboard, that alone motivates them, and they become curious to know what I will use it for. Using that, I am able to catch their attention, and they really understood what I teach them compared with previous lessons."

- *"I teach mathematics. Male students feel like they dominate that subject. So, especially when you ask questions, you see the boys raising their hands and you are tempted to give attention to them to produce their answers. But since the PLC came into session, we have had an equal*

³⁶ These are teaching strategies that allow students to explore multiple causes that contribute to an outcome.

opportunity for all genders and ethnicities. So, though the girls might not raise their hands to answer questions, I give equal chances now to the girls. Even if they don't want to talk, I mention their names. So, when I call one girl, I make sure I call one boy, so I don't concentrate on the boys only."

Source of motivation to enhance teacher performance and retention

As stated in section 3.9.1, teachers highlighted some impacts the introduction of the PLC has had on their motivation as teachers. For many of these teachers, especially those intrinsically motivated, the boost in their confidence to deliver quality teaching and positive student feedback and energy has improved their willingness to remain in the teaching profession. For example, a teacher said, *".... based on what we have learned and implemented from the PLC sessions, I feel more motivated to do more in the classroom. In fact, when I teach, and the students respond, it makes me feel like I am doing something positive."* Another teacher providing a fuller explanation of the impact of PLC on his motivation stated:

- *Now, PLC and T-TEL are moving the whole teaching profession into a different paradigm shift. I am so happy and motivated now because I am seeing real practical changes in my teaching. Now, you need to consider a lot of sensitive things before you go to the class. You need to prepare in advance. You need to engage the student in every aspect of the teaching. In your teaching, you need to consider gender. You need to consider ICT. You need to consider 21st century skills. You need to consider the emotions of the learners when you go to their classrooms. You involve the students in the teaching and learning process, right from the introduction to the conclusion. Now, T-TEL has made us understand that. We should even engage the learners to know the objective of our learning process, the topic we want to teach. We need to let the learners know, clearly stated on the board, so that at the end of the lesson, when you are assessing the student, your assessment will be on your learning outcome. And your lesson delivery must be based on your learning indicators. And you realize that when you do that, the children or the learners will never be boring in the class. They will be part of every activity, from the introduction to the conclusion."*

Teacher support systems and collaboration

A key innovative strategy that has emerged from the introduction of PLCs is the nature of collaboration and support that has taken root among teachers. Across the regions, teachers mentioned "critical friend" as a new original introduction that has enabled them to receive and provide support to their fellow teachers. Teachers explained that, as part of the requirements of the PLC, every teacher is

required to have a critical friend; the main objective of the friendship is to observe each other's lessons and provide feedback to ensure adherence to the NTS guidelines. The collaboration also enables the teachers to be more comfortable discussing their challenges and suggestions and seek advice on more effective approaches to dealing with specific topics. Some teachers further stated that the collaboration had transcended the bounds of the PLC into a social support system where critical friends visit each other, attend weddings, and provide funeral support:

- "I would say that the critical friendship is more of a social assistance now. Sometimes, you hear teachers helping with content, but when I need some support, teachers will come together to support me. For example, if I have a funeral or a wedding. I also visit my critical friend informally and not just about PLCs."
- "At the PLC sessions, we are advised to pick a critical friend. Each teacher has a critical friend. So, during my lesson delivery, my critical friend normally sits at the back of the class to observe my teaching. After the class, the teacher gives me the positives and negatives, and I make room to improve on the negatives."
- "We have what we call critical friends. We observe each other's lessons. We get feedback to help polish areas we don't do well. The friend will pinpoint what he thinks you can incorporate to improve your lessons. For example, whoever observes your lessons will say, oh, you did very well. I enjoyed this aspect of your lesson. And I think we can attribute it to the PLC sessions and lessons we've learned there."

Improvement in leadership qualities

A key component of the PLC requires that someone be selected as a facilitator to oversee the session. In some schools, the roles of facilitators are rotated to enable all the teachers to participate actively in leading the sessions. The teachers confirmed that sometimes, the facilitators are required to educate the other teachers based on their areas of expertise. They confessed, this encourages them to revise their knowledge to better educate their colleagues. These, they said, improve their leadership skills and professional practice. Some teachers also said that as a school, they had agreed to assign a component of the NTS to teachers to read more on those areas and share their knowledge with teachers. For example, a teacher from Navrongo SHS said, *"PLC has reintroduced my confidence level as a teacher. Sometimes to stand in front of your colleagues and others to share your knowledge is not easy. It challenges you and brings out the best in you."*

Reduction in teacher truancy and indiscipline

One key benefit that has emerged from the LiT programme is the re-establishment of discipline among teachers through effective monitoring by school leaders, regional directors and members of the RMTs. Interviews with teachers revealed a significant change in the attitude of school leaders especially on teacher absenteeism. They explained that because of the PLC, heads of schools regularly visit the classes to ensure teachers are present. Also, teachers who absent themselves from the PLC sessions are asked to report to the heads to provide explanations for the absence and if permission was sought. As one teacher explained: *“Now, when you talk about the school leadership, the assistant-head academic usually does the lesson observations. And he does this every blessed morning. They come around the classes and take note of teachers who are not prompt in their classes, and they will call you on phone and ask why you are not in. For this school, when you are late even for a minute, you are called to order. So, you cannot absent yourself from class without the knowledge of administration.”*

Interviews with members of RMTs confirmed the efforts by school leaders and stakeholders to reduce teacher truancy. For example, an RMT member in the Oti region stated that teachers who regularly absent themselves from PLCs must report to the regional education directorate to be reprimanded. In some regions, special committees reprimand teachers who miss two consecutive PLC sessions. In others special PLC sessions are organized for teachers who regularly absent themselves from the PLCs to ensure they are up to date with their colleagues.

3.9.8.2 Students’ perspectives on the impact of PLC on their lessons

Students who participated in FGDs shared their experiences on how PLC sessions had impacted their studies. They explained this through the observed character changes of their teachers, the methodologies adopted by their teachers, and the use of digital technologies. It is interesting to note that all the students who participated in the FGDs were aware of the introduction of PLCs in their schools. This is because, according to some of the students, their teachers have explained to them the changes they would make to their lessons based on their participation in PLCs. For example, a student participant said, *“When my teacher came to class, he told us that the school has introduced something called PLC, which is a way to let teachers discuss ways to teach students well. And ever since then, he involves us more times, he gives us group work and asks us to do presentations.”*

As discussed in the last subsection, the LiT’s effort has led to a reduction in teacher absenteeism. Some of the students confirmed this. They explained that, sometimes, the school leaders visit their classrooms and record the names of absent teachers. For example, two students in an FGD said this about their teachers:

- *“There were some teachers who would miss their classes. I don’t know why, but they sometimes won’t come to class. And this was really bringing us down. But it got to a time when*

the administration authorities started coming around the classroom. So, when they come and the teacher who is supposed to be in class is not there, they simply write his name, go back, call the person, talk to the person, and advise the person on what to do. So I realize that after doing those things the teachers come to class; they don't miss again, and it's really helping."

- "At first, he didn't come to class. After the PLC, he comes to class every time because the school head is always going around checking."

Interestingly, some of the teachers reported noticing differences in the temperaments of their colleagues. They explained that, prior to the PLCs, some of the teachers neither joked with them nor engaged them. However, they had noticed after the introduction of the PLCs that their teachers had become more friendly and accommodating. Some also shared that their lessons had become more interesting, preventing them (students) from sleeping or dozing off during lessons. Quotes from some students are presented below:

- "...we have a science master. Every time he enters the class, he is so strict and tense that you're not free to do anything. So anytime it reaches his period, some people will run and go to the dispensary so they don't attend his class. Since the PLC came, I don't know what they did there, but the teacher now, if he comes to class, he always smiles and does things to make the class interesting, which has helped us. Now those who always run away stay and learn."
- "The PLC has changed the atmosphere, as most of us are saying here. Formerly, when you hear a particular lesson coming up and then you'll be like shii, I wish I wasn't in school. I would have taken exeat and gone to the hospital. But now I think it has changed a lot."
- "For instance, one notable thing is that when the PLC wasn't introduced, you would be in class and be sleeping, and your master would sack you from the class, but after the PLC was introduced and they got to know some brain yoga and ice breakers it has really improved. To the extent that when the master sees that the class one or two of you are trying to sleep, he will just crack a joke, and the whole class, will laugh, to just clear off the sleep."

Students further shared in the FGDs that the most evident impact of the PLC is their involvement in their teachers' lessons. They expressed that before the PLC, some teachers would come and only read the text to them, and then the class would be done. However, after the PLC was introduced, the teachers interacted more with students and engaged them in exercises:

- "During the time the PLC wasn't yet introduced, our interscience madame would come to class to read plenty of theories. And all the class would put our heads on our tables. But these days,

it's like she doesn't even teach. She makes us learn everything on our own and come and do presentations. She scores the marks and gives us tests and we all pass.”

- “...most of our teachers have developed this new strategy of teaching. They give us specific areas to go and learn and then come and present to the class, which has helped me to know myself. For me, I'm the one who teaches others the mistakes.”

According to a few students, integrating ICT into their lessons has helped them properly understand the teacher's teaching. A student describing how the integration of ICT had helped him understand a lesson said, “Yes, it has really helped us to understand complex topics. When we were learning genetics and biology, when they said I was just talking about DNA and the RNA, the double helix structure, we were like, oh my God, because we didn't understand it. But when he brought his laptop one day, and he showed us the video about it, we were like, oh, okay, so this is how it looks like. So, even if you don't remember what he said, at least what you've seen, you can use it to describe it and write something when it comes to examination. So, it has really helped us in our academics.”

Lastly, a few students indicated that adopting the group presentation approach by their teachers had helped them hone their leadership potential. A student said, “It has made me understand that I have to take up a leadership role; that is, when it comes to presentation, I have to make my colleagues understand and be able to write it.”

3.10 Secondary education institution findings

The focus of this subsection is on the leadership and management of SEIs. Leaders of the SEIs are assessed to ascertain whether they understand their roles and responsibilities and can demonstrate with evidence the execution of same.

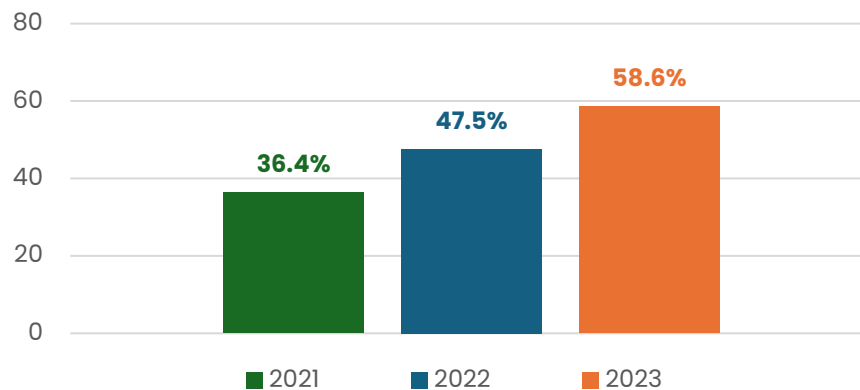
3.10.1 Boards and senior management teams of secondary education institutions that demonstrate understanding of their roles and responsibilities

The survey sought to determine whether senior management teams of secondary education institutions understand their roles and responsibilities and can prove how they execute them. Box 3.4 presents the criteria for measuring the leadership and management skills of school leaders in SEIs. Data presented in the Figure 3.7 shows that more than half of school leaders are demonstrating an understanding of their roles and responsibilities.³⁷ This signifies a significant improvement when compared with the 2022.

Box 3.4 Criteria for measuring roles and responsibilities

- Developing and implementing vision and mission statements
- Developing and implementing school improvement plans
- Developing strategies to support professional development and teaching practices
- Developing strategies to support improvements in students' achievement
- Establishing and capitalizing on linkages with industry and tertiary institutions.
- Setting up committees to address issues in the school

Figure 3.7 Proportion of school leaders demonstrating their roles and responsibilities



In addition to the criteria used to measure the roles and responsibilities of school leaders, interviews with school leaders shed light on what their responsibilities were. The qualitative results revealed that most school leaders were responsible for managing the academic and administrative sectors of the schools as well as ensuring the general well-being of staff and students. Thus, most school leaders

³⁷ In calculating for this indicator, information provided by the headmaster and his assistant are triangulated to generate mean scores based on a five point scale. Schools that obtain a minimum score of 50 percent are deemed to have satisfied the criteria for the indicator.

explained that they ensure that effective teaching and learning take place in the school, a responsibility which they execute through lesson observations and monitoring, clear allocation of staff responsibilities as well as provision of adequate teaching and learning resources.

Some school leaders added that they also were responsible for ensuring that the administrative sector of the school is well managed. For instance, a school head stated that *“..I ensure that there's effective teaching and learning in the school and ensure that all the structures in the school are functioning. I am not only managing human resources but also time, physical and material resources. As a head, it is my role to ensure improvement in every sector of the school.”*

Some school leaders pointed out that they were mainly responsible for safeguarding the well-being of students and staff. For example, a senior management member of a school in the Ashanti region indicated that *“my core mandate as the senior housemistress is to take care of the female teachers and, more importantly, the female students.”*

Another school leader in the Central region revealed that *“I am the senior housemaster of the school, so, I am directly responsible for the general well-being of all students, particularly the boarders on campus.”* Below are some quotes from school leaders on their roles and responsibilities:

- *“First of all, my role is to ensure discipline in the school, making sure that teachers attend class regularly. I do observation and supervision to ensure that teaching and learning is going on the way the teachers want it to be.”*
- *“Primarily, my role as a headmaster is to ensure the successful implementation of the free SHS policy in this school by ensuring that responsibilities are allocated to my staff and resources from GES and the ministry are properly allocated to them to ensure effective performance of their role as teachers. I also spearhead the maintenance of discipline for staff and students. You know, there can be no proper academic performance in an atmosphere that is void of discipline.”*
- *“As the leader of the school, I take care of the teaching and learning needs by ensuring that adequate resources are provided timely, and of course provide guidance to teachers and students to effectively teach and learn.”*
- *“...it is my responsibility to ensure that effective teaching is being carried out which is in line with the mission and vision of the school.”*
- *“Basically, my role is to perform administrative and managerial duties and ensure improvement in academic performance. I also ensure financial management and judicious use of school resources.”*
- *“I am the assistant head academic in charge of examinations, both internal and external. I also monitor teachers' output of work through lesson observations. I am the chairman for all*

head of departments, I chair functions anytime we meet. I also assist my head by attending all school gatherings, so that he will be able to effectively discharge his functions."

Table 3.43 displays results on the competency scores for boards and senior management. The results show a significant increase in the proportion of SEIs whose school improvement plan (SIP) includes teaching and learning targets between 2022 and 2023. The results also show that the proportion of SEIs whose SIP have student engagement and performance targets and GESI targets have increased between 2022 and 2023. Although the remaining competencies saw slight increases, the differences were not statistically significant.

Table 3.43 Competency scores for boards and senior management (%)

Competencies evaluated	Survey 2021	Survey 2022	Survey 2023
The school mission statement aligns with GES	89.7	100.0	100.0
The school vision statement aligns with GES guidelines	84.5	100.0	100.0
The school provides counselling services for students	56.7	73.0	75.8
The school has a SIP that has been shared and aligns with the vision	46.4	96.0	100.0
The SIP has student engagement and performance targets	33.0	42.0	60.0*
The SIP includes leadership and management-focused targets	30.9	54.0	61.3
The SIP includes GESI targets	29.9	45.0	60.0*
The SIP includes teaching and learning targets	25.8	39.6	67.4*
The school has strategies to support the professional development of teachers	18.6	36.0	100.0*
The school has strategies to support improvements in student performance	17.5	39.0	99.0*
Institutional Partnership/Community Engagement targets in your SIP or as a school	14.4	31.0	40.0

* $p \leq 0.05$

3.10.2 Secondary education institutions with an inclusive, gender-sensitive environment for staff and students

The survey sought to assess the extent to which SEIs provide an inclusive gender-sensitive environment for staff and students. In assessing this, responses from school leaders (including a review of documentation) were triangulated with data from teacher lesson observations and student self-assessment questionnaires to determine the level of inclusiveness of SEIs. Thus, schools must attain a minimum score of 65.0 percent in order to be considered as having an inclusive, gender-sensitive environment.

Figure 3.8 shows that almost half (49.0%) of SEIs surveyed are ensuring an inclusive, gender-sensitive environment for staff and students, as compared with 40.0 percent in 2022 and 36.2 percent in 2021. This suggests that SEIs are making steady progress in ensuring that their school environment is inclusive and gender sensitive.

This subsection disaggregates the result by the GESI criteria measured. Table 3.44 shows a significant improvement in the proportion of SEIs with dedicated spaces/admission for students from disadvantaged backgrounds, with an increase from 45.0 percent in 2022 to 62.2 percent in 2023. The table also shows that 7 of 10 SEIs have a transparent reporting system for harassment and recourse and reprimand for harassment for staff and students. While this is a good achievement for the head of schools, the results show no significant variation from the 2022 and 2021 values.

Box 3.5 Criteria for measuring inclusive, gender-sensitive environment

- Dedicated spaces/admission for students from disadvantaged backgrounds
- Transparent reporting system for harassment
- Recourse and reprimand for harassment
- Procedure in place to provide an inclusive and gender-sensitive environment for staff and students
- Health and safety procedures in place for staff and students
- Gender-responsive infrastructure like washrooms and changing rooms
- Infrastructure in the school accessible to all students (including those with special education needs i.e. SENs)

Table 3.44 Schools that satisfy inclusive, gender-sensitive environment criteria (%)

Head of school GESI criteria	Survey 2021	Survey 2022	Survey 2023
Gender-responsive infrastructure like washrooms and changing rooms, etc.	77.0	73.0	68.4
A transparent reporting system for harassment	76.0	72.0	72.5

Recourse and reprimand for harassment	72.0	72.0	70.4
Infrastructure in the school accessible to all students (including those with special education needs)	68.0	72.0	68.7
Dedicated spaces/admission for students from disadvantaged backgrounds	44.3	45.0	62.2*
Procedures in place to provide an inclusive and gender-sensitive environment for staff and students	44.3	56.0	64.3

*p≤0.05

The qualitative survey solicited insights into the kind of efforts that school leaders are making to ensure that secondary schools have an inclusive, gender-sensitive environment. Interviews revealed that some school leaders are ensuring that both male and female students and staff are not discriminated against but are given equal opportunities to vie for leadership positions. Some leaders also revealed that they ensure that facilities such as washrooms and changing rooms are gender-responsive. A case in point is when a school head in the Central region explained that the school has separate adequate changing rooms and bathrooms for boys and girls to enable them to freshen up after their involvement in sporting activities. During an in-depth interview, the school head explained, *“We don’t have a problem with ensuring a gender-sensitive environment in this school. We make sure that the girls’ toilet and the boys’ toilet are separated. We have a two-bed bathhouse for girls during sports because some of them have to shower during swimming lesson We have separate changing rooms for both male and female swimmers with different costumes to make them feel comfortable. We have teachers who are taking care of both genders when they go to the swimming pool. We have female trainers who take care of the female students and male trainers for the male students.”*

In addition to gender-responsiveness, some school leaders indicated that they are sensitive to promoting the inclusion of students with disabilities in learning activities as well as ensuring their general well-being. For instance, a senior management member of a school in the Oti region disclosed that *“GESI is one of the topics we handled during the PLC, so we try to give our students... some form of support so that they will have a level playing field. We have a way of handling our students, especially, females and persons with a disability. For example, we try to identify students with visual impairment and make them sit forward [in class], so that they will not struggle to see or there would not be any obstructions or distractions in their way when learning.”*

A few school leaders revealed that they are trying to improve their school’s infrastructure to enhance accessibility to students and staff. For instance, a board member in the Upper West region stated, *“We make sure that our school environment is friendly to both students and teachers. We have some persons with disability, and it was difficult for them to climb up to the president’s office. So, in our ongoing new construction, I try to let them understand that disability is not inability, so we have made provision for them to improve accessibility.”*

A key component of GESI is the prevention of sexual exploitation and harassment and the creation of safe spaces to ensure the grievances of students and teachers are addressed. The result in table 3.44 shows that over 70 percent of the sampled schools have a “transparent reporting system for harassment” and also “recourse and reprimand for harassment.” Most heads in the interviewed revealed that there had been no reports of sexual harassment in their schools within the 2022/2023 academic year. In minor cases, some schools reported incidences of reported cases. According to the schools that reported the cases, they abided by the GES code of conduct on sexual harassment recourse and sanctions to make decisions on perpetrators of harassment. Some of the complaints students reported include male seniors sexually harassing male juniors, teachers harassing students and students engaging in sexual misconduct. According to the heads, issues of harassment are referred to the school’s disciplinary committee to be investigated for recommended sanctions where applicable. In the case of teacher harassment, the case is escalated to the district and regional education directorate and police authorities for prosecution.

Heads of schools reported that in the 2022/2023 academic year, some teachers were counseled and warned for having affairs with female students in the schools. In two cases, teachers who raped female students were prosecuted, with one facing jail time while the other is still being investigated. In some cases also, the heads confirmed that the teachers were transferred from the schools to other schools. In the case of students, dismissals from boarding houses, stripping of prefectorial positions and suspensions were the main sanctions meted out. Some quotes from heads of schools are provided below:

- *“A teacher from my school is currently serving a jail term for rape. After the report of the rape was made, the school took appropriate steps to investigate and subsequently reported to the appropriate authorities, as a result of which the teacher was prosecuted.”*
- *“The school prefect was harassing other male juniors for sex and was dismissed. A teacher and a student were in a relationship and were counseled and then admonished.”*
- *“In the case of sexual harassment, which I mentioned, the culprits were suspended for some time to deter others from committing the same acts. ”*
- *“There have been sanctions to the extent that one of the prefects has been stripped of his position as the entertainment prefect.”*

The insights above prove that schools are making efforts to combat harassment to provide security for all students and teachers. However, some heads have complained continuously since the 2021 survey about some teachers who are transferred to other schools if they engage in sexual misconduct. They claim that such teachers are likely to repeat similar actions in the new schools they are transferred to.

In ensuring an inclusive, gender-sensitive environment for staff and students, The results show an appreciation of students’ knowledge of sexual harassment, reprimands, and reporting mechanisms

from 2022 to 2023. Based on interviews with students, about 46 percent indicated that they would like to report cases of harassment to the guidance and counseling office, followed by 24 percent who indicated that they would like to report to their housemasters or mistresses. About 11 percent of the students indicated that they would like to report directly to the heads of the schools given a chance. Based on the quantitative survey, about 60 percent of the students said they were satisfied with their school's response in dealing with cases of sexual harassment.

Here are some quotations from school leaders on what they are doing to ensure an inclusive, gender-sensitive environment for staff and students.:

- *"We are already practicing GESI, but since the introduction of the PLC, in which GESI is one of the core principles, we have intensified practicing it. Now, there is nothing that we do where we tend to neglect both genders, male or female. Since girls are perceived to be more vulnerable, we always try our best to help them. So, in the classroom, we try to involve both males and females when distributing questions and other tasks. [Also,] when it comes to leadership, like the composition of the student representative council we also take cognizance of GESI."*
- *"We always advocate for gender equality in the school by making sure that all the facilities that are provided are for both boys and girls. In terms of student-level leadership, it is open for all. We don't have [positions] for only boys and girls, no, it is open for all. So, a boy or girl could win the head prefect and it is accepted. So, we are very sensitive to that. For our staff, fortunately, we have more female teachers than male teachers. So, in the same way with staff, every gender is given an equal opportunity in terms of leadership positions and appointments... it is open to all."*
- *"We accommodate all students with diverse abilities. We have some friendly persons with disability, and we treat everyone equally. For instance, I have established a 'pick around' agenda so that people don't litter or drop anything on the ground. And there is a boy with some intellectual disability, and he has a peculiar attitude. Every morning, the boy will be come to school very early and will be picking around. So, it tells you that he has learned something and has the ability to learn more. They are all together in the class and they are treated equally."*
- *"We give all teachers and students the opportunity to thrive and give of their best. We don't discriminate gender-wise. We give both boys and girls equal opportunities."*

3.10.3 Secondary education institutions providing services for their students

The 2023 annual survey measured the percentage of SEIs providing services to their students (see box 3.6). The survey asked heads of SEIs whether their schools have full- or part-time counsellors that offer:

- Career guidance is provided to students to help them acquire the knowledge, information, skills, and experience necessary to identify career options and narrow them to make a career decision.
- Academic counselling, which helps students acquire and apply effective and efficient study skills with the intention of improving students' academic performance; and,
- Psychosocial and emotional counselling services support the process of overcoming environmental, emotional, or social concerns.

Box 3.6 Criteria for measuring SEI provision of services

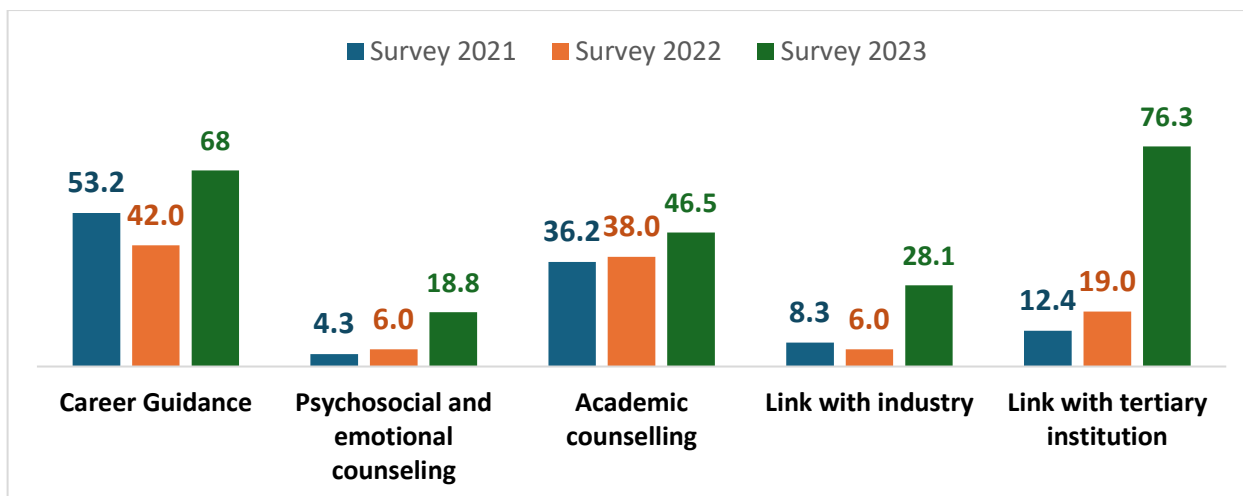
- SEIs providing career guidance, psychosocial and emotional support, and academic counselling to students
- SEIs with trained and dedicated officers to provide counselling support services to students
- SEIs provide evidence of links with industries
- SEIs to provide evidence of links with tertiary institutions

The results were triangulated with students³⁸. Follow-up interviews verified the availability of the services at the schools.

Figure 3.9 shows significant improvements in the proportion of SEIs providing students with a link with tertiary institutions from 2022 to 2023 and links with industry from 2022 to 2023. The figure also shows significant improvement in the proportion of SEIs providing psychosocial and emotional counselling services to students.

Figure 3.9 Percentage of SEIs providing services to their students

³⁸ Using a Likert scale, students were asked to rate the extent to which they agree or disagree with the following statements: (a) counselling services at my school are a priority in supporting my educational progress and my emotional well-being (b) the career guidance I have received at my school has helped me make a decision about what I should do with my life in terms of further education or the world of work.



The qualitative survey sought to throw more light on the services that SEIs provide. Students were asked to describe the forms of support services available in their schools. According to most students, they receive career guidance and academic counselling services. These services help students with their academic performance, mental health, social and emotional skills, and relationships. The results show that students are provided with guidance services together as a group, whereas counselling is usually offered privately.

For instance, a student stated that *“one thing the school is doing to help students in academic discipline is the school’s counselling team. During the sessions, since this is a mixed school, they give us pieces of paper to write down anonymous questions and grievances that frustrate us. Because of that, some of the things bothering us have now stopped so the counselling session is something that is really helping students to be stable and disciplined. Sometimes, we don’t have people to talk to, so the counselling really helps us.”*

Some students also revealed that they are provided with a sexual and gender-based violence response system and psychosocial support services:

- *“There is a support system for the school in the areas of counselling, career guidance, role modelling, etc. It is something that is very dear to the headmistress, so she tries her possible best to educate us. Through that, we find that students are more disciplined, and students are more time conscious about what they do.”*
- *“We have a guidance and counselling slot on our timetable. Usually, they allocate one hour in our timetable for the counsellor to come in and give us some advice. The counsellor tells us the do’s and don’ts of the school. If you are suffering from a particular problem, he will talk to you about how to go through the situation or how to resolve it. Sometimes we meet him in the office to discuss the problem that we are facing, and he will find a solution for us.”*
- *“We have academic counselling with our reverend father every Tuesday and Friday morning. Sometimes he meets us and advises us to learn hard and how we should behave on campus.”*

We also have a master who has been engaging us in sexual and gender-based violence response system. With the way he has been advising and guiding us on how to live our lives, we have not heard of sexual and gender-based violence.”

As indicated in figure 3.9, schools significantly improved their links with industry and tertiary institutions. Interviews with school heads outlined various benefits they gain from associating with key industries in their location. Contacts were made with some of the industries cited to verify information provided by the school heads. The benefits from these industries include cash donations, provision of infrastructure facilities, the provision of teaching and learning materials, internship opportunities and the provision of cleaning materials and detergents. For example, a school in the central region has collaborated with Peelco Fruit Limited. The company has adopted and refurbished the school's Home Economics department, including providing an ICT laboratory. Validation with a company representative confirmed this information. A school in the Eastern region also indicated that they had collaborated with local artisans to provide internship opportunities for their students in the visual arts department to gain practical experience. A few schools in the Western region also indicated that they receive infrastructural and resource support from Tallow Oil and the Ghana National Petroleum Commission (GNPC). A few heads also mentioned that Campaign for Female Education (CAMFED) has provided scholarships to female students.

Despite some SEIs recording success in their engagement with industry players, some of the heads also indicated that they had made several efforts by writing formal letters and through visitations but they had not received any feedback. Other heads also indicated that they had not tried to reach out to industries because there are none in their communities or vicinities. For example, a head from the Savannah region said, *“In my area, there are very few industries around to engage. These are privately owned and have no interest in relationships with schools that are not business-minded.”* Another head from the Ashanti region said that, *“We have tried, we have written letters to GNPC and Tobinco but they have not responded.”*

The result in figure 3.9 also shows a remarkable increase in the number of schools that have created links with tertiary institutions. This increment was recorded across the regions, especially in the middle and southern parts of Ghana. A key observation from the findings revealed that most of the school heads mentioned Kwame Nkrumah University of Science and Technology (KNUST) as the most common tertiary institution offering scholarships, training and counselling to high performing students. The school heads cited various types of support they receive from the tertiary institutions. Some of the responses from school heads are presented below:

- *“KNUST gives free admissions to our students with good performance. The university gives out free application forms to the school for interested candidates to apply every year.”*

- *“The universities run workshops, and also, their students come for internships. They also come for outreach programmes.”*
- *“The school has a relationship with some of the tertiary institutions such as the University of Energy and Natural Resources (UENR) and KNUST. They provide the school with some scholarship packages for our students, such as MasterCard Foundation. They normally organize seminars and training programmes for our students. ”*

“KNUST has a policy for less endowed students where the best six performing WASSCE candidates are offered admission without buying forms. University of Energy and Natural Resources and Sunyani Technical University also provide services such as career guidance, among others, to candidates every year.”

3.11 Stakeholders’ perspectives about secondary education in Ghana

This section delves into the perspectives of stakeholders regarding secondary education in Ghana. The stakeholders include parents, teachers, alumni, board members, policymakers, and opinion leaders, with each group offering unique insights shaped by their experiences and familiarity with secondary education in Ghana. Their perspectives center around the quality of secondary education, curriculum relevance, access to resources, and the impact of secondary education on national development. Recognising and understanding these varied viewpoints could be crucial for policymakers to make informed decisions and develop tailored initiatives to improve teaching and learning in secondary schools.

3.11.1 Perceptions about the quality of secondary education in Ghana

The 2023 annual survey sought to determine stakeholders’ perceptions about the quality of secondary education in Ghana. Results presented in Table 3.45 reveal an improvement in the proportion of stakeholders rating the quality as excellent or good. The results also show a significant decline in the proportion of stakeholders who rated the quality of secondary education as poor, from 7.4 percent in 2022 to 5.1 percent in 2023. Across the stakeholders, parents and board members rated the quality of secondary education as excellent. Significant improvement was also recorded in the proportion of teachers who rated the quality of secondary education as good and a significant decline who rated the quality as poor (see Table 3.45).

Table 3.45 Stakeholders’ rating of the quality of secondary education in Ghana (%)

	Parents		Opinion leaders		Alumni		Agencies/ Union/ Civil society org.		Board members		Teachers		Overall	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Excellent	1.3	10.6*	4.1	6.6	5.9	9.6	9.5	3.6	1.6	8.1*	2.1	2.9	4.1	6.9*
Good	61.2	65.0	63.2	65.6	56.7	63.9	52.4	50.0	49.7	57.5	30.1	36.2*	52.2	56.4*
Fair	30.8	17.5*	24.3	21.3	28.7	18.7*	30.2	42.9	43.8	30.1*	46.7	43.8	34.1	29.0*
Poor	5.9	5.5	7.9	2.5*	5.9	6.4	4.8	0.0	4.3	3.8	15.7	12.4*	7.4	5.1*
Very Poor	0.8	1.4	0.6	4.1*	2.9	1.4	3.2	3.6	0.5	0.5	5.4	4.7	2.2	2.6
N	374	217	342	122	171	219	63	28	185	186	1,474	1,490	2,609	2,262

*p<0.05

Note: Percentages may not sum to 100 due to rounding.

3.11.2 What stakeholders like or dislike about secondary education in Ghana

The qualitative survey shed light on the aspects of secondary education that stakeholders like or dislike. One of the most prominent things stakeholders like is the free secondary education policy. Stakeholders appreciate the fund its role in facilitating access to education to students with financial constraints. Stakeholders also commended the secondary education system for its role in preparing students for higher education and future careers. They explained that Ghana's secondary education provides opportunities that pave the way for students to further their education or enter the world of work. For instance, an alumna from North East Region stated that, *"...secondary education serves as a stepping stone towards higher learning, particularly tertiary education. I appreciate its role in equipping us with the necessary knowledge and skills to face the challenges of the next academic level."*

Another alumna from Ashanti Region stated that, *"I like the vocational institutions as well as the general arts courses [provided] in secondary schools because students can further their education by going to nursing school..."*

Some stakeholders highlighted the positive impact of secondary schools' boarding system by indicating that it fosters unity among students from diverse backgrounds. A case in point is when an alumna from the Upper East Region stated that, *"The boarding system was beneficial in several ways. Not only did it provide us with accommodation but also fostered independence and maturity in us. Being away from our homes allowed us to learn how to manage our affairs and adapt to new situations, contributing to our personal growth and development at an accelerated pace."* Other stakeholders emphasised the importance of secondary education by helping instil discipline,

character development and shaping students' behaviour to become prominent members of the society in future. This perception was echoed by a few stakeholders who emphasized how secondary education prepares students and instils important values for their future endeavours. Particularly, an opinion leader narrated how secondary education shaped the life of a youth who used to be notorious in the community. He concluded by pronouncing that, *"I like secondary education for the fact it helps to change human behaviour for the better."*

Another parent expressed this opinion: *"For me, what I like about secondary education is that it really helps because of how it has trained a lot of great people in our society."* Overall, stakeholders appreciate various aspects of secondary education, ranging from access to educational opportunities, character development to policy initiatives aimed at improving teaching and learning experiences:

The qualitative responses from stakeholders also revealed some dislikes about secondary education. One recurring issue stakeholders mentioned is the inconsistency in the quality of facilities and infrastructure in some secondary schools. For instance, some parents expressed dissatisfaction with the state of modern facilities, noting that some are not up to standard, and thereby could negatively impact the teaching and learning environment. Similarly, some alumni raised concerns about the quality of infrastructure in schools and voiced the need for infrastructural improvements to enhance educational outcomes and experience.

A few stakeholders expressed their displeasure with the double-track system. It was introduced in 2018/19 to accommodate the growing number of students, as existing facilities were not enough. Although about 60 percent of SHSs have been taken off the double-track system, the remaining 40 percent still use the system³⁹. Some alumni from the Northern and Upper West regions criticized the implementation of the double-track system, indicating that the extensive breaks between tracks tend to cause students to forget what they have previously learned. Some alumni and opinion leaders also opined dissatisfaction with the ban on the use of corporal punishment in secondary schools. They explained that due to the discouragement of using cane to correct wrong behaviour, indiscipline appears to be growing among some students. For instance, an alumna from the Ahafo region, lamented the limitations imposed on disciplinary actions due to the government's directive against corporal punishment, stating, *"I've noticed how students respond to disciplinary measures. While the government advises against using the cane on students, some of them only behave properly when they are given this form of discipline."*

Table 3.46 shows the percentage of stakeholders who rated the infrastructure of secondary schools they are familiar with and have visited, or their children attend as excellent or good. The table shows

³⁹ Speech of Minister of Education, Dr. Yaw Osei Adutwum, at the launch of the STEMNOVATION competition in Accra in May 2024.

a mixed observation over the past two years. Thus, while significant improvements were recorded in how stakeholders rated schools' infrastructure as gender-friendly and well-maintained, the rating on infrastructure availability declined. Across the type of stakeholder, parents, opinion leaders, and alumni reported improvements in well-maintained and gender friendly SEIs as compared with the other stakeholder groups. Also, only alumni recorded significant improvement in rating schools' infrastructure to be disability friendly. Also, only alumni recorded a significant decline in the area of infrastructure availability.

Table 3.46 Stakeholders who rated the infrastructure of the secondary school they are familiar with and have visited or their children attend as excellent or good (%)

	Parents		Opinion leaders		Alumni		Agencies & dev. partners		Board members		Overall	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Quality	48.7	41.0*	43.0	53.3	53.2	50.2	44.4	42.9	43.2	36.0	46.5	44.7
Availability	43.9	44.7	39.8	32.0	52.6	39.7*	47.6	50.0	33.0	26.9	43.4	38.7*
Usage	51.9	58.1	50.6	59.0	57.3	62.6	54.0	46.4	63.2	51.6*	55.4	55.5
Well-maintained	17.7	26.7*	14.9	23.0*	15.2	28.3*	22.2	25.0	24.9	29.0	19.0	26.4*
Disability friendly	16.6	23.0	17.3	18.9	17.0	25.1*	31.8	17.9	18.4	24.7	20.2	21.9
Gender friendly	49.2	60.8*	52.9	68.9*	50.9	71.2*	60.3	57.1	66.0	58.6	55.9	63.3*
N	374	217	342	122	171	219	63	28	185	186	2,609	772

*p<0.05

NOTE: The data in this table are multiple-choice. The totals sum to more than 100 percent.

Table 3.47 shows the ratings of secondary school infrastructure by teachers and students in 2022 and 2023. The table shows significant improvements in the proportion of students rating schools' infrastructure as quality, usable, well-maintained, and disability friendly.

Table 3.47 Rating of the infrastructure of secondary schools by teachers and students (%)

	Teachers		Students	
	2022	2023	2022	2023
Quality	25.8	23.1	32.2	35.3*
Availability	25.8	23.3	30.3	32.0
Usage	37.2	36.2	31.5	35.1*

Well-maintained	9.1	10.0	30.9	34.5*
Disability friendly	10.5	12.5	29.8	32.8*
Gender friendly	43.2	42.8	38.8	40.3
N	1,474	1,490	2,356	2,406

*p<0.05

Irrespective of the results showing significant improvement in students' rating of infrastructure, the qualitative survey revealed that a majority of students are not satisfied with the infrastructure and resources of secondary schools. Qualitative insight revealed that students are concerned with issues such as overcrowding due to insufficient classrooms, poor washroom facilities as well as inadequate furniture. Direct quotes such as *"we lack classrooms"* and *"the classrooms are crowded"* highlight some students' perspectives on their schools' infrastructural challenges.

Additionally, some students emphasised the need for gender-friendly facilities, with concerns raised about the small nature of dormitories and the lack of privacy. For instance, a female student in the Upper East region mentioned that *"the girls' dormitories are so small that we are packed in there like fishes,"* showcasing some students' dissatisfaction with existing infrastructure conditions. Here are some students' comments on the situations they encounter:

- *"We lack classrooms. For example, currently, the Form 1 home science students are using the old dining hall as a classroom. The class has been divided, and they share the space. When a teacher teaches in this class, the noise from the neighbouring class, which is partitioned only by plywood, cause distractions. It is the same for the form one science students who are now occupying the parent-teacher association (PTA) block, and it is divided into two classes with plywood and the noise interferes and disrupts teaching."*
- *"Our ICT lab is severely lacking, with less than 15 computers for a student population exceeding a thousand."*
- *"We don't have a classroom for French, so, we go to the science lab to check if there's any vacant room. We go round from the chemistry lab to the biology lab and the physics lab. If all the lab rooms are occupied, we sometimes sit under a tree to learn verbally because there is no writing board."*
- *"The current library and ICT labs lack adequate resources."*
- *"The physics lab is too small, and the apparatus is not enough. Even the batteries we use [for practicals] are not enough. Our number is too many, and the batteries are relatively small."*
- *"While we do have a library, it's insufficient for our needs. Similarly, the ICT lab lacks the necessary number of computers."*

Qualitative insights from teachers revealed a few challenges over the infrastructure of secondary schools. Some of these challenges include lack of good sanitation facilities, inadequate educational resources, lack of adequate classroom blocks leading to overcrowding, and poor ICT to support effective teaching and learning. Here are some quotes from teacher interviews:

"We often face challenges in maintaining a conducive learning environment due to insufficient classroom space and overcrowding."

"The classrooms lack adequate infrastructure to support ICT integration, hindering effective teaching and learning."

"Although the government has provided internet connectivity to every secondary school, including mine, the connectivity is currently unavailable."

"There's a shortage of teaching and learning materials. Sometimes, despite searching everywhere, there's nothing available."

"Limited access to updated textbooks and resources impedes the delivery of quality education."

3.11.3 Stakeholders' perceptions of the secondary education syllabus

Stakeholders' perceptions play a crucial role in shaping the relevance of the secondary education syllabus. The 2023 survey asked stakeholders to rate the quality of the secondary education syllabus as excellent, good, fair, poor or very poor. It is important to note that a majority of stakeholders engaged are not experts in curriculum development. However, their opinions may disclose some of the strengths and weaknesses of the secondary education syllabus.

Another alumnus who rated the syllabus as good stated that: *"I commend the curriculum for integrating ICT in teaching and learning to help students attain academic excellence. Leveraging on technology will enhance students' learning experiences and foster skill development."*

Other stakeholders rated the syllabus as good and emphasised its relevance in preparing students for the world of work through effective teaching methods, and promoting fairness, gender equality and social inclusion. Here are some relevant statements from stakeholders:

- *"I perceive the curriculum as 'good,' particularly in its ability to facilitate understanding through effective teaching methods, contributing to enhanced comprehension."*
- *"The curriculum is regarded as good because it embodies the country's aspirations adequately, aligning with national goals and objectives."*
- *"The curriculum receives high praise from me because it effectively covers topics beyond the standard syllabus, enriching students' educational experiences."*

- *"I view the curriculum positively, as it facilitates community access to education, thereby promoting societal development."*
- *"I find the curriculum 'fair,' because of its inclusion of ICT and related components. However, there's more room for improvement."*
- *"I rate the syllabus fair because of the curriculum's contribution to promote gender balance and inclusion."*

Likewise, some stakeholders expressed various likes about the current secondary school syllabus. They appreciate its ability to expose students to real-world scenarios and life skills, preparing them for future challenges. The integration of vocational education and the use of technology were particularly praised for enhancing learning outcomes and providing practical skills for students. Additionally, some stakeholders commended subjects like mathematics, government, and history for their importance in providing a well-rounded education.

- *"I appreciate the significance of core mathematics, recognizing its ubiquitous application across various fields."*
- *"The incorporation of vocational education into the system is commendable, enhancing students' exposure to practical skills and career pathways."*
- *"I find the current syllabus to be excellent, particularly for its emphasis on real-world applications beyond traditional textbooks, equipping students with essential life skills for post-school endeavours."*
- *"The curriculum simplifies learning, making concepts easier to grasp and understand, thereby facilitating students' comprehension."*
- *"The inclusion of vocational and technical courses, alongside the integration of technology in schools, is a positive development that broadens students' educational horizons."*
- *"I have a favourable view of the business management subject, because it prepares students for their future careers."*

On the other hand, some stakeholders identified a few dislikes about the secondary school syllabus. One common criticism is the perception of the syllabus being too overloaded, leading to rushed teaching and incomplete coverage of topics. Some stakeholders expressed dissatisfaction with the grading system, admission criteria, and poor alignment between topics. Additionally, there were concerns about the lack of teacher involvement in syllabus development. Here are some qualitative insights from stakeholders:

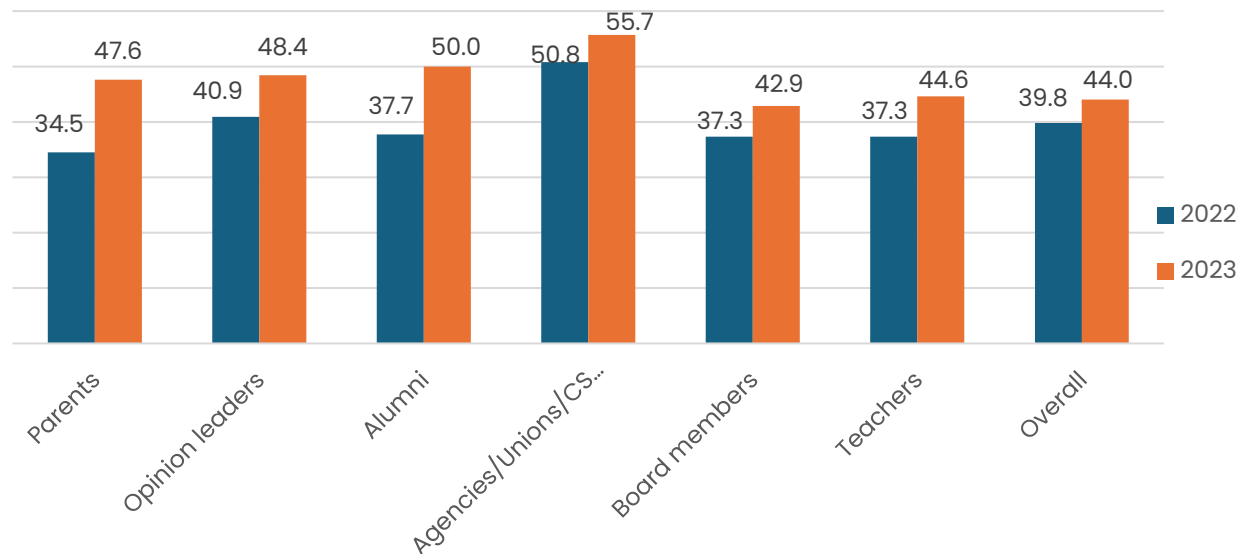
- *"The syllabus is overly burdensome, presenting challenges for both students and teachers."*
- *"The sheer volume of contents in the syllabus overwhelms some students, hindering their learning experience."*

- *"The educational system feels too rigid and coercive... it lacks flexibility for individual learning styles".*
- *"I'm concerned about the syllabus's attempt to alter historical narratives, which undermines the integrity of education."*
- *"The educational approach prioritizes teacher-centeredness over student-centred learning, thereby hindering effective engagement."*

Stakeholders' perception on whether secondary schools are preparing graduates for further studies and world of work.

The MoE along with its partners has initiated a new secondary education curriculum aimed at fostering graduates with 21st century skills. This curriculum seeks to cultivate innovation and creativity in students, preparing them effectively for higher education and the workforce. The 2023 annual survey sought to assess stakeholders' perceptions of the current secondary school system's ability to prepare graduates for future studies and employment. The data presented in Figure 3.10 reveals stakeholders' perceptions on whether secondary schools adequately prepare graduates for further studies and the world of work.

Figure 3.10 Percentage of stakeholders who perceive that secondary schools are preparing graduates for further studies and world of work.



3.11.4 Stakeholders' recommendations on changes to secondary school syllabus that will ensure graduates are prepared for further studies and the world of work.

Stakeholders⁴⁰ provided their suggestions on the changes that should be made to the secondary education syllabus to ensure that graduates with subject knowledge and critical and analytical skills are being prepared for further studies and the world of work. It is important to note that even though the views of the stakeholders do not necessarily reflect expertise in the education sector, the survey finds some of the suggestions interesting and insightful.

Some stakeholders emphasize the need to reduce the content of the syllabus, citing concerns about overload and the challenge of retaining information. For instance, an alumnus from the Bono Region opined that *"there is a pressing need for a reduction in the syllabus workload. The current syllabus overwhelms students with an excessive amount of content, leading to challenges in retention and understanding. By streamlining the syllabus, we can alleviate this burden and create a more manageable learning environment for students."*

Another alumnus from the Ashanti region suggested that the number of elective subjects should be reduced from four to two. He expounded that *"my suggestion would be to limit students to choosing only two additional subjects alongside the four core subjects. This would alleviate the academic burden on students, allowing them to focus more effectively on their chosen areas of interest."*

Other stakeholders suggested that the syllabus should include more technical skills and practical learning skills to enable graduates to have problem-solving skills and independence in the world of work. Below are some quotations from stakeholders on their recommendations that will ensure that graduates are prepared for further studies and the world of work:

- *"The inclusion of more project work assignments would encourage students to engage in practical, hands-on learning experiences." - Parent, Ashanti region.*
- *"When setting examination questions, they should directly align with the syllabus content taught to students, ensuring fairness and relevance." - Alumnus, Savannah region*
- *"The education system must prioritize digital literacy, particularly in areas such as ICT, to adequately prepare students for the modern workforce." - Alumnus, Ashanti region*
- *"The focus should be on helping students acquire practical skills and knowledge that are applicable in real-world scenarios during their secondary education." - Board member, Eastern region*
- *"Focus should be placed on helping students acquire practical skills and knowledge that are applicable in real-world scenarios during their secondary education." - Board member, Eastern region*
- *"There is a need for a more practical approach to the syllabus, with a greater emphasis on hands-on learning rather than theoretical concepts." - Parent, Western region*

⁴⁰ Please note that these are opinions of stakeholders who do not necessarily have comprehensive knowledge of education in Ghana.

- *"The syllabus should place emphasis producing graduates who are independent rather than dependent. Our educational system should develop students with problem-solving abilities to help them in the real world when they graduate." – Opinion Leader, Northern region*
- *"Improvements are needed in the technical courses to equip students with practical skills that are relevant to the workforce." – Parent, Northern region*

3.11.5 Stakeholders' ranking of their level of respect and perceived compensation for teachers and other professions.

The 2023 annual survey sought to determine the social standing of the teaching profession by asking stakeholders to rank their level of respect for 14 professions.⁴¹ On a scale of 1 to 14, stakeholders were asked to rank their respect for the 14 professions, with a score 1 being the most respected profession and 14 being the least respected profession. The opinion of stakeholders on how they respect other professions as against teachers is a key aspect of the annual survey because it suggests whether there is a link between the status of teachers in society and the performance of students in school. Based on the ranking by stakeholders, doctors were ranked as the most respected profession, followed by lawyers, engineers and accountants. Interestingly, secondary school teachers were ranked 10th and 11th, respectively. The rankings are similar to 2022 findings.

Table 3.48 presents stakeholders' attitudes toward encouraging their children or guardians to pursue a career in teaching. The table shows a significant increase in the percentage of stakeholders indicating they would definitely encourage their children or guardians to become teachers, from 15.2 percent in 2022 to 22.8 percent in 2023. However, there is a significant decrease in the proportion of stakeholders who would maybe encourage their children or guardians to become teachers. Except for alumni, the results show significant improvement in the percentage of all stakeholders who stated that they would definitely encourage their children or guardians to become teachers.

Table 3.48 Stakeholders who would encourage their children or guardians to become teachers (%)

	Parents		Opinion leaders		Alumni		Agencies/Universities/CSOs		Board members		Overall	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Definitely encourage	9.1	20.3*	10.8	27.1*	23.4	15.5*	19.1	28.6	13.5	22.6*	15.2	22.8*
Probably encourage	18.5	26.3*	17.0	23.8	20.5	20.6	23.8	17.9	27.0	27.4	21.4	23.2
Maybe encourage	28.9	22.1*	39.8	20.5*	27.5	34.7	30.2	25.0	30.8	21.5*	31.4	24.8*

⁴¹ The 14 professions are doctor, lawyer, engineer, accountant, management consultant, local government manager, nurse, headteacher, web designer, police officer, secondary school teacher, primary school teacher, librarian, and social worker.

	Parents		Opinion leaders		Alumni		Agencies/Unions/CSOs		Board members		Overall	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Probably not encourage	20.9	16.1	15.2	14.8	11.1	16.0	14.3	17.9	16.2	13.4	15.5	15.6
Definitely not encourage	22.7	15.2*	17.3	13.9	17.5	13.2	12.7	10.7	12.4	15.1	16.5	13.6
N	374	217	342	122	171	219	63	28	185	186	1,135	772

*p<0.05

NOTE: Percentages may not add up to 100 percent due to rounding

Table 3.49 shows the proportion of stakeholders who agree with specific statements about secondary school teachers for 2022 and 2023. The results show significant increments in the proportion of stakeholders who agree to statements such as effective teacher requires rigorous training, the quality of teachers is too variable, teachers should be rewarded in pay according to their learners' results, and teachers should be rewarded in pay for the effort they put into their jobs.

However, there is a significant decline in the proportion of stakeholders who perceive that it is too easy to become a teacher, from 22.4 percent in 2022 to 18.1 percent in 2023.

Table 3.49 Stakeholders who agree with statements about teachers (%)

	Parents		Opinion leaders		Alumni		Agencies/Unions/CSOs		Board members		Overall	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Being an effective teacher requires rigorous training	86.9	90.3	83.6	87.7	86.0	89.5	81.0	85.7	95.7	94.6	86.6	89.6*
It is too easy to become a teacher	23.5	22.6	19.9	18.9	20.5	20.1	28.6	10.7	19.5	18.3	22.4	18.1*
The quality of teachers is too variable	46.5	62.2*	55.9	60.7	49.1	63.5*	49.2	75.0*	58.4	57.0	51.8	63.7*
People respect teachers in Ghana	33.2	33.2	33.0	42.6	36.8	32.4	41.3	32.1	34.1	37.6	35.7	35.6
The teachers in my children's school are respected by their learners	73.0	76.5	74.9	77.9	79.5	79.9	81.0	78.6	82.2	80.7	78.1	78.7
Teachers work hard	90.6	85.3*	91.5	88.5	86.0	92.2*	85.7	78.6	84.3	89.8	87.6	86.9
Teachers should be rewarded in pay according to their learners' results	36.4	42.4	36.6	44.3	39.2	41.1	33.3	46.4	38.4	35.0	36.8	41.8*

	Parents		Opinion leaders		Alumni		Agencies/Unions/CSOs		Board members		Overall	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Teachers should be rewarded in pay for the effort they put into their jobs	81.0	85.7	81.0	87.7	77.2	89.5*	73.0	82.1	87.0	81.2	79.8	85.2*
Teachers enjoy a positive media image.	31.6	39.6*	34.2	38.5	41.5	37.0	46.0	21.4*	26.5	31.2	36.0	33.6
Teachers have long holidays	34.8	31.3	36.0	29.5	37.4	28.8	25.4	28.6	21.6	19.4	31.0	27.5
Teachers have the autonomy to exercise their professional judgement	40.9	42.9	47.4	46.7	45.0	46.6	46.0	39.3	34.1	35.5	42.7	42.2
Teachers are paid less than they deserve	87.4	83.4	86.6	83.6	87.1	88.1	88.9	82.1	87.0	88.7	87.4	85.2
Teachers' reward is in heaven	15.0	17.5	18.1	18.0	12.9	23.3*	19.1	14.3	16.8	13.4	16.4	17.3
N	374	217	342	122	171	219	63	28	185	186	1,135	772

*p<0.05

3.12 Changes in policies and shift in practices in government agencies as a result of T-TEL's support

This section documents shifts in policies and changes in practices in government agencies as a result of T-TEL's support

3.12.1 Findings from Ghana Tertiary Education Commission (GTEC)

The coming together of the National Council for Tertiary Education (NTCE) and the National Accreditation Board (NAB) birthed the Ghana Tertiary Education Commission (GTEC) following the appointment and inauguration of its governing board on November 25, 2020. This was made possible after the presidential assent was given in August of the same year under the new Education Regulatory Bodies Act, 2020 (Act 1023) for the formation of the commission. The objectives of the commission include the promotion of an efficient and effective administration and accreditation of tertiary institutions, the promotion of principles on the provision of consistent quality of service, the promotion of advancement and application of knowledge through teaching, scholarly research, and collaboration with industry and public sector as well as the promotion of the development of appropriate human capital for the sustainable advancement of the national economy. The

commission is expected to perform advisory, coordinating, regulatory, accreditation, and any other role necessary for the realization of the commission's objectives.

Findings from the representative of GTEC revealed that although the commission's work mainly surrounds tertiary education, it still shows a keen interest in the happenings at the basic and secondary cycle institutions as the products of these institutions end up in the tertiary education sector. Therefore, the commission has collaborated with other state and non-state agencies to implement several activities, including:

- Collaborating with the National Teachers Council (NTC) to establish the inter-agency teacher curriculum working group
- Collaborating with other stakeholders to assess the fidelity of implementation of the NTS, the national teacher education assessment policy, and the national teacher education curriculum framework.
- Collaborating with the National Council for Curriculum and Assessment (NaCCA) to produce a secondary education assessment guide.
- Engagement with tertiary education institutions and colleges of education to develop the SHS curriculum and
- Supporting the expansion of the National Implementation Support Team (NIST) to include representatives from the Conference of Heads of Assisted Secondary Schools (CHASS) and NaCCA

Concerning the inter-agency teacher curriculum working group, which the commission worked on in collaboration with the NTC, the representative explained that the rationale behind putting together the group was to revise the NTS, the national teacher education assessment policy, and the national teacher education curriculum framework to be comprehensive enough for the easy application of the universities. The revision is believed to enable the universities to train teachers with the requisite capacity and develop the skills needed to facilitate teaching and learning at the senior high and senior high technical institutions, as indicated in the representative's statement, *"The idea is to make sure that the document is comprehensive enough, if we're able to do the review, comprehensive enough so that universities can train SHS and SHTS graduates, teachers, to develop some kind of skills so they can get a bit of a hold on some of these things."*

The representative explained that the rationale that led to the collaboration and expansion of the team composition on the existing initiatives and policies was to ensure efforts towards attaining a transformed education sector from teacher-focused to learner-centered is achieved through the creation of a good and robust educational system that stands the test of time. Also, with these collaborations, challenges regarding different institutions having different opinions after an initiative has been undertaken will be a thing of the past as all these parties will be involved from the very onset of these review processes. This will further ensure the basics students need before entry to the tertiary will be provided to ensure tertiary institutions can produce graduates who meet international standards and allow them to secure jobs or further pursuit in this 21st century without needing any assessment.

"Well, in my view, I think it's a simple thing. The idea is that you want a transformed, generally you want a transformed educational system that's not going to be teacher-focused, but learner-centered. The idea is that whatever the whole thing is, we want to see a very good, robust educational system that's going to stand the test of time. Also, with this 21st century, GTEC as a commission is looking for the state where we are also up there and will be comparable and competitive with the outside world."

Concerning how these activities were carried out, the representative mentioned that the commission encouraged these institutions to be interested in providing input to review the existing initiatives. For instance, with the tertiary institutions, the representative stated that *"we urged the universities and the technical universities as well as the colleges of education to be interested in providing some input to this entire curriculum, the SHS curriculum that was also being developed. ... At the last meeting we agreed that because of LiT and the nature of secondary education thing and our affiliation with it, it's important to include members of the CHASS as well NaCCA so that they are also part of this decision making and everything that we do."* In respect to challenges faced, financial constraints and unavailability of logistics has been the major one as described by the representative that *"the challenges that we usually get come from financial and logistics"* which the representative talked about how T-TEL has been very instrumental in addressing. However, his concern with the commission has been the need for timely introduction, requesting support, and executing activities on time. Here is his response, *"I think for me, so far, so good. As a commission and institution, I think we should be coming up with our activities in time. We should bring it out in time, what we want to do, how we want to do it, and then seek support from T-TEL. If we can't do it on our own, we seek the support in time."* Also, due to the demanding nature of their work, staff seemed preoccupied, affecting their commitment level to all engagements.

In talking about the impact, the representative mentioned the impact of its activities, such as the fidelity of implementation (FOI) on initiatives such as introducing every teacher to hold a degree, has been felt at every level of the state governance. Specifically, through the support of T-TEL, the

government has streamlined most of its activities and made them a requirement. Additionally, teacher education has significantly improved, resulting in confidence among teachers and students. Here is a verbatim quote from the representative, *"We sit back, and we see an improvement in the teacher education sector and the caliber of people going in and being churned out of our institutions. You can tell that difference there."* In addition to the above, the collective inputs of all stakeholders, both from the national and grassroots levels, have created a massive impact as they have been exposed to how things ought to be done. It has allowed for the replication of these experiences at their level, as quoted by the representative, *"When we were developing the curriculum, for instance, on everything, you get teachers and writers from all those remote areas, everywhere around the country. So naturally, they go back, and we expect them to replicate what they have developed."* Also, at the school level, issues of mentors leaving classrooms once mentees are around have become a thing of the past as mentors now understand their roles in guiding the mentees. Here is a quote from the representative ... *"previously when the student-teachers even come around, the mentors will be like, oh since we have student-teachers, let me go to town for something quick, but after we made them understand their roles through leadership and counseling there has been a change".*

In describing the working experience with T-TEL, the representative describes T-TEL as the backbone of the commission. According to the representative, *"T-TEL is making us conduct our activities faster and swifter without a lot of bottlenecks. Because yes, GTEC is a government-supported body, but sometimes the funding doesn't come quickly, or it doesn't come at all."* To add on, T-TEL support according to the representative, is seen with all other agencies under the Ministry of Education (MoE) as well as the ministry itself. In addition, he mentioned that when it comes to the education sector in Ghana, T-TEL is a household name. Its impact, which started with the tertiary level, has also risen to the basic and secondary cycle institutions. Here is how the representative describes T-TEL... *"T-TEL has been our backbone, and they have been our backbone for all these years.... T-TEL supports practically everybody within the space now. I mean, T-TEL is a household name now when it comes to education in Ghana. And previously it was at the tertiary level. Now it's more with the pre-tertiary level."* The representative of the commission expressed that they would always want to work with T-TEL anytime because *"things are just going to be as planned and things are going to go on smoothly."* Concerning the area T-TEL will have to work, the representative requested for T-TEL to engage institutions from the planning stage of an intended activity to make such agencies feel they are part of the team and not only there to support activities undertaken by T-TEL. This, they believe will ensure the sustainability of such interventions. Here is a quote from the representative, *"if they also have an idea, they have a plan for their sector or their organization, they should get us involved right from the beginning. So, we plan together, we take the activities together, and we get to own it because sometimes it appears as if although we work together, we are sort of doing it on your behalf rather than you being a part of it."*

3.12.2 Findings from National Schools Inspectorate Authority (NaSIA)

NaSIA is an agency of the MoE established under the 2008 Education Act, 778. The agency was established to perform four main functions. Namely, to regulate the establishment of pre-tertiary educational institutions (PTEIs) by ensuring the suitability of infrastructure and facilities; provide licenses for new and existing PTEIs; support quality school leadership and governance to maintain the highest educational standards and implement monitoring and evaluation measures in the educational sector to uphold set standards and uncover challenges.

Based on information from a KII with a representative from NaSIA, the authority has implemented two policies and two key initiatives. One of the initiatives is new; the other had already begun in 2019 but recently benefited from a review with support from T-TEL. These policies and initiatives include: the School Establishment and Inspection Policy (SEaIP), School Licensing Policy (SLiP), Inspection Evaluation Framework, and the School Licensing and Inspection Management (SLIM) – a digitalization initiative.

According to the representative, the Inspection Evaluation Framework was already developed in 2019 but was reviewed with the rationale of staying relevant and up-to-date with the changing trends in educational standards to achieve the authority's main objective of inspection in the education landscape. The need to review the Inspection Evaluation Framework arose in 2023 and was supported by T-TEL. In the words of the representative, "...in 2019, the first framework was developed. And then, because of the current trend of education standards and the changes, the agency has a policy that every three years, because of the current changes, we also have to realign with the current changes. So, it started around 2023. And then, the process to review the entire document and the standards within there was done. Then, I think when it got to the review point, that was when T-TEL came in to help with the review of that..."

The SEaIP and SLiP have existed since 2021 and were initiated in partnership with Norwegian Teacher Initiative (NTI) and the Education Partnership Group (EPG), respectively. The rationale of the SEaIP was to provide the minimum requirements for establishing and operating a Pre-Tertiary Educational Institution (PTEI) for all learners' needs to be met. Regarding the SLiP, the rationale was to achieve the highest educational standards by providing provisional and full licensing to all private and public PTEIs in Ghana. According to the representative, "[Regarding] the temporary licensing, when we go to the schools to license them, the certificate that is issued is temporary. [Often] we give them a temporary license because they don't have all the requirements. It's for three years, I should say. So that if they are able to meet all the requirements after three years, they will be given a full license."

Concerning the digitalization initiative, NaSIA implemented a School Licensing and Inspection Management (SLIM) system. The representative explained that the rationale that led to the development of the initiative was the need to have an innovative technology for registering, inspecting, and evaluating all PTEIs across Ghana. However, the SLIMs was launched this year (2024)

by the vice president, and the authority has yet to start using the system. GoG initiated the policy through MoE to provide a central data management system for all schools to submit documents for licensing, collect data from schools, and generate inspection reports. A quote from a representative further explains this "I would say that [the digitalization initiative] generated SLIMs. Digitizing the whole process. And that one, I think it was this year that the vice president launched it. And we are now going live on it. So, we are now going to start using the SLIMs. We are the only people who manage our own data from the first to the last point of the data management system. And to add to that, the schools will have accounts on the SLIMs that they can access. When you go through it, it will ask you to provide some documents and all that."

Insights from qualitative interviews with the representative from NaSIA revealed that, of the 4 policies and initiatives implemented, T-TEL supported the implementation of the SEaIP through the recruitment and training of 84 inspectors this year across the country to address the challenge of inadequate Inspectors. T-TEL also supports the implementation of the Inspection Evaluation Framework by offering financial and technical assistance to review the Inspection Evaluation Framework and sensitize key stakeholders within the education sector. Regarding T-TEL's support in the implementation of the SEaIP, the representative said, "This year. With the support of T-TEL, we've recruited and trained about 84 inspectors across the country." On their support towards the review of the Authority's Inspection Evaluation Framework and provision of financial support for stakeholders to be sensitized the key informant retorted, "They provided human resource because these professors from the universities, they helped in the review of the document. TTEL's nature of collaboration and support was financial and technical; from the technical point of view, they brought human resources from universities." In relation to sensitization, the representative recounted that "...they [T-TEL] supported us to sensitize major stakeholders in the educational sector on that framework."

The inspection of schools is usually conducted in two phases. The first involves inspectors who visit the school to inspect, generate, and provide data on the situation of the proposed school. Then secondly, there is a back-end team or monitoring team that verifies that the data collected by the inspectors conforms with the expected standards. These inspections could be a whole school inspection, a performance inspection to check how schools perform academically, infrastructure inspections, and safety inspections. In discussing how the SEaIP and the SLiP are implemented, the representative mentioned, "I think we have two levels. One, the moment the inspections are done, a monitoring team follows up to the kind of inspections we've done so far. And then at the back end, myself and my team also monitor the kind of data that comes in to see whether it aligns. ...let me also say that when it comes to supervision, ... the inspections come in three or four forms. We have the whole school inspection, the performance inspection, that is how the academic, performing academically, then infrastructure, and safety."

In the representative's opinion, the policies and initiatives have positively impacted schools in terms of safety, brought about a change in behaviour among staff at NaSIA, and resulted in fast, easy, and efficient collection of data and feedback to the schools, especially the private schools through digitalization, and growth in NaSIA's staff strength. Here are some direct quotes from the interviews

- "I think one impact is the school safety. The safety of the children in the school. Because even for existing schools, we even get calls from where the school is situated. How the building is even structured and all that. At times we close the schools temporarily. I think we have done that to about one or two schools. Close them down for a period for them to put things in place before they reopen for the children to come."
- "...the digitization of the inspection processes. Previously, if you assigned inspectors to go on inspections, because of the nature of the data collection process, it was taking longer. But with the coming in of the system, the moment inspectors go on the field, then they collect the data. And it's making the work easier, simple. And then at the end, what is helping us is that now, the way data is collected, we believe it's more organized than usual. Then it's a faster process than the earlier times."

The in-depth discussion with the representative demonstrates that NaSIA generally had a good experience with T-TEL, except they would have preferred that T-TEL allowed them to directly manage and spend the funding provided. For instance, she said "Because with all the development partners that we were engaged with at the time, that was not how they were going about things. For T-TEL, they don't give you the money to spend. According to them, MasterCard does its things differently. if you invite stakeholders, they will pay the stakeholders themselves." Nonetheless, they are always ready to work with T-TEL to achieve the common goal of improving learning outcomes. In her words, "Definitely [we will work and attend T-TEL meetings] Our major aim is to achieve learning outcome. T-TEL is ready to support us to achieve this one. So I think because of that issue, we are always ready. We want to make sure that learning outcome has improved. The thing T-TEL is doing is to support this one [improve learning outcomes]. So anytime they are ready to support, we are also ready to work with them"

T-TEL was instrumental in implementing two of NaSIA's policies and initiatives. The financial and technical support contributed to increasing the staff strength of the authority, ensuring that about 84 inspectors across the country are equipped to implement the SEaIP. Also, the experts and academics T-TEL engaged to review the Inspection Evaluation Framework and the provision of funds to sensitize major stakeholders was a significant contribution. NaSIA is ever ready to collaborate with T-TEL to implement policies and initiatives that can transform the learning outcomes of learners. NaSIA, however, perceives that T-TEL is focused more on secondary education. They believe this limits their collaboration with T-TEL when they could work together even at the basic school level. According to

the representative of NaSIA, T-TEL should consider expanding their scope to basic schools, especially schools including the private schools that are sometimes neglected in rural areas.

3.12.3 Findings from National Council for Curriculum and Assessment

NaCCA is a governmental agency under the MoE. The agency was first established following the 2007 education reforms as an Advisory Board to the Curriculum Research and Development Division (CRDD) of GES. NaCCA has the mandate to develop national curriculum and assessment standards for pre-tertiary education other than the technical, vocational, and training educational institutions⁴².

Insight from the head of the curriculum directorate of NaCCA revealed that the agency had implemented policies and initiatives like the development of a secondary education curriculum, teacher resources to help integrate themes on global citizens' education, supplementary material to enhance literacy and assessment of learning resources. According to him, the major initiative was the development of the curriculum. As he retorted, "the major one is the development of the secondary education curriculum. Before that, we had engaged several stakeholders to know the direction they want education to go. And then we kicked off the writing of the curriculum by selecting a cream of writers across various organizations." Concerning other initiatives, this is what he had to say "We've been involved in the development of teacher resources to help teachers integrate themes on global citizenship education, which UNESCO spearheads through one of their agencies, Asian Pacific Research Center of Anatomy, that is based in Korea. ...We've also developed some supplementary material to help in the development of literacy. Again, something that is routine that we do is the assessment of learning resources."

According to the representative, the new standard-based curriculum was developed afresh but it benefited from the previous curriculum. When asked about the rationale for developing an entirely new curriculum, he said, "The reason behind this is to improve learning and teaching. If you ask me, the final result, like I said, is to improve learning outcomes, eventually leading to the kind of learners we want for our nation's development in the coming years."

The discussion revealed that MoE initiated the development of the standard-based curriculum which started with developing a framework. Through T-TEL, Mastercard offered mainly financial support towards covering the cost of writing up the curriculum for over a year. About the T-TEL's monetary

⁴² <https://nacca.gov.gh/who-we-are/>

support, he said, *"the nature of the support from TTEL was to take up the cost of the writing process in terms of... On an area paid to writers in terms of payment of the venues where the writing took place, in terms of some logistics that were used in the writing process. And covering the cost of all of the activities that were engaged in throughout the writing process."* T-TEL performed an initial assessment of the needs of NaCCA through interviews with officers and the Ministry of Education before providing financial support to assist the development of the curriculum, as is recounted in this statement *"So, I should say that the support process started, I think, when TTEL came to NACA, they also did an assessment on what kind of support we needed. By coming to interview officers to know exactly what support they could give. Then, I think, they engaged the ministry."*

NaCAA developed a framework to guide the implementation of the standard-based curriculum. The pre-tertiary curriculum framework also informed the drafting of the standard based curriculum. Stakeholders were engaged in the initial stages of curriculum development to understand the focus of education. Subsequently, T-TEL supported by setting up a panel and engaging writers comprising teachers, CoE tutors, university lecturers, and individuals from industry and faith-based organizations. Besides, the insights demonstrate a shift in the way curriculum writers are often recruited. According to the representative, Mastercard, through a formal letter, requested the universities to nominate or select individuals who were involved in the curriculum development process. The following verbatim further buttresses the points stated.

- *"The implementation, I should say, started with the development of a framework. So, the pre-tertiary education Curriculum Framework was developed by the Ministry [MoE], that was the foundation of the basic quality upon which the standard-based curriculum was developed. So, upon the development of the policy, we kicked off by engaging stakeholders to know exactly where the country wants to focus of education to be, where we wanted our education to go. Then, the process started, and we got support from Mastercard through T-TEL and then we started to set up a panel by engaging the various stakeholders who were involved in the writing. So, teachers, colleges, teachers from the classroom, colleges of education, universities, industry people, and even faith-based organizations."*
- *"This time what Mastercard did was actually to write to the various institutions to select their own reps to be involved in their activity. That is a clear departure from the way we selected writers in previous years."*

The key informant opined that in developing a curriculum in the future, it should not be as though one is reinventing the wheel, but such a curriculum could just emanate from a thorough review of the existing curriculum to save time and resources. The curriculum should be regularly reviewed also. Besides, he urged that pedagogies should be locally identified, tried, and worked for the learners in Ghana and not just 'copied' or 'picked" from elsewhere, especially from totally different contexts. Here

are some direct quotes from the KII on the future direction for developing curriculums and pedagogies.

- *"In future, I believe if we are developing curriculum, ...The process shouldn't be that we jettison the whole curriculum as though it serves no purpose. "*
- *"...each time look at the curriculum and which portions we need to either take out or improve. That will save us a lot of time."*
- *"I also think that as a nation, in terms of pedagogy, all of us should, from those of us who are curriculum writers through to lecturers and everybody in the education space, we should begin to identify some kind of pedagogies that we are developing locally that our learners can relate to. Then, implement them in our schools rather than always picking pedagogies from elsewhere and using them."*

The PLC, based on interactions with teachers during field visits, is positively affecting teachers because it makes some teachers realize the need to change their way of teaching and learning. It also serves as a platform that encourages preparation before going to the classroom to deliver a lesson. In the words of the NaCCA representative, *"As I was telling you, we have not done any research on visiting schools to find out whether the PLCs are going on and engaging with teachers and writers involved in the document's writing. We are getting feedback that suggests that it is a good activity that is taking place, and it is even having positive effects on some teachers already because they realize that we need to change the way we are teaching and learning and they feel that it is a good platform for teachers to prepare before going to class."* Again, at the school level, reports from the field and visits to the field show that the initiatives have positively impacted teacher attendance. This is what the representative said on its impact on teacher attendance *"...through the activities that we are doing, again with T-TEL, where we go for quarterly meetings, the report that comes suggests that yes, these activities that we are doing are impacting positively on teacher attendance."*

Another impact is that the curriculum does not emphasize the development of only cognitive domain but also recognizes and encourages the development of social, emotional and behavioural domains. On this, he said *"Last week, we were in Sunyani to develop the departmental PLCs. It came up, and teachers were happy about the fact that this time we are looking at the social, emotional and behavioral domains because all teachers were there and also agreed that, yes, that is an area we are not doing too well and therefore we needed to look at that."*

According to the representative NaCCA, his experience with T-TEL is summarized in this statement *"My experience working with T-TEL has been good. I think we've had a good and collaborative working experience."* He would definitely want to work with T-TEL again because both organizations have worked collaboratively and resolved any issues that might have arisen amicably. Regarding their support, he retorted *"The support they have given us has been worthwhile."*

NaCCA's major initiative, the standard-based curriculum was implemented over a year with support from T-TEL. Mainly T-TEL provided financial assistance to cover the writing of the curriculum. The rationale for the curriculum was to improve learning outcomes. Though NaCCA is yet to conduct a scientific assessment of the impact of the curriculum, feedback from reports, meetings, and field visit show some positive changes such as improvement in teacher attendance and teacher preparation before lessons fostered by the PLCs. NaCCA is always ready to collaborate with T-TEL but recommends they empower teachers through the curriculum's social, emotional, and behavior domains to be self-confident and make decisions that promote learning within their classrooms.

General insight

NaCCA thinks T-TEL should be open and foster discussions to get the best ideas and information that would help achieve its objectives. Here is a verbatim of what he said *"My recommendation to T-TEL, so if you are engaging maybe in NaCCA again, the break-free stages should be enhanced. And, yes, everybody should engage in the process should be listened to. Sometimes, there are people, let me put it in quotes, that seem to be a bit critical, right? Yes, but their contribution is very, very important, right? So, everybody should be allowed to speak their mind despite how they feel or behave. The most important thing is to get the information or to get the expertise of the person and run with."* The head of the Curriculum directorate thinks T-TEL has supported NaCCA very effectively and that their technical knowledge and the impact on education in Ghana has been great. A quote on that reads *"...from my studies and the work I do as a curriculum person, a lot of the things they [T-TEL] are assisting agencies to do have been done the first time. Even though in some parts of the world these are not new things in terms of curriculum development, yes, here in Ghana, many of the things we are doing now are new. So, I would say yes, in terms of their technical abilities [T-TEL is] up there."*

3.12.4 Findings from Ghana Education Service

The Ghana Education Service (GES) holds the mandate of implementing national pre-tertiary educational⁴³ policies and programs to ensure inclusive and equitable access to quality formal education for all Ghanaian children, regardless of tribe, gender, disability, religious beliefs, or political affiliations. Established in 1974 as part of Ghana's Public Service and subsequently amended, GES aligns its objectives with the National Policy Objectives outlined in the Education Strategic Plan (ESP)⁴⁴. These objectives include enhancing access to education at all levels, imparting life skills and

⁴³ National Pre-tertiary Education Curriculum Framework for developing subject curricula, May 2018. Retrieved from <https://nacca.gov.gh/wp-content/uploads/2019/04/National-Pre-tertiary-Education-Curriculum-Framework-final.pdf>

⁴⁴ Education strategic plan 2018-2030. Ghana. Retrieved from <https://www.globalpartnership.org/node/document/download?file=document/file/2019-05-education-strategic-plan-2018-2030.pdf>

managing personal hygiene, family life, health, and gender issues, improving teaching and learning quality, and enhancing the management of educational service delivery. Since 2017, Ghana's basic education has expanded to incorporate secondary education under a new government policy, ensuring that Junior High School graduates progress to Senior High School based on comprehensive criteria beyond the BECE results.

Building upon the initiatives of previous years, the 2023 qualitative findings from the annual survey highlight significant advancements in Ghana's secondary education landscape, driven by collaborative efforts between the GES and T-TEL. Key among these advancements is the continued implementation of transformative policies and initiatives aimed at enhancing the educational quality and leadership effectiveness across SEIs.

According to insights gathered from the GES representative, T-TEL's support has evolved in 2023, focusing prominently on strengthening financial disbursements and expanding training programmes under the Secondary Education Transformation Programme (SETP)⁴⁵. The GES highlighted the targeted support provided to 12 previously underperforming schools through SETP, which has been instrumental in aligning SIPs with increased funding allocations. This strategic alignment has facilitated rigorous monitoring and reporting, resulting in measurable improvements in leadership capabilities and institutional management practices compared to previous assessments. Please see a quote from the GES representative below:

"T-TEL has really stepped up their support this year. We've seen more funding coming through for our school improvement plans, which has allowed us to make concrete changes in how we manage our schools".

Regarding leadership and management training initiatives, the GES representative emphasized T-TEL's interventions' expanded scope and impact in 2023. Rigorous orientation programmes tailored for newly appointed school heads have addressed longstanding gaps in administrative skills, fostering a culture of accountability and proactive leadership across SEIs. *"...the training for new*

⁴⁵ The Ministry of Education (MoE) and the Ghana Education Service (GES), with financial and technical support from T-TEL through the Mastercard Foundation, are currently working with 12 Senior High and Senior High Technical Schools to bring about improvements in performance and learning outcomes through the Secondary Education Transformation Programme (SETP). SETP has been running for a little over a year now piloting improvement approaches in these 12 schools which will be scaled nationally by MoE and GES in line with the Secondary Education Strategy 2022-2025.

SETP is based on the principle that Senior High Schools (SHSs) and Senior High Technical Schools (SHTSs), and the stakeholders involved in their management, operations and governance are best placed to understand the issues inhibiting student attainment within their schools and that, with support and facilitation, they can take the lead in owning and developing solutions to their challenges.

The overall aim of the SETP is to ensure that students in SETP schools are equipped with relevant skills and competencies to progress and succeed in further studies, the world of work and adult life.

school heads has been thorough and practical...It's not just about theory; they're learning how to manage real-life challenges in our schools."

This enhanced approach contrasts with previous years, underscoring the progressive evolution of capacity-building efforts facilitated by the LiT programme. Furthermore, national-level training initiatives supported by T-TEL have extended their reach to over 700 SEIs, significantly enhancing leadership competencies and operational efficiencies essential for driving educational excellence nationwide. *"Our leadership training sessions have reached more schools this year. It's making a real difference in how our schools are managed and how teachers are supported"*.

The PLC initiative by T-TEL aims to help teachers *"develop their potentials, learn new methodologies, new strategies, new pedagogies within themselves, discuss their challenges pertaining to their specific areas of teaching before they go back to teach their learners"*. The initiative has significantly improved teacher attendance and methodological skills at the school level, positively impacting students' literacy, as evidenced by students who *"couldn't read four-letter words, five-letter words in secondary school, form one,"* but *"through the research that T-TEL did, they were able to read."* Despite challenges such as inconsistent attendance due to school schedules and the inability to penalize non-attending teachers, T-TEL's extensive capacity-building efforts, technical expertise, and provision of free resources have fostered a culture of continuous professional development.

In comparison to the 2022 findings, the 2023 survey reveals marked improvements in the efficiency and impact of T-TEL-supported initiatives. The scaling up of leadership training under SETP and national programmes has yielded tangible enhancements in educational governance and administrative effectiveness.

Challenges such as financial mismanagement, previously a significant barrier in 2022, have been mitigated through strengthened oversight and accountability measures implemented by GES, resulting in a more transparent and responsible financial management culture among school administrators. *"There's been a noticeable improvement in how funds are managed since we started using T-TEL's monitoring tools. It's helped us tighten our financial controls"*.

Moreover, the integration of digital technology in secondary education has gained momentum in 2023, driven by initiatives like the one-teacher-one-laptop policy. Teachers now report enhanced digital literacy and streamlined lesson preparation processes, reflecting a positive shift in educational practices facilitated by T-TEL's strategic interventions, *"With our new laptops, preparing lesson notes has become much easier and quicker. It's definitely improved how we teach in our classrooms"*.

Community engagement in school monitoring and supervision has also intensified, demonstrating increased stakeholder involvement and ownership in educational outcomes. This participatory approach has been pivotal in promoting transparency and effective governance at the grassroots level, reinforcing GES' commitment to achieving equitable access to quality education for all

Ghanaian students. *"Parents and community members are more involved in our school activities now. They want to see improvements, and that's pushing us to do better".*

The GES perceives T-TEL as a highly valuable and reliable partner in education, describing them as *"a force to reckon with"*. T-TEL is commended for its expertise and the precision with which it engages the right individuals, highlighting its *"top-notch"* technical knowledge. The impact of T-TEL on secondary education in Ghana has been overwhelmingly positive, with significant improvements noted in teachers, learners, and the entire educational system. The GES interviewee mentioned, *" We are just hoping that as we get to the middle [of the program] and to the tail end, as we have started, it will continue"*. The GES values the partnership with T-TEL and hopes their support will persist throughout the program's duration.

3.12.5 Findings from National Teaching Council

As an agency under the Ministry of Education, the National Teaching Council (NTC) is mandated by the Education Regulatory Bodies Act, 2020 (Act 1023) to ensure professionalism in teaching in Ghana. The agency's functions include registering and providing licensure certificates to teachers; developing and reviewing the standards and code of ethics of the teacher profession periodically; designing the framework for the continuous professional development of teachers; and ensuring the maintenance of an updated database for teachers.

During the survey, the representative of the agency revealed that through support from T-TEL, the organization worked in collaboration with the National Service Secretariat to train national service personnel across eight (8) centers nationwide, which were keenly monitored by some tertiary institutions. This training presented service personnel in the teaching sector with a year temporal license, which permits them to teach in schools in compliance with the Education Act, section 79, as narrated here by the representative that... *"if you specifically look at section 79 it prescribes that you cannot enter into the classroom to teach if you are not licensed. ... so, for those doing the National Service, we decided to give them the temporary license that could last them for one year so that they will be able to do the National Service."* Training was also provided on pedagogy components for service personnel with a background in subjects such as mathematics to be equipped with basic skills to manage classrooms, especially in the event of the new curriculum, which requires the administration of certain methodologies in lesson delivery. This is a quote from the representative ... *"but the methodology aspect is what they lack, so someone will do maybe BSc Mathematics, but the person lacks the pedagogy component so that is why we collaborated with National Service so we would train those people on at least minimum pedagogy on the basics needed in managing classrooms."* In regards to its impact, although much is not known from the representative on whether

or not another team went to the classroom to observe these trainees, the feedback during the training revealed that the trainees benefitted immensely from the classroom etiquette and techniques which they did not get from the universities and wished the training could be extended. The representative stated that ... *" what I can say is that the reports that we got back from the trainees themselves were for us to extend the program because they were benefiting a lot on some of the classroom etiquettes and the techniques that they didn't get in the course of their training at the universities."*

Secondly, the agency contracted the University of Winneba to roll out a study on the licensure examination. The rationale that led to this initiative was due to airwave information that there were some issues with the licensure examinations and concerns about student-teacher performance. According to the representative, the findings from the study revealed that with the licensure examination, student-teachers from the colleges of education performed better than those from the universities. They attributed this to the fact that in colleges of education, the national teaching standard is a guide that enables teachers to have practical experiences. Therefore, in the event of the licensure examinations, students in the colleges of education performed better if the questions for the licensure examination were more practical-oriented. This is a verbatim quote from the representation... *"we contracted University of Education Winneba to do the study on the licensure examination because we were hearing people in the airwaves were having issues with it and then some of the students, depending on the outcome of the results... the president of the Conference of Principals of Colleges of Education (PRINCOF) said he is very sure that the colleges use the NTS, the National Teacher Standards to teach and so it makes the teachers there more practical because the questions for the licensure exam are practical in nature, so he was of the view that that is how come candidates from the colleges understood the questions better."*

Over the last two years, another initiative the agency undertook was printing and distributing 20,000 copies of the NTS to teachers at the senior high schools and revising the NTS through support from T-TEL. The agency used various means to facilitate the distribution across universities and colleges of education. The representative also confirmed that through support from T-TEL, they are collaborating with the universities to input their feedback to revise the curriculum to ensure all the gaps in secondary-level education are cleared.

In addition to the above, another initiative the agency introduced with support from T-TEL is the integration of ICT into the methods of teaching. According to the representative, the rationale behind the initiative stems from the impact of the COVID-19 pandemic in the education sector. They realize that some teachers became incapacitated due to the shift from face-to-face to using virtual platforms to facilitate teaching and learning. Therefore, NTC designed a model integrated across the various subjects to enable teachers to identify how to integrate ICT in lesson delivery at the secondary cycle institutions. This is what the representative had to say ... *"we realized that with COVID only those who were technologically inclined in IT, could teach online so we thought that if something like that*

should happen again and our learners have to stay at home, then we are going to be hit. So, we thought of integrating ICT into the methods of teaching."

The survey also sought to determine the challenges the agency faced in the execution of its activities, and according to the representative, the current challenge they are encountering has to do with the integration of ICT in lesson delivery. The representative revealed that teachers have complained about weak laptop batteries on the 1 teacher 1 laptop policy, the lack of internet coverage in all parts of the country, and the need for zero-rating on educational sites due to the high cost of internet data. This is what the representative shared during the interview ... *"laptops are getting damaged, some said their batteries don't last long, also there is the lack of internet coverage at certain places. So, you go to certain places to let the teachers feel ICT integration but there's no internet coverage So you just talk and talk and you will not get the network to demonstrate exactly what you mean by them going online to get certain resources to assist them in their teaching. Some of the teachers think that if you are bringing this to them you should give them money to buy data".*

When asked if the agency would collaborate with T-TEL again during the survey, the representative said they would always want to work with T-TEL. He described T-TEL as the financial muscle that enables them to implement policies and programs. Here is what the representative mentioned during the interview... *"for instance, this NTS that we have revised, if it goes through all the processes and we are supposed to distribute it NTC may not get ready cash to be able to print a lot of copies and distribute so it is going to be a very fresh document and we have over 400,000 teachers so if you want every teacher to get a copy it will clear our budget so we have to be devoting some money every year to be sending maybe 10,000, 10,000 it will take maybe 10 years to be able to print just the standards but if T-TEL comes in we will be able to achieve that in no time."* Concerning how to improve their working experience, the representative mentioned that they will need to provide the agency with the annual calendar of activities they intend to undertake to enable them to fit that into their activities as well.

4.0 DISCUSSION AND IMPLICATION OF FINDINGS FOR POLICY AND PRACTICE

4.1 Discussions and Recommendations

Findings in this annual survey identified a number of challenges which cut across the implementation of all four literacy proficiencies in Reading, Math, Science and Digital technology. For these challenges, some recommendations have been advanced in this section, as the way forward.

Recommendations on inadequate infrastructure for schools

- For a very conducive teaching-learning environment to guarantee an improved academic performance for students, there is the need to provide a number of infrastructural facilities reported as lacking or inadequate in the researched schools. Sanitation is one of them, and school heads need to liaise with their school Boards of Governors to engage and seek financial support from sources, such as their PAs and Alumni, to undertake these projects. The construction of very good and decent toilets and urinary for both teachers and students to address poor sanitation is key, the absence of which can result in irregular school attendance (especially among the females), deteriorating health and overall well-being of those using that environment.
- Besides, challenges related to lack of adequate classrooms and dormitories can be taken up by the government, to construct more structures to alleviate the problem of overcrowding. School boards can also seek the assistance of other benevolent philanthropists and well-to-do persons in these communities, to construct more classroom and dormitory blocks, and furnish existing ones in these challenged schools. Apart from that, government also needs to budget for and ensure the building modern ICT labs in all SEIs across the country and deploy the necessary equipment/tools/gadgets like desktop computers, laptops, mobile projectors and screens to equip the ICT labs. These labs need to include uninterrupted Internet connectivity installations, not only in the ICT labs, but also in classrooms to support ICT integration, the lack of which would hinder effective teaching and learning. School ICT labs need to have policies to ensure free access and accessibility to students, in particular. These labs, if well-equipped, would address the digital literacy challenges mentioned in the survey findings to improve student digital literacy and proficiency.
- To promote reading literacy, there is a need for the government to build new libraries across the country in schools that have none, refurbish existing ones, and provide all of them with relevant and appropriate materials, such as story books, magazines, journals, pamphlets, supplementary readers and newspapers, which students can borrow to improve their reading skills. These educational materials could also be sourced from the schools' alumni and parents, who can assist, NGOs like T-TEL via Mastercard Foundation, Big Win, USAID, UNICEF and other institutions and organisations, which are sponsors of major educational programmes already. These libraries need to be efficiently run by at least two qualified librarians, employed by GES - one working during the day and the other after classes in the afternoon till evening.

- Other important infrastructural facilities the government needs to build in schools to alleviate challenges hindering proficiency are science laboratories. These need to be up-to-date labs, furnished with modern equipment. Besides, GES needs to employ qualified lab assistants to help teachers set up the labs for students' experiments and lessons. Apart from that, it will be prudent for government to revive all the Science Resource Centres across the country with modern equipment and reagents to serve groups of schools within a specified catchment area, which do not have the labs in their schools. It is recommended that government buy Science resource centre buses to transport students probably the final years and their teachers to and from the resource centres.

Recommendations on inadequate learning resources

- The survey revealed that schools had inadequate, and in some cases, a shortage of teaching-learning resources, limited access to updated textbooks, as well as lack digital and ICT resources that facilitate teaching and learning. The MoE, through NaCCA is responsible for developing and providing approved textbooks for schools and other supplementary readers assessed by subject experts in the country before they are admitted into the schools. It is recommended that approved textbooks reach schools promptly and timeously before the beginning of each academic year to relieve students of having to be without textbooks while lessons are conducted.
- For Math literacy for instance, students lack working tools like Math sets and calculators. It is recommended that parents assist their children/wards to provide them in this regard and not necessarily rely on the government. However, if the schools have the funds to provide the students, they can do that at a subsidized price, as they would have bought them in bulk at reduced prices.
- With regards to students' science literacy proficiency to improve and attain expected levels, teachers can source for these resources and their accompanying experiments, by researching the Internet for curriculum topic-based experiments. These practical activities can be projected on screens for the class to alleviate the perceived difficulty and bulkiness of science that the students expressed in the survey. Where possible, the teachers can adopt improvised methods to guide students through the practical lessons if resources from the government are not immediately forthcoming. This is where the provision of a good science lab, equipped with computers, projectors and screens and connectivity will play a vital role. Schools in a catchment area can make use of science resource centres close to them, if they do not have the necessary equipment and reagents to conduct experiments stated in the curriculum. They can also form science clubs in the schools and organise science quiz competitions, making them very active at school level to upgrade their proficiency levels in science literacy.
- For digital literacy to approach appreciable levels, there is the need for the schools to provide ICT resources and other digital technologies for schools' ICT labs and classrooms. Similar recommendations advanced for science literacy apply here if the challenges reported, such as overcrowding in classrooms, lack of digital tools, lack of electricity in the classrooms, nonfunctional labs and lack of connectivity are to be addressed.

Recommendations on curriculum content overload

- In the survey, teachers, students, parents and other stakeholders pointed out the existence of Content Overload in the SHS curriculum. It is worth noting that issues of Curriculum Content Overload are usually addressed during curriculum reviews, revisions and the development of new curricula. In 2023/2024, NaCCA had engaged the collaborative efforts of curriculum experts/educators to review and revise the existing SHS/SHTS Objective-based curriculum. In the process, the subject panels worked together to identify common learning outcomes that transcended subject boundaries to aid them in reducing any redundancies. While commonalities were addressed, the subject panels ensured each subject retained its unique learning outcomes. The newly developed standards-based curriculum is currently at its final stages of completion, going through trial testing in a number of schools to iron out any discrepancies before it is rolled out for implementation at the beginning of the next academic year, 2024/25. The NaCCA had addressed the curriculum content overload issue before teachers, students, parents and other stakeholders raised it during the survey period.

Recommendations on low-level Literacy and proficiencies in students

- Regarding students' low-level literacy and proficiency, findings revealed the lack of requisite foundational knowledge in reading, math and science literacies. For instance, in Reading literacy, some students were reported as being unable to identify two-letter words or read three letter words. Currently, the Ghana Book Trust (GBT) is in collaboration with the GES and the Ghana Library Authority and other stakeholders to build capacity among teachers in public Basic schools in deprived districts to develop and promote the reading culture of children. It is also recommended that this gesture be extended to SEIs to motivate reading among students.
- Besides, there is the need for heads of schools to organise remedial classes for students, with a particular focus on weaker students, to help them upgrade to the expected proficiency levels. Apart from that, schools need to form debating clubs to organise debates for students, as speaking, writing, and reading are expected to go hand in hand. The schools can also introduce reading competitions, allow teachers to come together to design a timetable that allows them to move their classes, once in a week to the library for one period each, if possible, to enable students to get more acquainted with 'all-books' environment to learn how to read. Teachers can also collaborate with students to establish reading clubs to encourage reading among students, organise excursions and tours to historical and geographical sites, to be followed by students writing group reports on their experiences on such educational trips. The teacher in their individual classes will allow groups to read out their reports in class and in turns to the hearing of their colleagues, during reading club periods, with the teacher supervising and moderating the activity. The teacher needs to make this activity a reading competition, with guidelines and at the same time, placing much focus on students whose proficiency level in reading is low. Members of the first three groups who emerge more proficient will have the opportunity to read the Bible/Koran at the school assembly at morning worship. At the end of the school year, best readers need to be rewarded with book prizes at the school's Speech and Prize-giving day to encourage others lagging behind to pull their weights.

- At the regional, District and Community levels, the public libraries need to be revamped and new ones built and made attractive to entice students. These libraries will be expected to be run efficiently by the Ghana Library Authority to serve the public and students in particular. It is recommended that these libraries be run to encourage students to freely borrow books to be returned every fortnightly before another one is borrowed. It is also recommended that the libraries monitor how regularly each individual student comes to borrow books so that at the end of the year, the Ghana Library Authority can organise regional durbars to reward deserving readers. These measures will encourage students to form reading habits and go a long way to improve their reading proficiencies.
- In Math literacy, students are unable to link what they studied at JHS with similar concepts at the SHS to know that the SHS is just a buildup on the JHS work. There is the need for their teachers to help them establish these links, using very simple innovative teaching strategies.
- In science literacy, students perceive science as very difficult and bulky, but there is a need for teachers to apply the innovative teaching methods and strategies they are now getting acquainted with through the use of the NTS manual and PLC sessions to explain the concepts to them in more practical terms than in the abstract.

Recommendations on poor teaching methods that reduce students' confidence in a teacher

The survey findings revealed that some students have lost confidence in some of their teachers who for instance, read directly from the textbooks the student also has already.

- With support from T-TEL and the NTC, the National Teachers' Standards (NTS) manual has been produced and introduced to SHIs and SHTS schools as one of the major interventions for teachers across the nation. It is to acquaint teachers with the required teaching standards to meet international standards for effective teaching and learning. Complementary to the use of the NTS is the introduction of the PLC sessions, which teachers are finding very useful, as they are now adopting more innovative pedagogies to make their lessons more participatory. The PLC sessions ensure that classroom teachers are improving their teaching and learning skills and competencies, which will go a long way to improving the students' expected learning outcomes and proficiencies. The question of teachers going to class to read out textbooks to their students and see it as a teaching method will be a thing of the past.
- There is also the need for School Improvement and Support Officers (SISOs) who operate mainly at the basic level to be sufficiently funded by the District Education Directorates, to enable them to have easy and regular mobility around schools under their jurisdictions, to ensure that teaching and learning are conducted effectively and emerging challenges addressed, so the students can receive a good foundational grounding in reading, math, science and ICT literacies before they enter the SEIs.
- Apart from that, there is the need to revive regular School Performance Appraisal Meetings (SPAM), at the SHS/SHT levels, as their main aim is to improve teaching and learning in schools. In addition, even the NTC/T-TEL collaboration had produced the Professional Learning Communities (PLC) handbook being implemented in all SHS and SHTS across the country, with the aim to improve the teaching and learning skills and competencies of teachers. These interventions are expected to further improve expected teaching-learning outcomes.

Recommendations on long distances from home of teachers and students to school

- Findings from the survey revealed that day schools or schools with no boarding facilities make students unable to stay extra hours for studies. They go home after school, rendering interventions such as extra classes ineffective. Besides, the locations of some of these schools are reported to be far from town, and some students report that they have inadequate funds for transportation to and from school. It results in irregular school attendance, leading to limited teacher-student contact hours and poor academic performance. Therefore, the government needs to make it a policy to provide all day schools and those with limited boarding facilities, with permanent and regular school bus services to transport students and their teachers to and from school. Transport fares on these buses can be subsidised considerably to make it affordable for students in particular, and the fares collected can be supplemented and used for fuel and maintenance of the buses.

Recommendations on teacher motivation and retention in schools

- The survey findings revealed that teacher motivation is directly linked to teacher competence on the job and the expected learning outcomes of the student. Thus, when teachers feel motivated on the job, they do their utmost best, which positively affects the students' quality of learning. Teachers who feel that they are not motivated enough to stay on the job permanently cited low salaries, inadequate teaching and learning resources and equipment to work with, lack of enough infrastructural facilities (i.e., limited classrooms and dormitories blocks, and science and ICT labs), inadequate or non-existent toilets and urinary, and inadequate or lack of accommodation. Considering these hindrances to effective teaching and learning, the government needs to provide attractive salary bonuses to the teachers, especially those posted to rural/deprived areas, as part of the incentive package. Housing stock, in the form of classroom and dormitory blocks, needs to be constructed to ease out accommodation challenges posed by the large enrollments, since the inception of the Free SHS programme. The wealthy in the society, who are philanthropists and have education of these students at heart, and the school's alumni, can donate classrooms, dormitories, science and ICT labs to schools as part of their good jester to ease pressure on these facilities to improve teaching and learning. Science lab assistants must be hired to run the labs to ensure that the equipment and users are protected from damage or harm. Likewise, ICT lab assistants, both soft and hardware professionals, need to be employed by GES to man the labs to ensure the equipment is updated and upgraded. There is also the need to equip the schools with teaching and learning resources for effective teaching and learning. Heads of schools can rely on their PTAs and/or alumni to provide them with the needed resources. The heads of schools can also fall on the regional assembly through the Regional Education Directorates to seek assistance for funding.
- On teacher accommodation, the government can collaborate with the MoE/GES, viable banks, NGOs, and the teacher unions to come up with a policy to construct bungalows for teachers, especially in deprived areas and rent them out to them at subsidized rates to retain them on the job. Also, the annual best teacher award scheme can target teachers serving in the

deprived/rural schools more, and not always on teachers from the already-made schools in big cities and towns, who already have most of the facilities. Teacher motivation can also come in the form of granting teachers in the deprived areas 'Study leave with pay' after just two years of teaching instead of the usual five years.

Recommendations on admitting students with very low BECE grades

- Findings from the survey also revealed that some heads of schools admitted some students with BECE grades as low as aggregate between 40 and 50. According to the school heads, these students have difficulty coping with the secondary school programme. Remedial classes are appropriate for them for now, but NaCCA has purposely developed an upcoming '*Intervention Curriculum*' in Math and English language to cater to students with such weak BECE grades. This supplementary curriculum will be rolled out together with the newly developed standard-based curriculum, in all secondary schools across the country at the beginning of the next academic year, 2024/25. Therefore, heads of secondary schools will, as a matter of policy, be made to take this intervention on board and incorporate it into their main school timetable. It is a 3-year but lighter curriculum that will be implemented for them to run concurrently with the main SHS/SHTS curricula until they can upgrade themselves to the required achievable standards expected of them.

Recommendations on home/parental support

- The survey also reported some other challenges hindering high proficiencies in the 4 literacy areas. They are the lack of home support/motivation for students to read or practice what they learn in school, as well as general parental negligence, i.e. lack of home support in buying learning materials for the children and monitoring and supervision of extra tuition for them. The survey also revealed the lack of motivation from relatives and from some parents who are illiterates and do not speak English.
- It is recommended that more active parental involvement in school activities such as PTAs and SPAMs be encouraged for effective running of schools. Parents can only be current with their children's schooling and general welfare, if they fully participate in the activities of their children's schools. Where parents are illiterates, they can still be of assistance to their wards schooling, if they get fully involved and show some concern, by integrating the household chores their ward do with school work and help them get extra tuition from within known persons capable of helping them within the community, probably for a fee. Also, parents need to show a great deal of concern with what their children are learning and required to provide in school, by communicating with them regularly on issues pertaining to their schooling and education. Illiterate parents can seek the help of the educated parents around to understand what is going on in their wards' schooling and education as a whole.

Addressing the challenge of Inadequate number of teachers in some schools.

- In addressing the challenge of a limited number of teachers, there is the need for school heads to report this situation promptly to their Regional Directors of Education to forward such requests to the Ghana Education Service (GES) Headquarters for necessary action to be taken, to post teachers to their schools. Some teachers refuse to report at their stations, but there is the “District Sponsorship Scheme” the school head can take advantage of. The scheme allows Districts to train their candidates at Colleges of Education and give them automatic appointments in their District schools. Now that the Teacher Training Colleges (TTs) have been upgraded to the tertiary status of Colleges of Education awarding degrees, graduates from such colleges qualify to teach in secondary schools. Heads of schools that suffer teacher shortages can take advantage of this scheme to feed their schools with teachers.
- In sum, the recommendations advanced as a way forward are linked with the challenges revealed in the findings of the survey. These recommendations include providing adequate infrastructure and appropriate and relevant learning resources for schools, repairing overloaded content of the curriculum, and putting various measures in place to raise students’ low-level literacy skills and proficiencies. Other recommendations center around poor teaching methods that erode student confidence in some teachers and long distances of school locations from the homes of teachers and students. Recommendations have also been advanced to handle issues pertaining to poor teacher motivation and retention in schools, admission of students with very low BECE grades, the lack of home/parental support, and the inadequate number of teachers in some schools. Suppose these recommendations are directed into policies and effected judiciously. In that case, teachers will become more efficient and pro-active in their teaching, and students will become more proficient in their Reading, Math, Science and Digital literacy skills.

ANNEXES

Annex 1: Indicator scoring rubrics



TSHEL Indicator
rubrics.rar

Annex 2: Data collection tools



Pilot Study Report -
T-SHEL (1).docx



Instruments for
T-SHEL Annual Survey

Annex 3: Additional tables

Table A3.1 Proficiency in reading by region (%)

Region	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Upper East	21.7	8.3	8.3	26.7	35.0
Bono	19.1	11.9	22.6	21.4	25.0
Eastern	16.8	12.9	19.6	21.8	29.1
Central	15.0	15.8	31.6	24.1	13.5
Ashanti	8.7	18.3	20.1	23.6	29.3

Greater Accra	6.9	13.8	15.5	24.1	39.7
Northern	6.7	20.0	18.3	11.7	43.3
Volta	5.6	9.4	22.4	34.6	28.0
Western	5.6	5.6	25.0	25.0	38.9
Western North	4.2	4.2	16.7	33.3	41.7
Ahafo	0.0	20.8	12.5	8.3	58.3
Bono East	0.0	4.2	14.6	12.5	68.8
North East	0.0	2.8	2.8	16.7	77.8
Oti	0.0	5.6	8.3	13.9	72.2
Savannah	0.0	0.0	8.3	22.2	69.4
Upper West	0.0	0.0	0.0	25.0	75.0

Table A3.2 Proficiency in reading by school (%)

Name of school	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Notre Dame Girls SHS	91.7	0.0	8.3	0.0	0.0
Diaspora Girls' SHS	83.3	8.3	8.3	0.0	0.0
Kwahu Tafo SHS	75.0	25.0	0.0	0.0	0.0
Notre Dame Seminary SHS	75.0	25.0	0.0	0.0	0.0
Brakwa SHTS	50.0	16.7	8.3	25.0	0.0
Ejisuman SHS	41.7	16.7	0.0	16.7	25.0
Awutu Bawjiase Community SHS	33.3	41.7	16.7	8.3	0.0
Prince of Peace Girls SHS	33.3	16.7	33.3	8.3	8.3
Agate Community SHS	25.0	8.3	25.0	16.7	25.0
Apeguso SHS	25.0	25.0	0.0	25.0	25.0
Boso SHTS	25.0	16.7	25.0	25.0	8.3
Business SHS	25.0	41.7	33.3	0.0	0.0
O.L.L. Girls SHS	25.0	16.7	16.7	33.3	8.3
Osei Adutwum SHS	25.0	25.0	33.3	16.7	0.0
Kwamang Presbyterian SHTS	23.1	61.5	7.7	7.7	0.0
Lashibi Community Day SHS	18.2	9.1	18.2	18.2	36.4
Adankwaman SHS	16.7	0.0	66.7	16.7	0.0
Anlo Awomefia SHS	16.7	25.0	50.0	8.3	0.0
Bonzo-Kaku SHS	16.7	16.7	50.0	16.7	0.0

Name of school	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Jukwa SHTS	16.7	33.3	0.0	33.3	16.7
Odoben SHS	16.7	8.3	50.0	25.0	0.0
Our Lady of Providence SHS	16.7	8.3	41.7	8.3	25.0
Tema Manhean SHTS	16.7	25.0	33.3	25.0	0.0
Tijjaniya SHS	16.7	50.0	33.3	0.0	0.0
St Augustine SHS	16.7	25.0	8.3	16.7	33.3
St. Stephen's Presby SHTS	9.1	18.2	0.0	36.4	36.4
Tongor SHTS	9.1	0.0	9.1	36.4	45.5
Awutu Winton SHS	8.3	8.3	16.7	16.7	50.0
Ayirebi SHS	8.3	16.7	25.0	41.7	8.3
Diaso SHS	8.3	41.7	41.7	0.0	8.3
Klo Agogo SHS	8.3	8.3	41.7	16.7	25.0
Kwanwoma SHTS	8.3	8.3	16.7	25.0	41.7
Maame Krobo Community SHS	8.3	0.0	0.0	25.0	66.7
Manso-Amenfi Community Day SHS	8.3	8.3	8.3	16.7	58.3
Moree Community SHS	8.3	8.3	75.0	8.3	0.0
Nkenkansu Community SHS	8.3	25.0	16.7	16.7	33.3
Mampong Presbyterian SHS	8.3	16.7	58.3	16.7	0.0
St. Ann's Girls SHS	8.3	41.7	25.0	25.0	0.0
St. Charles SHS	8.3	41.7	33.3	16.7	0.0
St. John's Integrated SHTS	8.3	0.0	8.3	41.7	41.7
Nkawkaw St. Michael's SHS	8.3	0.0	0.0	16.7	75.0
Ogyeedom Community SHTS	7.7	7.7	15.4	46.2	23.1
Adjen Kotoku SHS	0.0	0.0	8.3	25.0	66.7
Adugyama Community SHS	0.0	8.3	16.7	50.0	25.0
Afife SHTS	0.0	0.0	0.0	58.3	41.7
Agotime SHS	0.0	8.3	58.3	16.7	16.7
Ahamansu Islamic SHS	0.0	8.3	0.0	16.7	75.0
Akokoaso SHTS	0.0	16.7	25.0	50.0	8.3
Amantin SHS	0.0	0.0	0.0	8.3	91.7
Aperade SHTS	0.0	0.0	8.3	16.7	75.0
Ayanfuri SHS	0.0	8.3	8.3	58.3	25.0
Bassa Community SHS	0.0	0.0	8.3	8.3	83.3
Bimbilla SHS	0.0	8.3	8.3	33.3	50.0
Birifoh SHS	0.0	0.0	0.0	33.3	66.7
Bosomtwe Oyoko Community SHS	0.0	33.3	16.7	50.0	0.0

Name of school	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Diamono SHS	0.0	0.0	8.3	58.3	33.3
Esiama SHTS	0.0	0.0	8.3	16.7	75.0
Han SHS	0.0	0.0	0.0	50.0	50.0
Ibadur Rahman Academy SHS	0.0	16.7	8.3	41.7	33.3
Jacobu SHTS	0.0	0.0	25.0	16.7	58.3
Jema SHS	0.0	16.7	25.0	16.7	41.7
Kete Krachi SHTS	0.0	8.3	8.3	8.3	75.0
Kofiase Adventist SHTS	0.0	33.3	41.7	16.7	8.3
Kpone Community SHS	0.0	18.2	18.2	27.3	36.4
Kraboaa-Coaltar Presby SHTS	0.0	16.7	8.3	8.3	66.7
Krobo Community SHS	0.0	0.0	25.0	16.7	58.3
Kurofa Methodist SHS	0.0	0.0	0.0	8.3	91.7
Kwaobaah Nyanoa Community SHS	0.0	0.0	16.7	25.0	58.3
Langbinsi SHTS	0.0	0.0	0.0	0.0	100.0
Leklebi SHS	0.0	16.7	0.0	50.0	33.3
Mpaha Community SHS	0.0	0.0	0.0	8.3	91.7
Navrongo SHS	0.0	0.0	0.0	25.0	75.0
Nkrankwanta Community SHS	0.0	0.0	41.7	16.7	41.7
Northern Star SHS	0.0	0.0	0.0	0.0	100.0
Nuru-Ameen Islamic SHS	0.0	0.0	33.3	41.7	25.0
Nyinahin Catholic SHS	0.0	25.0	58.3	16.7	0.0
Onwe SHS	0.0	16.7	8.3	33.3	41.7
Opoku Agyeman SHTS	0.0	8.3	16.7	58.3	16.7
Prampram SHS	0.0	16.7	0.0	25.0	58.3
Sunyani S.D.A SHS	0.0	8.3	25.0	25.0	41.7
Sang Community Day SHS	0.0	0.0	0.0	0.0	100.0
Samuel Otu Presby SHS	0.0	41.7	25.0	8.3	25.0
Saviour SHS	0.0	8.3	50.0	25.0	16.7
Sawla SHS	0.0	0.0	0.0	25.0	75.0
Senya SHS	0.0	0.0	50.0	25.0	25.0
St. Augustine SHTS	0.0	0.0	0.0	16.7	83.3
St. Joseph SHS	0.0	0.0	25.0	50.0	25.0
St. Michael's SHS	0.0	16.7	25.0	16.7	41.7
Tamale SHS	0.0	16.7	16.7	41.7	25.0
Tanyigbe SHS	0.0	16.7	16.7	58.3	8.3
Taviefe Community SHS	0.0	8.3	25.0	41.7	25.0
Tawheed SHS	0.0	0.0	16.7	8.3	75.0

Name of school	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Terchire SHS	0.0	0.0	0.0	8.3	91.7
Tongo SHTS	0.0	0.0	16.7	33.3	50.0
Tuna SHTS	0.0	0.0	25.0	33.3	41.7
Uthman Bin Afam SHS	0.0	0.0	16.7	41.7	41.7
Ve Community SHS	0.0	0.0	16.7	25.0	58.3
Wapuli Community SHS	0.0	0.0	8.3	0.0	91.7
Worawora SHS	0.0	0.0	16.7	16.7	66.7
Yagaba SHS	0.0	0.0	0.0	16.7	83.3

Table A3.3 Item framework for reading proficiency by region

region	Text type				Aspects/cognitive processes			Situation		Cognitive demand		
	Description	Narration	Argumentative	Instruction	Access and retrieve	Integrate and interpret	Reflect and evaluate	Personal	Public	Low	Medium	High
Ahafo	48.3	25.0	25.0	37.5	47.9	32.7	36.9	38.5	43.6	48.5	32.7	27.1
Ashanti	56.9	27.9	26.9	39.7	54.6	48.8	38.2	46.9	50.5	54.7	45.6	39.9
Bono	61.1	31.0	32.7	42.9	60.6	50.0	42.7	49.4	55.7	60.9	46.3	44.0
Bono East	37.9	14.6	20.8	18.8	35.7	24.4	25.0	26.3	34.0	35.9	23.8	20.1
Central	63.3	34.6	32.7	51.9	61.8	55.4	46.4	53.3	57.4	63.0	50.9	44.5
Eastern	59.0	31.3	31.6	48.6	59.1	47.5	42.4	50.0	53.6	59.2	45.6	42.8
Greater Accra	53.9	27.6	27.6	43.1	50.9	45.3	35.7	38.6	49.1	50.9	40.6	39.7
North East	30.1	8.3	19.4	13.9	29.2	14.3	18.3	19.3	27.4	28.8	14.7	19.4
Northern	49.9	31.7	29.2	46.7	50.8	35.0	33.3	37.2	46.4	50.4	31.0	32.5
Oti	40.2	16.7	15.3	22.2	34.7	27.0	22.2	24.2	34.2	34.9	26.2	19.4
Savannah	39.5	19.4	12.5	13.9	37.8	25.4	14.3	28.3	33.0	37.3	24.2	14.4
Upper East	60.2	26.7	26.7	40.0	58.9	51.0	36.0	50.1	51.9	57.8	44.5	40.8
Upper West	37.7	8.3	12.5	10.4	32.4	23.5	17.0	23.4	29.5	31.3	19.3	13.9
Volta	53.7	29.9	29.0	39.3	51.8	44.7	36.2	40.4	48.6	52.1	38.6	36.3
Western	50.6	27.8	23.6	36.1	49.5	42.9	32.5	40.7	45.8	50.2	40.1	31.5
Western North	56.2	29.2	20.8	20.8	50.5	41.1	26.2	38.0	46.4	49.8	36.3	31.3

Table A3.4 Item framework for reading proficiency by school

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Adankwama n SHS	79.3	16.7	16.7	16.7	72.2	67.9	26.2	61.8	62.9	70.1	57.1	45.8
Adjen Kotoku SHS	44.0	16.7	16.7	25.0	38.2	25.0	17.9	18.1	39.0	36.7	19.0	29.2
Adugyama Community SHS	57.6	0.0	8.3	50.0	51.0	50.0	38.1	45.1	49.6	50.9	47.6	33.3
Afife SHTS	41.0	0.0	12.5	8.3	38.9	28.6	31.0	28.4	37.5	38.3	32.1	22.2
Agate Community SHS	62.9	41.7	41.7	50.0	61.8	56.0	46.4	52.9	56.4	63.9	48.8	41.7
Agotime SHS	54.8	50.0	37.5	66.7	56.6	46.4	48.8	39.7	55.3	57.7	35.7	37.5
Ahamansu Islamic SHS	37.9	8.3	8.3	25.0	33.0	25.0	17.9	23.0	31.1	32.7	23.8	13.9
Akokoaso SHTS	58.1	41.7	37.5	25.0	56.9	41.7	38.1	44.1	54.5	59.3	36.9	36.1
Amantin SHS	27.6	16.7	25.0	8.3	25.7	11.9	21.4	17.6	24.6	27.2	17.9	11.1
Anlo Awomefia SHS	70.2	41.7	41.7	58.3	72.9	53.6	59.5	60.3	65.5	75.0	50.0	62.5
Apeguso SHS	65.0	33.3	45.8	75.0	67.0	52.4	56.0	53.4	64.0	67.3	46.4	58.3

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Aperade SHTS	39.0	0.0	0.0	8.3	39.9	29.8	7.1	33.3	29.5	35.8	26.2	20.8
Awutu Bawjase Community SHS	77.4	66.7	62.5	83.3	77.8	70.2	71.4	71.1	74.2	81.2	64.3	70.8
Awutu Winton SHS	46.7	41.7	33.3	66.7	44.4	40.5	41.7	31.4	47.3	44.4	38.1	38.9
Ayanfuri SHS	51.2	41.7	41.7	50.0	48.3	44.0	29.8	35.8	47.7	48.1	32.1	31.9
Ayirebi SHS	68.6	25.0	20.8	41.7	60.8	61.9	35.7	57.4	53.4	61.4	56.0	43.1
Bassa Community SHS	35.2	8.3	16.7	8.3	32.6	17.9	20.2	20.1	31.8	32.1	14.3	11.1
Bimbilla SHS	42.4	16.7	29.2	33.3	45.1	17.9	29.8	28.4	43.2	43.8	17.9	27.8
Birifoh SHS	36.2	16.7	20.8	8.3	31.3	31.0	29.8	29.9	29.9	32.1	29.8	18.1
Bonzo-Kaku SHS	70.0	41.7	41.7	66.7	69.8	63.1	54.8	59.3	65.5	71.6	59.5	52.8
Boso SHTS	69.5	33.3	25.0	33.3	69.1	59.5	51.2	66.2	57.6	68.5	61.9	50.0
Bosomtwe Oyoko Community SHS	57.4	41.7	41.7	50.0	56.9	57.1	50.0	52.5	51.9	59.9	48.8	47.2
Brakwa SHTS	73.8	41.7	33.3	66.7	72.9	61.9	70.2	64.7	69.7	76.9	65.5	56.9

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Business SHS	71.4	58.3	62.5	100.0	78.1	54.8	70.2	62.3	75.0	79.3	51.2	66.7
Diamono SHS	48.6	25.0	25.0	8.3	45.5	25.0	25.0	33.8	40.5	45.1	21.4	22.2
Diaso SHS	66.7	33.3	37.5	66.7	68.1	59.5	56.0	62.7	61.4	71.3	54.8	43.1
Diaspora Girls' SHS	88.6	50.0	54.2	83.3	91.0	78.6	81.0	84.3	84.8	92.6	82.1	81.9
Ejisuman SHS	66.9	75.0	54.2	66.7	67.7	58.3	48.8	58.3	62.1	68.2	51.2	55.6
Esiamas SHTS	41.7	0.0	8.3	8.3	35.4	33.3	19.0	31.9	32.2	34.6	33.3	20.8
Han SHS	46.7	0.0	12.5	8.3	38.9	32.1	16.7	27.5	37.5	37.0	26.2	19.4
Ibadur Rahman Academy SHS	51.7	25.0	16.7	50.0	52.8	36.9	34.5	38.2	48.1	50.6	36.9	27.8
Jacobu SHTS	41.0	0.0	12.5	25.0	38.2	22.6	28.6	30.9	34.5	37.3	23.8	22.2
Jema SHS	50.0	16.7	25.0	41.7	49.0	25.0	36.9	35.3	47.7	48.1	27.4	38.9
Jukwa SHTS	59.3	33.3	33.3	58.3	59.7	59.5	50.0	54.4	55.3	61.1	54.8	47.2
Klo Agogo SHS	59.3	25.0	25.0	41.7	57.3	45.2	40.5	45.1	53.0	57.7	40.5	38.9
Kete Krachi SHTS	41.0	25.0	20.8	8.3	33.7	28.6	15.5	23.0	32.2	33.6	25.0	16.7
Kofiase Adventist SHTS	64.0	58.3	54.2	25.0	62.2	54.8	48.8	52.5	59.1	64.2	50.0	41.7

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Kpone Community SHS	49.6	36.4	31.8	45.5	48.1	49.4	36.4	41.7	45.0	47.8	45.5	37.9
Kraboaa- Coaltar Presby SHTS	45.2	25.0	20.8	41.7	46.2	33.3	29.8	33.3	43.2	45.4	33.3	23.6
Krobo Community SHS	38.6	16.7	16.7	16.7	35.4	42.9	21.4	32.4	31.8	36.1	35.7	19.4
Kurofa Methodist SHS	29.0	16.7	12.5	8.3	27.8	34.5	8.3	21.6	22.0	25.6	25.0	12.5
Kwahu Tafo SHS	91.4	50.0	45.8	91.7	91.0	79.8	76.2	85.8	82.6	90.4	84.5	79.2
Kwanwoma SHTS	55.5	16.7	25.0	33.3	50.7	47.6	31.0	37.3	49.2	49.1	44.0	34.7
Kwaobaah Nyanoa Community SHS	42.1	25.0	20.8	33.3	41.3	31.0	31.0	34.3	38.3	41.4	28.6	23.6
Langbinsi SHTS	23.1	0.0	8.3	8.3	20.5	9.5	11.9	13.7	18.9	21.0	11.9	12.5

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Lashibi Community Day SHS	61.0	36.4	36.4	36.4	61.4	55.8	29.9	44.9	55.8	60.3	46.8	37.9
Leklebi SHS	51.0	33.3	25.0	33.3	44.8	47.6	21.4	31.9	43.6	44.1	33.3	34.7
Maame Krobo Community SHS	42.9	8.3	16.7	33.3	40.3	36.9	22.6	33.8	34.5	38.9	33.3	25.0
Manso- Amenfi Community Day SHS	51.9	33.3	20.8	25.0	47.9	41.7	27.4	36.3	43.6	47.2	34.5	30.6
Moree Community SHS	69.8	25.0	33.3	41.7	70.5	53.6	47.6	58.3	61.7	69.8	51.2	50.0
Mpaha Community SHS	25.0	16.7	12.5	8.3	21.9	15.5	13.1	17.6	18.6	21.6	15.5	8.3
Navrongo SHS	45.5	0.0	0.0	8.3	41.3	32.1	1.2	31.4	29.2	37.7	19.0	11.1
Nkenkansu Community SHS	57.9	16.7	20.8	50.0	57.6	48.8	38.1	49.5	51.9	57.1	40.5	50.0

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Nkrankwanta Community SHS	47.1	16.7	20.8	25.0	47.2	31.0	38.1	36.8	43.9	46.3	34.5	29.2
Northern Star SHS	28.8	0.0	0.0	0.0	21.5	11.9	2.4	12.3	16.7	19.8	6.0	4.2
Notre Dame Girls SHS	90.0	66.7	45.8	100.0	92.4	84.5	81.0	82.8	85.6	94.8	85.7	83.3
Notre Dame Seminary SHS	90.7	75.0	66.7	91.7	95.5	85.7	83.3	82.4	89.4	97.2	84.5	80.6
Nuru-Ameen Islamic SHS	51.0	16.7	29.2	25.0	49.7	45.2	27.4	48.5	40.2	49.4	41.7	31.9
Nyinahin Catholic SHS	65.7	50.0	41.7	41.7	65.6	60.7	47.6	51.5	64.8	66.7	53.6	41.7
O.L.L. Girls SHS	63.8	41.7	41.7	58.3	63.5	59.5	57.1	60.3	58.7	65.7	60.7	51.4
Odoben SHS	65.7	16.7	20.8	33.3	62.2	70.2	45.2	62.3	56.4	63.6	65.5	40.3
Ogyedom Community SHTS	53.8	23.1	26.9	46.2	54.5	45.1	38.5	49.3	45.5	55.6	37.4	34.6
Onwe SHS	49.8	16.7	20.8	41.7	43.4	34.5	29.8	30.4	47.0	44.8	36.9	36.1

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Opoku Agyeman SHTS	53.3	50.0	41.7	33.3	50.0	41.7	39.3	38.2	50.4	50.9	38.1	37.5
Osei Adutwum SHS	72.4	58.3	50.0	83.3	71.9	63.1	65.5	61.3	69.7	74.4	59.5	66.7
Our Lady of Providence SHS	65.0	33.3	37.5	66.7	64.2	50.0	45.2	47.1	61.7	63.9	47.6	50.0
Kwamang Presbyterian SHTS	61.9	50.0	58.3	75.0	67.7	50.0	52.4	53.9	63.3	70.4	45.2	52.8
Prampram SHS	46.2	25.0	25.0	41.7	43.4	35.7	31.0	30.9	42.0	42.6	33.3	27.8
Mampong Presbyterian SHS	80.7	7.7	15.4	38.5	76.9	72.5	56.0	79.2	67.5	75.8	76.9	66.7
Prince of Peace Girls SHS	75.0	8.3	12.5	58.3	70.8	70.2	63.1	73.0	63.6	71.0	72.6	61.1
Sunyani S.D.A SHS	51.0	8.3	16.7	16.7	49.3	39.3	31.0	38.7	45.5	49.1	34.5	29.2

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Sang Community Day SHS	27.6	0.0	0.0	0.0	21.2	7.1	8.3	11.8	18.6	19.8	8.3	6.9
Samuel Otu Presby SHS	59.8	41.7	41.7	66.7	61.5	44.0	51.2	48.0	58.0	63.3	42.9	40.3
Saviour SHS	53.1	41.7	41.7	58.3	54.2	36.9	45.2	41.2	51.5	54.6	35.7	37.5
Sawla SHS	47.4	8.3	8.3	8.3	45.1	19.0	13.1	32.8	37.1	43.5	21.4	13.9
Senya SHS	53.1	41.7	20.8	41.7	50.3	38.1	34.5	35.3	50.0	51.5	40.5	30.6
St. Stephen's Presby SHTS	50.4	36.4	36.4	45.5	54.2	37.7	35.1	39.0	50.8	54.2	36.4	37.9
St. Ann's Girls SHS	66.2	50.0	62.5	41.7	68.8	70.2	45.2	58.3	62.5	70.7	57.1	52.8
St. Augustine SHTS	39.0	16.7	16.7	25.0	37.8	19.0	19.0	24.0	34.1	36.1	15.5	13.9
St. Charles SHS	70.5	41.7	41.7	66.7	76.7	54.8	46.4	52.5	69.7	75.3	46.4	48.6
St. John's Integrated SHTS	53.8	8.3	12.5	25.0	48.3	38.1	15.5	37.3	42.8	45.7	27.4	34.7
St. Joseph SHS	60.5	25.0	20.8	16.7	53.1	40.5	25.0	39.7	49.2	52.5	38.1	31.9
St. Michael's SHS	41.2	16.7	8.3	0.0	33.7	44.0	3.6	28.4	28.0	32.4	32.1	18.1

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Nkawkaw St. Michael's SHS	49.3	25.0	25.0	41.7	49.3	36.9	33.3	44.1	42.4	50.0	35.7	33.3
Tamale SHS	51.0	50.0	37.5	50.0	53.1	44.0	33.3	42.6	47.3	53.4	36.9	33.3
Tanyigbe SHS	54.8	41.7	41.7	41.7	54.9	50.0	39.3	44.6	51.9	55.9	45.2	45.8
Taviefe Community SHS	52.1	25.0	20.8	41.7	48.6	44.0	35.7	40.7	47.7	49.7	41.7	31.9
Tawheed SHS	36.7	25.0	20.8	16.7	33.0	23.8	16.7	23.0	31.4	32.4	21.4	19.4
Tema Manhean SHTS	69.0	25.0	29.2	66.7	63.9	61.9	63.1	58.3	64.0	67.6	59.5	65.3
Terchire SHS	36.9	8.3	8.3	8.3	34.4	21.4	22.6	28.9	29.2	33.6	22.6	13.9
Tijjaniya SHS	73.3	33.3	25.0	58.3	76.4	58.3	50.0	68.6	67.8	76.5	63.1	51.4
Tongo SHTS	47.4	8.3	12.5	16.7	45.8	39.3	22.6	39.2	39.4	42.9	31.0	26.4
Tongor SHTS	53.2	18.2	22.7	36.4	45.8	40.3	26.0	32.6	43.8	44.4	29.9	39.4
Tuna SHTS	46.2	33.3	16.7	25.0	46.5	41.7	16.7	34.3	43.2	46.9	35.7	20.8
Uthman Bin Afam SHS	40.0	41.7	20.8	33.3	43.4	32.1	23.8	30.9	39.8	44.4	27.4	20.8
Ve Community SHS	43.1	16.7	16.7	16.7	41.0	35.7	16.7	31.9	35.2	38.9	29.8	11.1

	Text type				Aspects/cognitive processes			Situation			Cognitive demand	
	<i>Descriptio n</i>	<i>Narratio n</i>	<i>Argumentativ e</i>	<i>Instructio n</i>	<i>Access and retriev e</i>	<i>Integrat e and interpret</i>	<i>Reflect and evaluat e</i>	Persona l	Publi c	<i>Low</i>	<i>Mediu m</i>	<i>High</i>
Wapuli Community SHS	28.8	8.3	4.2	16.7	24.7	14.3	8.3	16.7	21.6	24.1	11.9	6.9
Worawora SHS	41.9	16.7	16.7	33.3	37.5	27.4	33.3	26.5	39.4	38.3	29.8	27.8
Yagaba SHS	24.8	8.3	20.8	0.0	21.9	15.5	13.1	15.7	20.1	21.6	14.3	18.1
St Augustine SHS	60.0	16.7	20.8	41.7	56.9	50.0	33.3	48.0	50.4	56.5	42.9	41.7

Table A3.5 Proficiency in mathematics by region (%)

Region	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Ahafo	0.0	0.0	8.3	25.0	66.7
Ashanti	0.0	3.1	11.4	29.8	55.7
Bono	4.8	4.8	21.4	31.0	38.1
Bono East	2.0	2.0	4.0	30.0	62.0
Central	3.0	6.8	17.4	36.4	36.4
Eastern	2.2	8.3	15.0	29.4	45.0
Greater Accra	0.0	1.7	3.3	33.3	61.7
North East	0.0	0.0	5.6	11.1	83.3
Northern	6.7	6.7	16.7	25.0	45.0
Oti	2.8	2.8	19.4	30.6	44.4
Savannah	0.0	0.0	8.3	33.3	58.3
Upper East	18.3	3.3	3.3	21.7	53.3
Upper West	0.0	0.0	4.2	27.1	68.8
Volta	0.0	3.7	14.8	33.3	48.2
Western	2.8	2.8	8.3	30.6	55.6
Western North	4.2	0.0	8.3	33.3	54.2

Table A3.6 Proficiency in mathematics by school (%)

Name of school	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Notre Dame Seminary SHS	83.3	16.7	0.0	0.0	0.0
Notre Dame Girls SHS	25.0	16.7	41.7	16.7	0.0
Odoben SHS	25.0	8.3	0.0	16.7	50.0
St. Charles SHS	25.0	25.0	25.0	25.0	0.0
Mampong Presbyterian SHS	16.7	8.3	16.7	16.7	41.7
Akokoaso SHTS	8.3	16.7	16.7	41.7	16.7
Moree Community SHS	8.3	0.0	58.3	25.0	8.3
Navrongo SHS	8.3	0.0	8.3	25.0	58.3
Our Lady of Providence SHS	8.3	0.0	16.7	25.0	50.0
Saviour SHS	8.3	8.3	16.7	16.7	50.0
St. Joseph SHS	8.3	0.0	0.0	25.0	66.7
Tamale SHS	8.3	8.3	8.3	33.3	41.7

Name of school	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Uthman Bin Afam SHS	8.3	8.3	25.0	8.3	50.0
Worawora SHS	8.3	8.3	50.0	8.3	25.0
Jema SHS	7.1	0.0	14.3	35.7	42.9
Adankwaman SHS	0.0	8.3	25.0	58.3	8.3
Adjen Kotoku SHS	0.0	0.0	8.3	33.3	58.3
Adugyama Community SHS	0.0	0.0	16.7	41.7	41.7
Afife SHTS	0.0	0.0	0.0	8.3	91.7
Agate Community SHS	0.0	8.3	0.0	0.0	91.7
Agotime SHS	0.0	8.3	8.3	58.3	25.0
Ahamansu Islamic SHS	0.0	0.0	0.0	16.7	83.3
Amantin SHS	0.0	0.0	0.0	16.7	83.3
Anlo Awomefia SHS	0.0	8.3	16.7	25.0	50.0
Apeguso SHS	0.0	0.0	16.7	25.0	58.3
Aperade SHTS	0.0	0.0	0.0	33.3	66.7
Awutu Bawjiase Community SHS	0.0	16.7	16.7	50.0	16.7
Awutu Winton SHS	0.0	8.3	8.3	33.3	50.0
Ayanfuri SHS	0.0	0.0	0.0	25.0	75.0
Ayirebi SHS	0.0	25.0	8.3	33.3	33.3
Bassa Community SHS	0.0	8.3	0.0	41.7	50.0
Bimbilla SHS	0.0	0.0	16.7	25.0	58.3
Birifoh SHS	0.0	0.0	0.0	33.3	66.7
Bonzo-Kaku SHS	0.0	0.0	0.0	58.3	41.7
Boso SHTS	0.0	16.7	33.3	8.3	41.7
Bosomtwe Oyoko Community SHS	0.0	0.0	0.0	41.7	58.3
Brakwa SHTS	0.0	16.7	16.7	50.0	16.7
Business SHS	0.0	0.0	33.3	41.7	25.0
Diamono SHS	0.0	8.3	33.3	33.3	25.0
Diaso SHS	0.0	16.7	58.3	25.0	0.0
Diaspora Girls' SHS	0.0	16.7	33.3	41.7	8.3
Ejisuman SHS	0.0	8.3	16.7	33.3	41.7
Esiama SHTS	0.0	0.0	0.0	25.0	75.0
Han SHS	0.0	0.0	0.0	25.0	75.0
Ibadur Rahman Academy SHS	0.0	0.0	25.0	41.7	33.3
Jacobu SHTS	0.0	0.0	8.3	25.0	66.7

Name of school	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Jukwa SHTS	0.0	0.0	0.0	41.7	58.3
Klo Agogo SHS	0.0	8.3	0.0	41.7	50.0
Kete Krachi SHTS	0.0	0.0	8.3	66.7	25.0
Kofiase Adventist SHTS	0.0	25.0	33.3	25.0	16.7
Kpone Community SHS	0.0	0.0	0.0	41.7	58.3
Kraboaa-Coaltar Presby SHTS	0.0	8.3	8.3	33.3	50.0
Krobo Community SHS	0.0	0.0	0.0	25.0	75.0
Kurofa Methodist SHS	0.0	0.0	0.0	0.0	100.0
Kwahu Tafo SHS	0.0	16.7	66.7	16.7	0.0
Kwanwoma SHTS	0.0	8.3	0.0	33.3	58.3
Kwaobaah Nyanoa Community SHS	0.0	0.0	0.0	25.0	75.0
Langbinsi SHTS	0.0	0.0	0.0	8.3	91.7
Lashibi Community Day SHS	0.0	0.0	0.0	33.3	66.7
Leklebi SHS	0.0	0.0	8.3	41.7	50.0
Maame Krobo Community SHS	0.0	0.0	8.3	58.3	33.3
Manso-Amenfi Community Day SHS	0.0	0.0	16.7	41.7	41.7
Mpaha Community SHS	0.0	0.0	0.0	8.3	91.7
Nkenkansu Community SHS	0.0	0.0	0.0	8.3	91.7
Nkrankwanta Community SHS	0.0	8.3	0.0	25.0	66.7
Northern Star SHS	0.0	0.0	0.0	16.7	83.3
Nuru-Ameen Islamic SHS	0.0	0.0	8.3	25.0	66.7
Nyinahin Catholic SHS	0.0	0.0	8.3	50.0	41.7
O.L.L. Girls SHS	0.0	0.0	0.0	16.7	83.3
Ogyedom Community SHTS	0.0	0.0	8.3	16.7	75.0
Onwe SHS	0.0	0.0	8.3	33.3	58.3
Opoku Agyeman SHTS	0.0	0.0	0.0	16.7	83.3
Osei Adutwum SHS	0.0	16.7	8.3	33.3	41.7
Prampram SHS	0.0	0.0	0.0	8.3	91.7

Name of school	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Kwamang Presbyterian SHTS	0.0	0.0	33.3	41.7	25.0
Prince of Peace Girls SHS	0.0	0.0	50.0	25.0	25.0
Sunyani S.D.A SHS	0.0	0.0	8.3	8.3	83.3
Sang Community Day SHS	0.0	0.0	0.0	25.0	75.0
Samuel Otu Presby SHS	0.0	0.0	16.7	41.7	41.7
Sawla SHS	0.0	0.0	0.0	41.7	58.3
Senya SHS	0.0	0.0	0.0	58.3	41.7
St. Stephen's Presby SHTS	0.0	0.0	0.0	33.3	66.7
St. Ann's Girls SHS	0.0	0.0	50.0	50.0	0.0
St. Augustine SHTS	0.0	0.0	16.7	33.3	50.0
St. John's Integrated SHTS	0.0	0.0	8.3	41.7	50.0
St. Michael's SHS	0.0	0.0	0.0	25.0	75.0
Nkawkaw St. Michael's SHS	0.0	0.0	0.0	16.7	83.3
Tanyigbe SHS	0.0	0.0	16.7	33.3	50.0
Taviefe Community SHS	0.0	0.0	25.0	50.0	25.0
Tawheed SHS	0.0	0.0	0.0	16.7	83.3
Tema Manhean SHTS	0.0	8.3	8.3	50.0	33.3
Terchire SHS	0.0	0.0	0.0	8.3	91.7
Tijjaniya SHS	0.0	0.0	0.0	50.0	50.0
Tongo SHTS	0.0	0.0	0.0	25.0	75.0
Tongor SHTS	0.0	0.0	16.7	41.7	41.7
Tuna SHTS	0.0	0.0	25.0	50.0	25.0
Ve Community SHS	0.0	8.3	41.7	41.7	8.3
Wapuli Community SHS	0.0	0.0	16.7	0.0	83.3
Yagaba SHS	0.0	0.0	0.0	0.0	100.0
St Augustine SHS	0.0	0.0	0.0	58.3	41.7

Table A3.7 Item framework of mathematical literacy assessment by region

Region	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
Ahafo	31.0	40.8	33.3	41.4	30.1	27.8	49.8	48.3	22.2	24.6
Ashanti	35.0	44.4	49.8	45.4	33.6	32.3	50.5	51.4	29.2	27.1
Bono	44.4	44.8	51.2	49.7	40.8	42.1	57.7	61.5	33.9	29.8
Bono East	30.7	37.4	40.0	41.6	31.7	26.6	48.1	49.1	25.7	23.4
Central	41.0	51.4	48.1	48.1	40.1	38.4	54.8	58.4	33.1	32.2
Eastern	37.4	47.8	49.2	46.0	38.2	34.3	51.1	53.6	32.4	31.9
Greater Accra	32.2	41.8	44.2	41.9	30.9	27.9	49.1	49.5	29.7	23.0
North East	29.5	37.2	37.5	36.6	28.0	24.0	43.5	44.1	25.9	22.2
Northern	37.4	51.7	54.2	47.0	41.5	36.3	51.7	54.8	33.0	34.8
Oti	34.8	37.5	58.3	46.9	37.6	32.8	52.1	52.7	28.9	30.8
Savannah	24.4	53.6	37.5	43.4	35.7	31.7	48.1	48.3	22.8	29.4
Upper East	39.0	52.3	52.5	51.5	41.9	35.0	58.3	58.6	34.6	35.8
Upper West	27.3	42.7	46.9	42.1	33.7	25.0	51.2	48.3	21.9	26.9
Volta	35.0	43.5	47.2	46.7	36.8	31.8	53.8	54.1	29.8	27.9
Western	28.4	50.3	45.8	48.1	37.2	30.8	51.0	48.9	28.3	29.4
Western North	40.4	43.3	58.3	43.3	33.3	32.4	52.8	58.5	28.6	24.6

Table A3.8 Item framework of mathematical literacy assessment by school

	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
Adankwaman SHS	45.4	53.3	45.8	52.3	39.7	39.6	62.7	60.8	38.9	33.3
Adjen Kotoku SHS	29.9	50.0	33.3	46.8	32.1	29.4	48.8	46.9	30.0	27.5
Adugyama Community SHS	36.4	46.7	62.5	46.3	32.7	39.1	44.8	47.8	33.3	30.0
Afife SHTS	28.7	45.8	16.7	35.2	25.6	21.5	46.3	42.5	20.6	23.3
Agate Community SHS	28.4	34.2	54.2	40.3	30.8	22.0	49.1	48.1	21.1	26.7
Agotime SHS	43.5	43.3	62.5	51.4	42.9	36.1	60.2	58.3	35.6	38.3
Ahamansu Islamic SHS	25.6	28.3	50.0	40.3	28.2	24.1	43.8	42.2	20.6	22.5
Akokoaso SHTS	42.6	67.5	70.8	54.2	54.5	50.0	56.8	60.0	37.8	47.5
Amantin SHS	21.3	40.0	25.0	34.7	28.8	20.8	41.4	39.2	20.0	19.2
Anlo Awomefia SHS	40.4	49.2	45.8	49.5	41.7	36.6	58.6	58.9	33.9	23.3
Apeguso SHS	30.2	49.2	41.7	42.1	29.5	27.5	44.8	44.7	27.8	25.8
Aperade SHTS	33.0	39.2	50.0	35.6	30.1	19.2	38.6	36.4	33.3	29.2

	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
Awutu Bawjiase Community SHS	43.5	55.0	75.0	56.5	44.9	47.2	54.9	60.8	42.2	34.2
Awutu Winton SHS	36.1	47.5	37.5	47.7	30.8	33.3	44.8	48.3	33.9	22.5
Ayanfuri SHS	25.9	37.5	8.3	43.5	28.8	25.7	50.6	53.3	20.6	21.7
Ayirebi SHS	49.4	46.7	62.5	44.9	42.3	41.2	51.9	55.3	37.8	37.5
Bassa Community SHS	29.9	33.3	45.8	51.9	38.5	32.9	57.1	58.6	27.8	20.0
Bimbilla SHS	40.7	37.5	50.0	46.8	37.8	34.7	52.2	57.5	31.1	25.0
Birifoh SHS	28.4	54.2	45.8	39.4	38.5	35.9	47.8	51.4	18.3	28.3
Bonzo-Kaku SHS	22.8	45.0	45.8	49.1	34.0	27.5	49.7	50.6	27.2	25.8
Boso SHTS	50.3	52.5	54.2	48.6	33.3	37.7	50.9	52.8	39.4	32.5
Bosomtwe Oyoko Community SHS	28.4	45.8	41.7	40.3	35.3	31.0	47.2	48.9	24.4	22.5
Brakwa SHTS	48.8	39.2	79.2	58.3	46.8	46.3	65.1	67.2	30.0	45.8
Business SHS	45.4	40.0	66.7	49.1	45.5	38.9	57.1	61.7	29.4	35.0
Diamono SHS	51.9	49.2	29.2	47.2	37.2	45.8	50.3	59.2	39.4	30.8
Diaso SHS	52.5	76.7	54.2	53.7	56.4	56.0	58.6	67.2	40.0	45.8
Diaspora Girls' SHS	53.7	42.5	70.8	54.6	49.4	44.4	68.5	67.5	43.9	34.2
Ejisuman SHS	42.9	50.0	62.5	49.1	35.3	34.3	52.8	58.6	32.8	30.0
Esiamas SHTS	21.9	40.0	45.8	38.9	31.4	24.1	45.4	38.9	21.1	25.8

	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
Han SHS	18.8	41.7	54.2	42.1	33.3	16.2	54.9	46.9	21.1	25.8
Ibadur Rahman Academy SHS	39.8	48.3	54.2	54.6	38.5	41.7	57.7	59.2	35.0	22.5
Jacobu SHTS	32.4	45.8	41.7	45.4	32.7	27.1	51.9	50.8	25.0	30.0
Jema SHS	40.2	45.0	46.4	44.0	34.6	28.4	52.4	57.6	29.0	32.9
Jukwa SHTS	32.1	43.3	54.2	39.8	30.1	28.2	51.2	48.1	27.2	27.5
Klo Agogo SHS	31.2	48.3	37.5	46.3	33.3	29.6	49.1	54.7	24.4	29.2
Kete Krachi SHTS	33.3	35.8	54.2	44.4	32.1	38.9	48.1	50.0	27.8	29.2
Kofiase Adventist SHTS	52.8	53.3	79.2	60.2	46.2	49.3	63.9	64.2	43.9	40.8
Kpone Community SHS	37.7	30.8	37.5	40.3	23.7	26.2	42.6	49.7	34.4	18.3
Kraboa-Coaltar Presby SHTS	32.1	49.2	37.5	45.4	31.4	28.2	48.8	52.2	27.8	30.0
Krobo Community SHS	29.9	30.0	41.7	35.2	24.4	23.8	40.7	39.4	25.6	20.0
Kurofa Methodist SHS	17.3	31.7	50.0	37.0	26.3	22.7	41.4	35.6	24.4	15.0
Kwahu Tafo SHS	60.8	46.7	70.8	60.2	54.5	56.0	68.8	76.4	47.8	37.5
Kwanwoma SHTS	32.7	37.5	50.0	48.1	37.2	25.9	54.3	52.8	29.4	27.5

	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
Kwaobaah Nyanoa Community SHS	25.9	43.3	33.3	31.9	32.1	19.4	41.4	47.5	23.3	25.8
Langbinsi SHTS	26.9	39.2	33.3	29.6	22.4	20.1	35.8	36.7	25.6	20.8
Lashibi Community Day SHS	31.5	34.2	50.0	38.4	31.4	21.5	50.9	52.5	24.4	21.7
Leklebi SHS	25.6	45.0	37.5	41.2	33.3	24.8	50.6	55.6	22.8	22.5
Maame Krobo Community SHS	27.8	55.8	33.3	38.4	41.0	31.3	47.8	50.0	24.4	33.3
Manso-Amenfi Community Day SHS	48.5	45.8	45.8	43.5	25.0	37.0	48.8	55.3	28.9	29.2
Moree Community SHS	63.3	60.8	45.8	52.8	47.4	59.3	58.6	70.3	47.8	33.3
Mpaha Community SHS	21.3	36.7	20.8	31.0	24.4	23.6	34.9	42.5	15.6	23.3
Navrongo SHS	34.0	47.5	41.7	46.8	33.3	28.2	54.0	50.6	29.4	32.5
Nkenkansu Community SHS	22.2	53.3	41.7	27.8	30.1	20.8	38.9	40.0	20.6	27.5
Nkrankwanta Community SHS	32.7	30.8	41.7	45.4	29.5	28.0	54.0	56.9	18.3	24.2

	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
Northern Star SHS	28.1	37.5	16.7	32.9	22.4	19.7	39.2	32.8	23.3	23.3
Notre Dame Girls SHS	53.1	75.0	87.5	69.0	65.4	66.2	67.0	66.1	58.3	61.7
Notre Dame Seminary SHS	79.9	103.3	95.8	79.2	75.0	83.6	72.8	81.1	80.6	75.0
Nuru-Ameen Islamic SHS	39.2	50.8	37.5	40.3	32.1	35.0	43.5	46.9	30.0	32.5
Nyinahin Catholic SHS	40.7	30.8	50.0	48.1	37.2	31.9	59.6	63.3	23.3	25.8
O.L.L. Girls SHS	25.0	42.5	33.3	39.8	35.3	21.5	52.2	53.3	18.9	22.5
Odoben SHS	46.0	60.8	33.3	51.9	46.2	45.6	58.0	61.4	36.1	39.2
Ogyeedom Community SHTS	29.3	45.0	45.8	31.9	30.8	20.6	42.6	48.1	22.8	25.0
Onwe SHS	29.9	30.0	45.8	50.0	34.6	31.5	56.5	57.8	25.0	18.3
Opoku Agyeman SHTS	16.7	52.5	20.8	44.9	28.2	23.6	47.2	35.0	23.3	26.7
Osei Adutwum SHS	43.5	45.8	66.7	43.5	35.9	30.6	48.8	54.2	37.8	24.2
Our Lady of Providence SHS	46.0	40.8	58.3	51.9	39.1	41.4	58.3	63.1	33.3	30.8

	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
Kwamang Presbyterian SHTS	44.8	60.8	70.8	50.0	48.7	42.6	56.5	61.9	37.2	39.2
Prampram SHS	25.6	43.3	29.2	34.3	23.7	19.2	45.7	43.9	20.6	18.3
Mampong Presbyterian SHS	56.5	52.5	58.3	49.5	32.7	52.1	54.3	61.7	39.4	35.0
Prince of Peace Girls SHS	57.4	53.3	58.3	52.8	36.5	48.6	56.2	60.8	38.9	39.2
Sunyani S.D.A SHS	27.5	40.8	33.3	36.6	32.7	28.2	47.8	47.2	23.3	21.7
Sang Community Day SHS	16.7	50.0	33.3	33.8	28.8	21.5	39.5	35.8	17.8	23.3
Samuel Otu Presby SHS	34.6	43.3	50.0	45.8	34.0	35.0	49.7	49.4	30.0	24.2
Saviour SHS	37.7	42.5	54.2	52.3	40.4	34.5	53.1	54.7	31.7	35.8
Sawla SHS	26.5	55.0	41.7	47.7	32.1	29.6	54.3	54.7	22.8	23.3
Senya SHS	28.4	45.8	50.0	40.7	39.1	20.6	55.9	56.4	25.0	25.8
St. Stephen's Presby SHTS	18.5	38.3	37.5	43.5	30.8	25.7	46.0	47.5	27.8	21.7
St. Ann's Girls SHS	57.7	43.3	50.0	50.9	45.5	50.9	68.8	76.9	37.8	20.0

	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
St. Augustine SHTS	34.0	37.5	70.8	54.2	40.4	28.2	62.7	62.2	25.0	30.0
St. Charles SHS	59.9	73.3	83.3	63.0	57.1	60.2	62.0	73.9	58.9	49.2
St. John's Integrated SHTS	29.6	33.3	54.2	49.5	34.0	22.2	61.1	60.8	21.7	24.2
St. Joseph SHS	32.4	40.8	70.8	43.1	41.7	27.8	56.8	61.7	28.3	20.0
St. Michael's SHS	25.0	40.8	33.3	42.6	28.2	22.9	47.2	40.8	24.4	21.7
Nkawkaw St. Michael's SHS	23.1	34.2	12.5	42.1	21.8	27.1	43.8	42.5	22.2	20.0
Tamale SHS	36.4	54.2	54.2	48.1	42.9	39.1	51.2	56.1	32.8	37.5
Tanyigbe SHS	30.9	36.7	58.3	47.7	32.1	30.8	50.6	53.6	30.0	24.2
Taviefe Community SHS	38.0	45.0	41.7	48.1	40.4	36.1	52.8	52.5	37.8	26.7
Tawheed SHS	24.7	39.2	50.0	35.6	23.7	22.0	38.9	43.1	20.6	21.7
Tema Manhean SHTS	36.4	50.8	70.8	49.5	43.6	43.3	57.7	54.4	38.9	29.2
Terchire SHS	27.5	38.3	16.7	37.0	26.3	20.6	50.0	47.2	14.4	25.0
Tijjaniya SHS	26.9	35.8	41.7	45.8	35.3	24.3	54.6	55.8	22.8	25.0
Tongo SHTS	26.5	35.0	37.5	42.1	32.1	19.2	51.2	47.2	22.2	25.0
Tongor SHTS	25.6	41.7	50.0	47.7	37.8	28.9	55.2	55.6	25.6	26.7
Tuna SHTS	25.3	69.2	50.0	51.4	50.6	41.9	55.2	47.8	30.0	41.7
Uthman Bin Afam SHS	40.4	65.8	45.8	56.5	46.2	40.7	58.0	57.2	36.7	36.7

	Quantity	Space and shape	Change and relationship	Uncertainty and data	Formulating situations mathematically	Employing mathematical concepts, facts, procedures, and reasoning	Interpreting, applying, and evaluating mathematical outcomes	Low	Medium	High
Ve Community SHS	53.7	50.8	58.3	59.3	46.2	49.3	60.8	61.7	40.6	39.2
Wapuli Community SHS	28.7	40.8	33.3	41.2	33.3	21.5	48.5	46.7	26.1	29.2
Worawora SHS	45.4	48.3	70.8	56.0	52.6	35.4	64.2	65.8	38.3	40.8
Yagaba SHS	21.0	35.0	29.2	33.3	23.7	17.1	42.6	38.1	21.1	20.8
St Augustine SHS	41.7	33.3	58.3	47.2	35.9	34.0	57.4	60.8	26.7	19.2

Table A3.9 Proficiency in science literacy by region (%)

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Ahafo	0.0	16.7	8.3	29.2	45.8
Ashanti	3.1	15.0	30.0	32.6	19.4
Bono	8.3	16.7	33.3	31.0	10.7
Bono East	4.2	4.2	22.9	33.3	35.4
Central	3.8	20.5	28.0	28.0	19.7

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Eastern	5.0	15.6	33.3	28.9	17.2
Greater Accra	3.3	30.0	35.0	18.3	13.3
North East	0.0	0.0	17.1	22.9	60.0
Northern	16.7	16.7	20.0	6.7	40.0
Oti	0.0	5.6	25.0	30.6	38.9
Savannah	0.0	2.8	19.4	38.9	38.9
Upper East	15.0	11.7	21.7	26.7	25.0
Upper West	0.0	10.4	25.0	27.1	37.5
Volta	3.7	18.4	43.1	18.4	16.5
Western	2.8	22.2	36.1	36.1	2.8
Western North	8.3	16.7	33.3	29.2	12.5

Table A3.10 Proficiency in science literacy by school

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Adankwaman SHS	0.0	16.7	41.7	41.7	0.0
Adjen Kotoku SHS	0.0	41.7	41.7	16.7	0.0
Adugyama Community SHS	16.7	16.7	50.0	16.7	0.0
Afife SHTS	0.0	8.3	25.0	33.3	33.3

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Agate Community SHS	0.0	25.0	58.3	8.3	8.3
Agotime SHS	16.7	25.0	41.7	0.0	16.7
Ahamansu Islamic SHS	0.0	0.0	8.3	25.0	66.7
Akokoaso SHTS	0.0	8.3	41.7	41.7	8.3
Amantin SHS	0.0	0.0	0.0	16.7	83.3
Anlo Awomefia SHS	8.3	33.3	41.7	16.7	0.0
Apeguso SHS	0.0	25.0	50.0	16.7	8.3
Aperade SHTS	0.0	16.7	33.3	33.3	16.7
Awutu Bawjiase Community SHS	8.3	16.7	41.7	33.3	0.0
Awutu Winton SHS	0.0	16.7	16.7	25.0	41.7
Ayanfuri SHS	0.0	8.3	25.0	33.3	33.3
Ayirebi SHS	8.3	33.3	41.7	8.3	8.3
Bassa Community SHS	0.0	0.0	25.0	50.0	25.0
Bimbilla SHS	0.0	0.0	36.4	36.4	27.3
Birifoh SHS	0.0	0.0	16.7	41.7	41.7
Bonzo-Kaku SHS	0.0	25.0	33.3	33.3	8.3
Boso SHTS	0.0	8.3	33.3	33.3	25.0
Bosomtwe Oyoko Community SHS	0.0	0.0	25.0	66.7	8.3
Brakwa SHTS	8.3	50.0	41.7	0.0	0.0
Business SHS	16.7	16.7	25.0	16.7	25.0

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Diamono SHS	0.0	8.3	33.3	41.7	16.7
Diaso SHS	8.3	50.0	16.7	25.0	0.0
Diaspora Girls' SHS	33.3	33.3	25.0	8.3	0.0
Ejisuman SHS	0.0	33.3	8.3	41.7	16.7
Esiamas SHTS	0.0	8.3	58.3	33.3	0.0
Han SHS	0.0	8.3	16.7	41.7	33.3
Ibadur Rahman Academy SHS	0.0	0.0	50.0	41.7	8.3
Jacobu SHTS	16.7	0.0	16.7	33.3	33.3
Jema SHS	8.3	0.0	33.3	41.7	16.7
Jukwa SHTS	8.3	8.3	8.3	50.0	25.0
Klo Agogo SHS	0.0	25.0	33.3	25.0	16.7
Kete Krachi SHTS	0.0	16.7	41.7	25.0	16.7
Kofiase Adventist SHTS	8.3	16.7	50.0	8.3	16.7
Kpone Community SHS	0.0	33.3	41.7	16.7	8.3
Kraboaa-Coaltar Presby SHTS	0.0	16.7	25.0	33.3	25.0
Krobo Community SHS	8.3	16.7	33.3	25.0	16.7
Kurofa Methodist SHS	0.0	0.0	8.3	33.3	58.3
Kwahu Tafo SHS	16.7	25.0	41.7	16.7	0.0
Kwanwoma SHTS	0.0	8.3	33.3	50.0	8.3

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Kwaobaah Nyanoa Community SHS	0.0	16.7	16.7	25.0	41.7
Langbinsi SHTS	0.0	0.0	8.3	8.3	83.3
Lashibi Community Day SHS	0.0	33.3	50.0	8.3	8.3
Leklebi SHS	0.0	33.3	41.7	25.0	0.0
Maame Krobo Community SHS	0.0	0.0	8.3	50.0	41.7
Manso-Amenfi Community Day SHS	0.0	16.7	33.3	33.3	16.7
Moree Community SHS	0.0	25.0	58.3	16.7	0.0
Mpaha Community SHS	0.0	0.0	0.0	25.0	75.0
Navrongo SHS	0.0	0.0	16.7	58.3	25.0
Nkenkansu Community SHS	0.0	8.3	8.3	33.3	50.0
Nkrankwanta Community SHS	0.0	25.0	25.0	33.3	16.7
Northern Star SHS	0.0	8.3	8.3	8.3	75.0
Notre Dame Girls SHS	41.7	33.3	25.0	0.0	0.0
Notre Dame Seminary SHS	75.0	16.7	0.0	8.3	0.0
Nuru-Ameen Islamic SHS	8.3	8.3	33.3	41.7	8.3

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Nyinahin Catholic SHS	0.0	83.3	16.7	0.0	0.0
O.L.L. Girls SHS	0.0	25.0	50.0	8.3	16.7
Odoben SHS	0.0	25.0	0.0	33.3	41.7
Ogyeedom Community SHTS	0.0	8.3	8.3	16.7	66.7
Onwe SHS	0.0	8.3	58.3	25.0	8.3
Opoku Agyeman SHTS	0.0	0.0	0.0	33.3	66.7
Osei Adutwum SHS	0.0	41.7	33.3	16.7	8.3
Our Lady of Providence SHS	8.3	33.3	33.3	25.0	0.0
Kwamang Presbyterian SHTS	16.7	8.3	33.3	25.0	16.7
Prampram SHS	8.3	16.7	16.7	16.7	41.7
Mampong Presbyterian SHS	0.0	27.3	72.7	0.0	0.0
Prince of Peace Girls SHS	0.0	8.3	25.0	58.3	8.3
Sunyani S.D.A SHS	8.3	8.3	16.7	41.7	25.0
Sang Community Day SHS	0.0	0.0	0.0	0.0	100.0
Samuel Otu Presby SHS	0.0	33.3	16.7	33.3	16.7
Saviour SHS	0.0	8.3	50.0	25.0	16.7
Sawla SHS	0.0	8.3	41.7	50.0	0.0

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Senya SHS	8.3	0.0	50.0	33.3	8.3
St. Stephen's Presby SHTS	0.0	0.0	41.7	50.0	8.3
St. Ann's Girls SHS	0.0	8.3	75.0	16.7	0.0
St. Augustine SHTS	0.0	25.0	58.3	16.7	0.0
St. Charles SHS	41.7	41.7	16.7	0.0	0.0
St. John's Integrated SHTS	0.0	0.0	16.7	41.7	41.7
St. Joseph SHS	16.7	16.7	33.3	25.0	8.3
St. Michael's SHS	0.0	0.0	25.0	50.0	25.0
Nkawkaw St. Michael's SHS	0.0	8.3	25.0	41.7	25.0
Tamale SHS	25.0	16.7	41.7	0.0	16.7
Tanyigbe SHS	0.0	0.0	58.3	16.7	25.0
Taviefe Community SHS	0.0	8.3	41.7	33.3	16.7
Tawheed SHS	8.3	8.3	33.3	8.3	41.7
Tema Manhean SHTS	8.3	25.0	25.0	33.3	8.3
Terchire SHS	0.0	0.0	0.0	25.0	75.0
Tijjaniya SHS	0.0	16.7	25.0	58.3	0.0
Tongo SHTS	0.0	16.7	25.0	16.7	41.7
Tongor SHTS	8.3	33.3	33.3	25.0	0.0
Tuna SHTS	0.0	0.0	16.7	41.7	41.7
Uthman Bin Afam SHS	8.3	33.3	16.7	41.7	0.0

	Highly proficient	Proficient	Approaching proficiency	Developing proficiency	Emerging
Ve Community SHS	0.0	0.0	46.2	7.7	46.2
Wapuli Community SHS	0.0	8.3	16.7	16.7	58.3
Worawora SHS	0.0	0.0	25.0	41.7	33.3
Yagaba SHS	0.0	0.0	8.3	25.0	66.7
St Augustine SHS	0.0	0.0	25.0	58.3	16.7

Table A3.11 Item framework of science literacy assessment by region

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Ahafo	50.0	54.1	44.2	38.3	25.0	44.6	33.3	61.3	37.3
Ashanti	80.2	61.8	52.2	47.6	40.3	53.8	41.0	66.3	47.3
Bono	76.2	65.9	59.3	47.3	26.8	58.9	38.9	74.4	46.3
Bono East	81.3	56.0	48.6	38.8	22.9	49.7	31.3	62.7	37.9
Central	77.3	64.9	54.6	51.0	29.5	55.4	42.9	69.3	48.5
Eastern	83.3	64.3	54.9	49.4	35.3	56.3	39.4	69.0	48.0
Greater Accra	83.3	68.8	57.8	54.9	35.8	60.0	45.0	72.9	52.4
North East	40.0	46.9	35.3	35.0	20.0	35.6	32.1	50.1	33.3
Northern	66.7	64.7	53.3	49.3	30.0	55.1	41.1	71.1	46.7

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Oti	58.3	54.8	46.9	39.3	11.1	46.9	28.4	62.4	36.4
Savannah	50.0	53.1	45.4	36.9	16.7	44.8	28.4	61.5	34.3
Upper East	78.3	64.5	54.0	50.1	34.2	55.3	42.6	70.2	47.7
Upper West	62.5	55.4	46.7	41.5	26.0	46.8	34.0	60.9	40.6
Volta	82.6	66.0	58.9	48.9	29.4	58.7	39.4	72.3	46.9
Western	83.3	68.6	58.0	54.1	40.3	59.5	47.2	72.0	52.5
Western North	79.2	67.1	57.4	52.8	50.0	58.7	44.0	69.6	51.5

Table A3.12 Item framework of science literacy assessment by school

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Adankwaman SHS	100.0	66.5	52.2	62.8	37.5	59.1	43.5	65.1	58.3

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Adjen Kotoku SHS	91.7	73.9	63.8	61.7	41.7	66.4	49.1	78.6	58.8
Adugyama Community SHS	91.7	71.8	61.6	60.0	41.7	63.4	54.6	74.2	59.3
Afife SHTS	66.7	56.8	51.8	38.3	16.7	50.5	28.7	63.9	35.8
Agate Community SHS	91.7	70.5	65.6	49.4	33.3	66.1	33.3	80.6	46.1
Agotime SHS	100.0	73.5	65.2	57.2	25.0	64.2	48.1	79.0	52.5
Ahamansu Islamic SHS	33.3	47.2	37.7	30.6	0.0	37.4	22.2	53.6	27.5
Akokoaso SHTS	83.3	63.5	57.6	45.0	20.8	56.2	37.0	70.2	41.7
Amantin SHS	83.3	41.2	37.3	22.2	12.5	36.3	14.8	49.6	22.1
Anlo Awomefia SHS	83.3	72.4	61.2	55.6	66.7	63.2	52.8	75.4	57.8
Apeguso SHS	83.3	69.7	63.0	51.1	41.7	63.4	40.7	79.4	52.0
Aperade SHTS	91.7	64.1	50.4	52.8	54.2	53.0	47.2	61.1	52.5
Awutu Bawjiase Community SHS	91.7	72.2	63.0	61.1	25.0	64.0	47.2	75.4	57.8
Awutu Winton SHS	66.7	58.5	47.8	39.4	20.8	47.6	33.3	62.7	35.8
Ayanfuri SHS	75.0	60.3	55.1	33.9	16.7	51.9	25.9	70.6	31.9
Ayirebi SHS	83.3	72.4	63.4	58.9	58.3	66.9	43.5	79.4	58.3

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Bassa Community SHS	75.0	56.2	51.4	34.4	25.0	49.7	30.6	66.7	34.3
Bimbilla SHS	45.5	57.3	46.6	44.2	22.7	46.9	34.3	60.6	41.2
Birifoh SHS	50.0	52.1	43.8	37.8	12.5	41.7	32.4	57.1	34.8
Bonzo-Kaku SHS	83.3	67.7	57.6	52.8	33.3	59.4	43.5	72.2	51.0
Boso SHTS	91.7	61.3	51.8	44.4	37.5	53.8	35.2	68.7	43.1
Bosomtwe Oyoko Community SHS	75.0	58.1	51.1	41.1	20.8	51.9	30.6	63.9	39.2
Brakwa SHTS	91.7	78.8	69.2	65.6	54.2	69.6	57.4	81.7	64.7
Business SHS	91.7	65.4	59.4	43.9	33.3	59.7	38.9	76.6	44.1
Diamono SHS	83.3	60.5	58.0	36.7	25.0	53.8	36.1	73.4	38.2
Diaso SHS	100.0	77.4	69.9	62.8	20.8	70.4	48.1	86.5	57.4
Diaspora Girls' SHS	100.0	81.2	70.3	67.2	62.5	73.9	50.9	83.3	65.7
Ejisuman SHS	75.0	65.6	54.0	49.4	29.2	57.3	39.8	73.8	46.1
Esiama SHTS	91.7	63.9	52.9	55.0	50.0	55.4	50.9	62.3	54.9
Han SHS	66.7	54.5	47.1	41.1	25.0	48.9	30.6	64.7	40.2
Ibadur Rahman Academy SHS	66.7	63.9	55.4	42.8	20.8	55.4	33.3	72.2	39.7
Jacobu SHTS	75.0	56.2	52.2	38.3	33.3	51.1	33.3	68.3	39.2
Jema SHS	66.7	61.3	48.6	50.0	33.3	52.7	41.7	60.7	49.5

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Jukwa SHTS	58.3	57.3	46.4	46.1	37.5	47.0	44.4	61.9	46.6
Klo Agogo SHS	91.7	66.2	57.2	52.2	29.2	58.6	42.6	72.6	50.0
Kete Krachi SHTS	75.0	61.3	57.2	45.6	20.8	56.2	32.4	71.4	44.1
Kofiase Adventist SHTS	83.3	66.5	58.0	52.8	58.3	58.3	50.0	69.8	55.4
Kpone Community SHS	75.0	70.9	58.3	57.8	29.2	59.7	48.1	75.0	54.4
Kraboaa-Coaltar Presby SHTS	100.0	60.0	47.1	51.7	20.8	51.3	43.5	63.5	48.0
Krobo Community SHS	100.0	65.4	57.2	48.3	20.8	59.9	38.0	73.8	45.6
Kurofa Methodist SHS	91.7	47.9	32.6	37.8	37.5	36.8	36.1	50.4	37.7
Kwahu Tafo SHS	100.0	74.1	65.9	57.8	54.2	66.9	50.9	76.2	59.8
Kwanwoma SHTS	83.3	60.5	50.7	51.7	45.8	51.6	48.1	59.1	51.5
Kwaobaah Nyanoa Community SHS	41.7	54.5	43.8	37.8	29.2	45.2	29.6	62.3	35.8
Langbinsi SHTS	33.3	39.7	25.0	32.2	20.8	26.3	36.1	38.5	31.4

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Lashibi Community Day SHS	100.0	70.3	61.6	54.4	37.5	63.4	43.5	76.6	52.9
Leklebi SHS	83.3	71.6	62.3	53.9	20.8	64.2	41.7	81.0	51.5
Maame Krobo Community SHS	83.3	49.4	40.9	31.7	37.5	37.6	33.3	53.2	33.8
Manso-Amenfi Community Day SHS	75.0	62.4	53.6	51.7	50.0	54.3	44.4	65.9	51.0
Moree Community SHS	83.3	70.5	61.2	57.2	37.5	61.6	50.0	73.0	56.9
Mpaha Community SHS	25.0	45.1	35.9	27.8	12.5	34.1	26.9	50.8	26.0
Navrongo SHS	75.0	53.8	41.7	38.3	20.8	42.7	33.3	62.7	34.8
Nkenkansu Community SHS	33.3	53.4	37.3	40.6	33.3	40.9	38.9	51.6	40.7
Nkrankwanta Community SHS	58.3	64.1	55.4	45.6	12.5	52.2	45.4	72.6	42.2
Northern Star SHS	41.7	45.5	33.0	31.7	25.0	33.1	30.6	46.0	32.8
Notre Dame Girls SHS	91.7	84.0	75.0	70.0	54.2	77.2	57.4	90.1	68.6

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Notre Dame Seminary SHS	100.0	95.3	78.3	85.6	75.0	81.7	80.6	97.2	80.4
Nuru-Ameen Islamic SHS	91.7	62.8	54.3	52.8	54.2	56.5	48.1	67.9	54.4
Nyinahin Catholic SHS	100.0	80.8	68.5	63.3	91.7	72.3	61.1	83.3	65.7
O.L.L. Girls SHS	75.0	65.8	57.6	49.4	37.5	58.3	38.9	69.8	49.0
Odoben SHS	41.7	60.0	47.8	43.9	16.7	47.0	41.7	61.1	41.7
Ogyeedom Community SHTS	50.0	44.7	28.6	38.9	33.3	31.7	39.8	47.2	37.7
Onwe SHS	100.0	63.2	56.5	48.9	33.3	58.3	39.8	69.0	47.5
Opoku Agyeman SHTS	66.7	45.9	37.7	31.1	16.7	39.5	20.4	56.3	29.4
Osei Adutwum SHS	75.0	69.0	59.8	53.9	41.7	62.6	43.5	75.0	54.4
Our Lady of Providence SHS	83.3	74.4	66.3	52.2	33.3	69.4	37.0	84.9	49.5
Kwamang Presbyterian SHTS	83.3	65.6	58.3	53.3	20.8	59.9	37.0	71.4	52.0
Prampram SHS	83.3	57.5	47.8	41.1	45.8	49.2	38.0	63.1	41.7

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Mampong Presbyterian SHS	100.0	68.8	61.3	61.2	59.1	61.6	52.5	69.7	62.6
Prince of Peace Girls SHS	75.0	62.8	49.6	51.1	45.8	51.3	45.4	58.7	48.5
Sunyani S.D.A SHS	58.3	56.8	50.0	41.1	29.2	50.0	30.6	62.7	42.2
Sang Community Day SHS	0.0	40.4	22.1	26.1	16.7	24.7	25.0	42.5	25.5
Samuel Otu Presby SHS	66.7	64.7	56.5	45.6	25.0	56.7	36.1	76.2	41.7
Saviour SHS	83.3	64.5	56.5	47.2	20.8	57.3	35.2	69.8	45.1
Sawla SHS	75.0	64.1	55.4	53.3	33.3	57.3	38.0	67.9	52.0
Senya SHS	91.7	67.7	59.1	49.4	25.0	59.7	40.7	76.6	45.1
St. Stephen's Presby SHTS	66.7	61.3	53.3	42.2	8.3	53.5	28.7	66.7	38.7
St. Ann's Girls SHS	100.0	66.9	63.0	45.6	20.8	63.4	31.5	77.4	45.1
St. Augustine SHTS	91.7	69.7	63.0	55.6	41.7	63.4	42.6	75.8	54.4
St. Charles SHS	100.0	90.2	74.3	80.6	50.0	78.0	72.2	94.0	73.5

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
St. John's Integrated SHTS	75.0	51.3	43.5	37.2	16.7	44.1	29.6	56.7	36.3
St. Joseph SHS	83.3	71.8	61.2	53.9	50.0	63.2	43.5	73.4	52.0
St. Michael's SHS	100.0	55.3	47.5	40.0	16.7	48.9	26.9	67.9	36.3
Nkawkaw St. Michael's SHS	66.7	56.8	43.8	47.2	33.3	46.5	36.1	57.5	43.6
Tamale SHS	91.7	74.8	69.9	56.1	29.2	69.4	41.7	85.3	54.4
Tanyigbe SHS	75.0	58.1	54.3	41.7	29.2	49.7	40.7	64.7	42.2
Taviefe Community SHS	83.3	60.5	53.6	54.4	20.8	55.6	36.1	61.9	51.5
Tawheed SHS	58.3	60.5	49.3	40.0	33.3	49.2	36.1	63.9	39.2
Tema Manhean SHTS	66.7	71.2	57.2	59.4	25.0	61.3	46.3	71.0	53.9
Terchire SHS	33.3	43.4	31.9	31.1	25.0	32.5	30.6	46.4	32.8
Tijjaniya SHS	83.3	62.2	54.3	48.9	54.2	56.2	40.7	64.3	52.5
Tongo SHTS	66.7	56.2	48.9	40.0	20.8	49.7	30.6	64.7	38.2
Tongor SHTS	100.0	74.1	68.8	53.3	29.2	66.7	44.4	81.7	50.5
Tuna SHTS	50.0	50.0	44.9	29.4	4.2	43.0	20.4	65.9	25.0
Uthman Bin Afam SHS	75.0	74.1	63.4	54.4	37.5	63.7	47.2	81.3	51.5
Ve Community SHS	61.5	57.0	47.8	36.9	23.1	48.4	29.9	63.4	35.3

	<i>Local/National/Social</i>	<i>Global (Life across the world)</i>	<i>Identify scientifically oriented issues</i>	<i>Explain phenomena scientifically</i>	<i>Use scientific evidence</i>	<i>Knowledge of science (physical, living and technology systems, etc.)</i>	<i>Knowledge about science (scientific inquiry and explanations)</i>	<i>Low</i>	<i>Medium</i>
Wapuli Community SHS	50.0	53.0	40.9	40.0	20.8	43.5	27.8	57.1	35.8
Worawora SHS	66.7	55.8	45.7	41.7	12.5	47.0	30.6	62.3	37.7
Yagaba SHS	41.7	44.4	35.1	29.4	16.7	34.4	25.9	52.0	27.9
St Augustine SHS	58.3	54.7	47.1	40.0	12.5	46.2	34.3	59.9	38.2

Table A3.13 Proficiency in 21st century skills by region

Region	Highly proficient	Proficient	Approaching proficiency	Developing	Emerging
Ahafo	8.3	20.8	37.5	25.0	8.3
Ashanti	8.0	19.1	38.7	28.4	5.8
Bono	8.3	28.6	34.5	22.6	6.0
Bono East	10.6	17.0	31.9	17.0	23.4
Central	9.1	27.3	32.6	25.8	5.3
Eastern	8.3	27.8	36.1	22.2	5.6
Greater Accra	6.7	28.3	41.7	18.3	5.0
North East	0.0	8.3	25.0	33.3	33.3
Northern	6.7	16.7	30.0	23.3	23.3
Oti	0.0	13.9	38.9	36.1	11.1
Savannah	0.0	5.6	27.8	47.2	19.4

Region	Highly proficient	Proficient	Approaching proficiency	Developing	Emerging
Upper East	10.0	21.7	31.7	31.7	5.0
Upper West	0.0	10.4	37.5	33.3	18.8
Volta	4.6	27.8	43.5	21.3	2.8
Western	5.6	22.2	47.2	22.2	2.8
Western North	8.3	33.3	33.3	20.8	4.2
Total	6.9	22.3	36.2	25.8	8.8

Table A3.14 Proficiency in 21st century skills by school

School	Highly proficient	Proficient	Approaching proficiency	Developing	Emerging
Adankwaman SHS	8.3	41.7	25.0	16.7	8.3
Adjen Kotoku SHS	0.0	16.7	50.0	33.3	0.0
Adugyama Community SHS	0.0	16.7	66.7	16.7	0.0
Afife SHTS	0.0	16.7	25.0	50.0	8.3
Agate Community SHS	0.0	8.3	58.3	33.3	0.0
Agotime SHS	8.3	41.7	41.7	8.3	0.0
Ahamansu Islamic SHS	0.0	8.3	50.0	33.3	8.3
Akokoaso SHTS	0.0	33.3	50.0	8.3	8.3
Amantin SHS	0.0	0.0	25.0	8.3	66.7

School	Highly proficient	Proficient	Approaching proficiency	Developing	Emerging
Anlo Awomefia SHS	25.0	41.7	33.3	0.0	0.0
Apeguso SHS	8.3	25.0	50.0	16.7	0.0
Aperade SHTS	0.0	16.7	41.7	33.3	8.3
Awutu Bawjiase Community SHS	0.0	33.3	66.7	0.0	0.0
Awutu Winton SHS	0.0	33.3	25.0	33.3	8.3
Ayanfuri SHS	8.3	16.7	16.7	58.3	0.0
Ayirebi SHS	0.0	33.3	33.3	33.3	0.0
Bassa Community SHS	8.3	8.3	50.0	25.0	8.3
Bimbilla SHS	0.0	25.0	50.0	25.0	0.0
Birifoh SHS	0.0	0.0	25.0	58.3	16.7
Bonzo-Kaku SHS	16.7	33.3	33.3	16.7	0.0
Boso SHTS	25.0	33.3	33.3	8.3	0.0
Bosomtwe Oyoko Community SHS	0.0	16.7	66.7	16.7	0.0
Brakwa SHTS	33.3	33.3	25.0	8.3	0.0
Business SHS	8.3	16.7	41.7	33.3	0.0
Diamono SHS	0.0	8.3	25.0	58.3	8.3
Diaso SHS	8.3	41.7	33.3	16.7	0.0
Diaspora Girls' SHS	33.3	66.7	0.0	0.0	0.0
Ejsuman SHS	8.3	33.3	41.7	8.3	8.3
Esiama SHTS	0.0	25.0	66.7	8.3	0.0
Han SHS	0.0	16.7	58.3	8.3	16.7
Ibadur Rahman Academy SHS	8.3	25.0	41.7	25.0	0.0
Jacobu SHTS	16.7	0.0	41.7	41.7	0.0

School	Highly proficient	Proficient	Approaching proficiency	Developing	Emerging
Jema SHS	0.0	10.0	30.0	40.0	20.0
Jukwa SHTS	0.0	25.0	41.7	33.3	0.0
Klo Agogo SHS	0.0	25.0	58.3	16.7	0.0
Kete Krachi SHTS	0.0	0.0	25.0	50.0	25.0
Kofiase Adventist SHTS	8.3	33.3	33.3	25.0	0.0
Kpone Community SHS	8.3	33.3	41.7	0.0	16.7
Kraboaa-Coaltar Presby SHTS	8.3	25.0	41.7	16.7	8.3
Krobo Community SHS	30.8	46.2	23.1	0.0	0.0
Kurofa Methodist SHS	0.0	0.0	33.3	58.3	8.3
Kwahu Tafo SHS	16.7	50.0	16.7	16.7	0.0
Kwanwoma SHTS	0.0	16.7	33.3	41.7	8.3
Kwaobaah Nyanoa Community SHS	0.0	0.0	33.3	66.7	0.0
Langbinsi SHTS	0.0	0.0	8.3	50.0	41.7
Lashibi Community Day SHS	8.3	16.7	33.3	41.7	0.0
Leklebi SHS	8.3	16.7	50.0	25.0	0.0
Maame Krobo Community SHS	0.0	16.7	16.7	25.0	41.7
Manso-Amenfi Community Day SHS	16.7	41.7	16.7	16.7	8.3
Moree Community SHS	0.0	33.3	41.7	16.7	8.3

School	Highly proficient	Proficient	Approaching proficiency	Developing	Emerging
Mpaha Community SHS	0.0	0.0	8.3	58.3	33.3
Navrongo SHS	8.3	0.0	50.0	33.3	8.3
Nkenkansu Community SHS	0.0	0.0	16.7	50.0	33.3
Nkrankwanta Community SHS	8.3	41.7	16.7	33.3	0.0
Northern Star SHS	0.0	8.3	8.3	41.7	41.7
Notre Dame Girls SHS	41.7	58.3	0.0	0.0	0.0
Notre Dame Seminary SHS	33.3	66.7	0.0	0.0	0.0
Nuru-Ameen Islamic SHS	0.0	33.3	33.3	16.7	16.7
Nyinahin Catholic SHS	66.7	25.0	8.3	0.0	0.0
O.L.L. Girls SHS	8.3	16.7	58.3	16.7	0.0
Odoben SHS	25.0	25.0	16.7	33.3	0.0
Ogyeedom Community SHTS	0.0	0.0	16.7	50.0	33.3
Onwe SHS	16.7	25.0	25.0	33.3	0.0
Opoku Agyeman SHTS	0.0	0.0	45.5	45.5	9.1
Osei Adutwum SHS	18.2	36.4	27.3	18.2	0.0
Our Lady of Providence SHS	8.3	66.7	16.7	8.3	0.0
Kwamang Presbyterian SHTS	16.7	50.0	16.7	16.7	0.0

School	Highly proficient	Proficient	Approaching proficiency	Developing	Emerging
Prampram SHS	16.7	16.7	41.7	16.7	8.3
Mampong Presbyterian SHS	0.0	25.0	33.3	41.7	0.0
Prince of Peace Girls SHS	0.0	27.3	54.6	18.2	0.0
Sunyani S.D.A SHS	0.0	16.7	33.3	16.7	33.3
Sang Community Day SHS	0.0	0.0	33.3	25.0	41.7
Samuel Otu Presby SHS	16.7	41.7	25.0	8.3	8.3
Saviour SHS	16.7	16.7	50.0	16.7	0.0
Sawla SHS	0.0	8.3	41.7	50.0	0.0
Senya SHS	16.7	16.7	50.0	16.7	0.0
St. Stephen's Presby SHTS	0.0	8.3	66.7	16.7	8.3
St. Ann's Girls SHS	0.0	8.3	75.0	16.7	0.0
St. Augustine SHTS	0.0	16.7	58.3	25.0	0.0
St. Charles SHS	16.7	33.3	33.3	16.7	0.0
St. John's Integrated SHTS	0.0	16.7	25.0	50.0	8.3
St. Joseph SHS	0.0	25.0	50.0	25.0	0.0
St. Michael's SHS	0.0	0.0	41.7	33.3	25.0
Nkawkaw St. Michael's SHS	0.0	16.7	33.3	41.7	8.3
Tamale SHS	8.3	33.3	41.7	16.7	0.0
Tanyigbe SHS	0.0	41.7	50.0	0.0	8.3

School	Highly proficient	Proficient	Approaching proficiency	Developing	Emerging
Taviefe Community SHS	0.0	41.7	41.7	16.7	0.0
Tawheed SHS	8.3	25.0	25.0	41.7	0.0
Tema Manhean SHTS	0.0	58.3	41.7	0.0	0.0
Terchire SHS	0.0	0.0	50.0	41.7	8.3
Tijjaniya SHS	0.0	25.0	66.7	8.3	0.0
Tongo SHTS	0.0	8.3	25.0	58.3	8.3
Tongor SHTS	0.0	33.3	58.3	8.3	0.0
Tuna SHTS	0.0	8.3	33.3	33.3	25.0
Uthman Bin Afam SHS	0.0	8.3	41.7	41.7	8.3
Ve Community SHS	0.0	8.3	33.3	50.0	8.3
Wapuli Community SHS	0.0	0.0	0.0	25.0	75.0
Worawora SHS	0.0	33.3	41.7	25.0	0.0
Yagaba SHS	0.0	0.0	16.7	25.0	58.3
St Augustine SHS	0.0	0.0	75.0	25.0	0.0

Table A3.15 Item framework of 21st century skills by region

Region	Cultural identity, civic literacy, and global citizenship	Financial literacy and entrepreneurship	ICT and digital literacy	Self-discipline	Discipline and Integrity	Leadership	Responsible citizenship	Adaptability and resourcefulness	Critical thinking and problem-solving
Ahafo	58.3	44.0	66.7	57.5	78.1	58.3	64.2	50.0	31.0

Ashanti	59.5	44.6	64.3	61.7	75.8	53.9	62.5	55.1	31.6
Bono	62.2	45.6	67.9	61.4	75.6	54.4	65.5	58.7	31.5
Bono East	56.3	40.4	58.9	54.5	75.5	48.2	47.7	59.6	33.3
Central	62.6	50.4	61.6	61.4	77.3	54.8	61.2	59.3	30.7
Eastern	61.7	43.6	66.3	61.9	77.2	60.9	62.7	61.7	31.5
Greater Accra	62.9	49.0	62.2	61.7	80.8	66.1	71.0	59.4	28.5
North East	47.5	36.1	45.4	42.8	61.1	41.7	40.6	49.1	29.0
Northern	52.7	42.4	48.3	58.0	75.8	46.7	51.7	55.0	29.4
Oti	51.5	43.7	54.6	58.9	68.1	51.9	56.7	50.9	30.2
Savannah	45.5	34.1	58.3	41.7	65.3	43.5	55.6	47.2	26.9
Upper East	59.7	46.2	55.6	66.7	87.1	58.3	58.3	66.1	26.7
Upper West	50.8	36.3	47.9	56.7	75.5	53.5	53.3	48.6	26.6
Volta	60.3	46.2	57.7	66.1	78.9	61.1	67.4	62.7	30.5
Western	61.9	40.9	68.5	60.6	78.5	45.4	67.2	65.7	32.1
Western North	67.0	42.9	61.1	57.5	81.3	55.6	65.8	58.3	34.3

Table A3.16 Item framework of 21st century skills by region

school	Cultural identity, civic literacy, and global citizenship	Financial literacy and entrepreneurship	ICT and digital literacy	Self-discipline	Discipline and Integrity	Leadership	Responsible citizenship	Adaptability and resourcefulness	Critical thinking and problem-solving
Adankwaman SHS	75.0	54.8	72.2	76.7	75.0	61.1	63.3	36.1	13.9
Adjen Kotoku SHS	59.1	50.0	61.1	60.0	77.1	63.9	73.3	61.1	19.4
Adugyama Community SHS	51.5	40.5	66.7	75.0	81.3	58.3	75.0	61.1	27.8
Afife SHTS	53.8	39.3	50.0	60.0	75.0	52.8	45.0	61.1	31.5
Agate Community SHS	50.0	34.5	52.8	56.7	83.3	55.6	70.0	41.7	28.7
Agotime SHS	63.6	56.0	66.7	70.0	72.9	72.2	71.7	75.0	34.3
Ahamansu Islamic SHS	45.5	41.7	52.8	56.7	64.6	61.1	60.0	52.8	30.6
Akokoaso SHTS	55.3	45.2	69.4	60.0	81.3	63.9	58.3	72.2	35.2
Amantin SHS	40.9	27.4	52.8	35.0	64.6	33.3	28.3	41.7	23.1
Anlo Awomefia SHS	77.3	58.3	66.7	68.3	93.8	72.2	78.3	66.7	38.9
Apeguso SHS	70.5	38.1	72.2	65.0	70.8	61.1	56.7	63.9	25.0
Aperade SHTS	56.1	39.3	58.3	66.7	68.8	55.6	51.7	47.2	19.4
Awutu Bawjiase Community SHS	69.7	57.1	55.6	73.3	83.3	61.1	63.3	66.7	31.5
Awutu Winton SHS	50.8	39.3	61.1	56.7	91.7	52.8	61.7	63.9	31.5
Ayanfuri SHS	53.0	52.4	61.1	58.3	79.2	47.2	56.7	55.6	33.3
Ayirebi SHS	63.6	39.3	63.9	55.0	87.5	63.9	68.3	75.0	25.0

school	Cultural identity, civic literacy, and global citizenship	Financial literacy and entrepreneurship	ICT and digital literacy	Self-discipline	Discipline and Integrity	Leadership	Responsible citizenship	Adaptability and resourcefulness	Critical thinking and problem-solving
Bassa Community SHS	54.5	40.5	52.8	55.0	79.2	52.8	61.7	58.3	33.3
Bimbilla SHS	65.2	45.2	55.6	58.3	75.0	69.4	48.3	52.8	37.0
Birifoh SHS	43.2	26.2	44.4	50.0	79.2	50.0	48.3	47.2	28.7
Bonzo-Kaku SHS	67.4	41.7	63.9	65.0	89.6	50.0	68.3	66.7	41.7
Boso SHTS	69.7	53.6	69.4	76.7	81.3	58.3	71.7	66.7	39.8
Bosomtwe Oyoko Community SHS	59.1	40.5	55.6	63.3	81.3	61.1	70.0	52.8	27.8
Brakwa SHTS	73.5	53.6	55.6	61.7	79.2	66.7	81.7	66.7	49.1
Business SHS	59.1	45.2	52.8	63.3	83.3	61.1	58.3	58.3	31.5
Diamono SHS	46.2	41.7	61.1	56.7	64.6	41.7	58.3	30.6	27.8
Diaso SHS	64.4	60.7	72.2	50.0	85.4	47.2	73.3	75.0	30.6
Diaspora Girls' SHS	79.5	54.8	86.1	81.7	87.5	72.2	85.0	77.8	45.4
Ejisuman SHS	68.2	47.6	58.3	68.3	83.3	52.8	66.7	69.4	28.7
Esiama SHTS	63.6	42.9	63.9	56.7	83.3	55.6	73.3	69.4	26.9
Han SHS	57.6	40.5	69.4	56.7	81.3	50.0	53.3	52.8	29.6
Ibadur Rahman Academy SHS	56.1	47.6	63.9	65.0	79.2	58.3	73.3	61.1	37.0
Jacobu SHTS	59.1	46.4	69.4	60.0	72.9	50.0	50.0	58.3	38.9
Jema SHS	57.3	34.3	46.7	46.0	62.5	36.7	56.0	50.0	28.9
Jukwa SHTS	65.2	40.5	52.8	58.3	81.3	55.6	53.3	69.4	26.9
Klo Agogo SHS	66.7	40.5	69.4	65.0	87.5	61.1	66.7	66.7	26.9

school	Cultural identity, civic literacy, and global citizenship	Financial literacy and entrepreneurship	ICT and digital literacy	Self-discipline	Discipline and Integrity	Leadership	Responsible citizenship	Adaptability and resourcefulness	Critical thinking and problem-solving
Kete Krachi SHTS	42.4	42.9	47.2	46.7	64.6	41.7	41.7	36.1	33.3
Kofiase Adventist SHTS	69.7	50.0	75.0	58.3	81.3	72.2	66.7	55.6	34.3
Kpone Community SHS	62.9	46.4	69.4	63.3	85.4	58.3	73.3	52.8	32.4
Kraboaa-Coaltar Presby SHTS	53.8	45.2	75.0	66.7	79.2	72.2	61.7	63.9	27.8
Krobo Community SHS	71.3	57.1	79.5	78.5	92.3	66.7	46.2	84.6	46.2
Kurofa Methodist SHS	58.3	40.5	63.9	51.7	56.3	33.3	35.0	36.1	30.6
Kwahu Tafo SHS	77.3	44.0	61.1	70.0	87.5	69.4	65.0	66.7	32.4
Kwanwoma SHTS	56.1	33.3	72.2	46.7	77.1	41.7	65.0	52.8	33.3
Kwaobaah Nyanoa Community SHS	46.2	38.1	61.1	46.7	70.8	44.4	60.0	55.6	22.2
Langbinsi SHTS	36.4	29.8	41.7	40.0	60.4	27.8	43.3	33.3	29.6
Lashibi Community Day SHS	59.8	48.8	63.9	55.0	75.0	69.4	66.7	69.4	22.2
Leklebi SHS	63.6	41.7	52.8	66.7	89.6	55.6	68.3	72.2	29.6
Maame Krobo Community SHS	51.5	33.3	36.1	45.0	56.3	41.7	40.0	33.3	38.0

school	Cultural identity, civic literacy, and global citizenship	Financial literacy and entrepreneurship	ICT and digital literacy	Self-discipline	Discipline and Integrity	Leadership	Responsible citizenship	Adaptability and resourcefulness	Critical thinking and problem-solving
Manso-Amenfi Community Day SHS	69.7	40.5	61.1	60.0	75.0	55.6	61.7	61.1	36.1
Moree Community SHS	63.6	50.0	55.6	61.7	70.8	55.6	65.0	61.1	32.4
Mpaha Community SHS	43.9	28.6	44.4	31.7	54.2	36.1	55.0	38.9	22.2
Navrongo SHS	49.2	40.5	69.4	61.7	77.1	52.8	58.3	61.1	27.8
Nkenkansu Community SHS	45.5	35.7	52.8	51.7	62.5	44.4	48.3	36.1	21.3
Nkrankwanta Community SHS	67.4	40.5	88.9	60.0	75.0	63.9	58.3	55.6	32.4
Northern Star SHS	43.2	38.1	44.4	53.3	45.8	52.8	40.0	36.1	13.9
Notre Dame Girls SHS	81.8	63.1	72.2	83.3	95.8	66.7	85.0	80.6	37.0
Notre Dame Seminary SHS	81.1	64.3	66.7	88.3	100.0	58.3	78.3	69.4	36.1
Nuru-Ameen Islamic SHS	48.5	46.4	69.4	66.7	77.1	38.9	76.7	52.8	29.6
Nyinahin Catholic SHS	71.2	70.2	77.8	93.3	100.0	63.9	75.0	63.9	51.9
O.L.L. Girls SHS	68.2	38.1	47.2	60.0	91.7	69.4	61.7	66.7	31.5
Odoben SHS	59.1	63.1	69.4	66.7	64.6	55.6	53.3	63.9	38.0

school	Cultural identity, civic literacy, and global citizenship	Financial literacy and entrepreneurship	ICT and digital literacy	Self-discipline	Discipline and Integrity	Leadership	Responsible citizenship	Adaptability and resourcefulness	Critical thinking and problem-solving
Ogyeedom Community SHTS	51.5	39.3	58.3	38.3	47.9	50.0	25.0	25.0	16.7
Onwe SHS	63.6	50.0	75.0	53.3	83.3	61.1	66.7	58.3	34.3
Opoku Agyeman SHTS	52.1	39.0	75.8	47.3	61.4	45.5	49.1	48.5	28.3
Osei Adutwum SHS	63.6	45.5	72.7	69.1	84.1	69.7	74.5	63.6	34.3
Our Lady of Providence SHS	68.2	53.6	58.3	76.7	89.6	55.6	80.0	66.7	37.0
Kwamang Presbyterian SHTS	62.9	50.0	86.1	66.7	81.3	69.4	71.7	58.3	35.2
Prampram SHS	65.2	51.2	58.3	66.7	83.3	61.1	68.3	47.2	28.7
Mampong Presbyterian SHS	59.8	52.4	58.3	56.7	66.7	44.4	58.3	58.3	28.7
Prince of Peace Girls SHS	67.8	39.0	36.4	65.5	81.8	78.8	61.8	60.6	28.3
Sunyani S.D.A SHS	56.8	40.5	55.6	50.0	60.4	55.6	58.3	50.0	20.4
Sang Community Day SHS	47.7	27.4	38.9	46.7	62.5	27.8	28.3	41.7	24.1
Samuel Otu Presby SHS	59.8	50.0	72.2	71.7	83.3	58.3	76.7	63.9	29.6

school	Cultural identity, civic literacy, and global citizenship	Financial literacy and entrepreneurship	ICT and digital literacy	Self-discipline	Discipline and Integrity	Leadership	Responsible citizenship	Adaptability and resourcefulness	Critical thinking and problem-solving
Saviour SHS	67.4	54.8	63.9	60.0	85.4	63.9	68.3	63.9	30.6
Sawla SHS	45.5	36.9	75.0	53.3	75.0	58.3	58.3	61.1	28.7
Senya SHS	62.9	44.0	63.9	73.3	91.7	50.0	76.7	69.4	34.3
St. Stephen's Presby SHTS	51.5	42.9	55.6	51.7	77.1	58.3	61.7	58.3	28.7
St. Ann's Girls SHS	56.8	39.3	72.2	53.3	75.0	50.0	55.0	61.1	38.0
St. Augustine SHTS	59.1	40.5	33.3	66.7	95.8	61.1	71.7	58.3	34.3
St. Charles SHS	60.6	57.1	55.6	70.0	97.9	61.1	76.7	66.7	35.2
St. John's Integrated SHTS	56.1	41.7	47.2	66.7	79.2	63.9	58.3	66.7	18.5
St. Joseph SHS	64.4	45.2	61.1	55.0	87.5	55.6	70.0	55.6	32.4
St. Michael's SHS	57.6	35.7	61.1	46.7	72.9	33.3	45.0	38.9	20.4
Nkawkaw St. Michael's SHS	53.8	34.5	66.7	51.7	56.3	58.3	53.3	55.6	40.7
Tamale SHS	63.6	52.4	63.9	65.0	85.4	55.6	68.3	72.2	35.2
Tanyigbe SHS	64.4	48.8	58.3	68.3	77.1	66.7	75.0	69.4	28.7
Taviefe Community SHS	56.8	53.6	55.6	75.0	81.3	58.3	66.7	58.3	27.8
Tawheed SHS	58.3	46.4	63.9	61.7	70.8	58.3	61.7	63.9	30.6
Tema Manhean SHTS	67.4	48.8	58.3	63.3	83.3	77.8	73.3	66.7	39.8
Terchire SHS	56.8	38.1	61.1	43.3	72.9	58.3	51.7	36.1	32.4
Tijjaniya SHS	65.2	40.5	52.8	71.7	66.7	61.1	68.3	55.6	33.3

school	Cultural identity, civic literacy, and global citizenship	Financial literacy and entrepreneurship	ICT and digital literacy	Self-discipline	Discipline and Integrity	Leadership	Responsible citizenship	Adaptability and resourcefulness	Critical thinking and problem-solving
Tongo SHTS	43.9	46.4	47.2	56.7	87.5	47.2	35.0	66.7	19.4
Tongor SHTS	65.2	46.4	63.9	63.3	77.1	66.7	76.7	80.6	25.0
Tuna SHTS	47.0	36.9	55.6	40.0	66.7	36.1	53.3	41.7	29.6
Uthman Bin Afam SHS	54.5	38.1	77.8	60.0	62.5	30.6	60.0	61.1	27.8
Ve Community SHS	47.7	36.9	52.8	66.7	60.4	50.0	55.0	38.9	29.6
Wapuli Community SHS	32.6	29.8	30.6	45.0	50.0	27.8	26.7	36.1	21.3
Worawora SHS	66.7	46.4	63.9	73.3	75.0	52.8	68.3	63.9	26.9
Yagaba SHS	40.9	33.3	38.9	30.0	47.9	27.8	30.0	61.1	20.4
St Augustine SHS	58.3	40.5	66.7	50.0	68.8	47.2	63.3	66.7	27.8

Table A3.17 Teachers who are motivated and want to remain in the profession by region (%)

	Teachers who are motivated	Teachers who would like to remain
Bono	22.9	50.5
Ashanti	21.6	45.0
Greater Accra	21.3	49.3
Eastern	18.4	45.0
Central	17.0	49.7
Western North	16.7	58.6
Savannah	15.6	46.7
Bono East	15.0	40.0
Oti	14.3	64.3
Western	13.6	52.4
Volta	11.3	45.0
Upper East	10.7	52.7
Ahafo	6.7	43.3
North East	6.7	46.7
Northern	5.5	32.6
Upper West	3.5	45.6

Table A3.18 Teachers who are motivated and want to remain in the profession by school (%)

	Teachers who are motivated	Teachers who would like to remain
Lashibi Community Day SHS	53.3	53.9
Osei Adutwum SHS	53.3	60.0
Diamono SHS	40.0	46.7
Mpaha Community SHS	40.0	40.0
Tijjaniya SHS	40.0	40.0
Klo Agogo SHS	38.5	38.5
Ayanfuri SHS	33.3	13.3
Ejisuman SHS	33.3	40.0
Our Lady of Providence SHS	33.3	66.7
Prince of Peace Girls SHS	33.3	46.7
St. Stephen's Presby SHTS	33.3	33.3
Tawheed SHS	33.3	33.3

Adjen Kotoku SHS	26.7	60.0
Adugyama Community SHS	26.7	35.7
Aperade SHTS	26.7	42.9
Awutu Winton SHS	26.7	46.7
Ayirebi SHS	26.7	26.7
Bosomtwe Oyoko Community SHS	26.7	53.3
Diaso SHS	26.7	40.0
Nkenkansu Community SHS	26.7	40.0
Sunyani S.D.A SHS	26.7	66.7
St. Ann's Girls SHS	26.7	60.0
Taviefe Community SHS	26.7	46.7
Afife SHTS	20.0	26.7
Ahamansu Islamic SHS	20.0	86.7
Akokoaso SHTS	20.0	53.3
Awutu Bawjiase Community SHS	20.0	66.7
Bassa Community SHS	20.0	33.3
Boso SHTS	20.0	66.7
Esiama SHTS	20.0	57.1
Ibadur Rahman Academy SHS	20.0	46.7
Jukwa SHTS	20.0	86.7
Krobo Community SHS	20.0	46.7
Kwanwoma SHTS	20.0	60.0
Maame Krobo Community SHS	20.0	40.0
Navrongo SHS	20.0	60.0
Nkrankwanta Community SHS	20.0	53.3
Onwe SHS	20.0	73.3
St. Charles SHS	20.0	33.3
St. Joseph SHS	20.0	53.3
Nkawkaw St. Michael's SHS	20.0	53.3
Tongo SHTS	20.0	73.3
Ve Community SHS	20.0	80.0
Worawora SHS	20.0	53.3
Brakwa SHTS	15.4	21.4
Opoku Agyeman SHTS	14.3	28.6
Uthman Bin Afam SHS	14.3	61.5
Adankwaman SHS	13.3	66.7
Apeguso SHS	13.3	66.7
Jema SHS	13.3	46.7
Kofiase Adventist SHTS	13.3	46.7

Kwahu Tafo SHS	13.3	26.7
Manso-Amenfi Community Day SHS	13.3	64.3
Moree Community SHS	13.3	50.0
Nyinahin Catholic SHS	13.3	40.0
Mampong Presbyterian SHS	13.3	60.0
Saviour SHS	13.3	40.0
St. Michael's SHS	13.3	40.0
Tanyigbe SHS	13.3	73.3
Tema Manhean SHTS	13.3	40.0
Terchire SHS	13.3	53.3
St Augustine SHS	13.3	46.7
Kpone Community SHS	7.7	53.9
Nuru-Ameen Islamic SHS	7.1	21.4
Sawla SHS	7.1	57.1
Agate Community SHS	6.7	20.0
Amantin SHS	6.7	33.3
Birifoh SHS	6.7	53.3
Bonzo-Kaku SHS	6.7	40.0
Diaspora Girls' SHS	6.7	46.7
Han SHS	6.7	26.7
Kraboah-Coaltar Presby SHTS	6.7	33.3
Kurofa Methodist SHS	6.7	66.7
Kwaobaah Nyanoa Community SHS	6.7	46.2
Langbinsi SHTS	6.7	46.7
Leklebi SHS	6.7	21.4
O.L.L. Girls SHS	6.7	60.0
Odoben SHS	6.7	40.0
Kwamang Presbyterian SHTS	6.7	23.1
Senya SHS	6.7	53.3
St. John's Integrated SHTS	6.7	50.0
Tongor SHTS	6.7	60.0
Wapuli Community SHS	6.7	13.3
Yagaba SHS	6.7	46.7
Bimbilla SHS	6.3	35.7
Ogyeedom Community SHTS	5.9	58.8
Prampram SHS	5.9	41.2
Agotime SHS	0.0	35.7

Anlo Awomefia SHS	0.0	38.5
Business SHS	0.0	40.0
Jacobu SHTS	0.0	53.3
Kete Krachi SHTS	0.0	50.0
Northern Star SHS	0.0	40.0
Notre Dame Girls SHS	0.0	13.3
Notre Dame Seminary SHS	0.0	20.0
Sang Community Day SHS	0.0	50.0
Samuel Otu Presby SHS	0.0	33.3
St. Augustine SHTS	0.0	66.7
Tamale SHS	0.0	23.1
Tuna SHTS	0.0	43.8

Table A3.19 Proportion of teachers demonstrating NTS by school

school	Percentage
Tanyigbe SHS	87.5
Afife SHTS	75
Jacobu SHTS	75
Notre Dame Seminary SHS	75
Agotime SHS	62.5
Taviefe Community SHS	62.5
Uthman Bin Afam SHS	62.5
Krobo Community SHS	50
O.L.L. Girls SHS	50
Esiama SHTS	37.5
St. Charles SHS	37.5
Moree Community SHS	28.6
Tema Manhean SHTS	28.6
Klo Agogo SHS	12.5
Adankwaman SHS	0
Adjen Kotoku SHS	0
Anlo Awomefia SHS	0
Awutu Bawjiase Community SHS	0
Bassa Community SHS	0
Bimbilla SHS	0

Birifoh SHS	0
Business SHS	0
Diaspora Girls' SHS	0
Ejisuman SHS	0
Jukwa SHTS	0
Kete Krachi SHTS	0
Kofiase Adventist SHTS	0
Kraboaa-Coaltar Presby SHTS	0
Kwahu Tafo SHS	0
Lashibi Community Day SHS	0
Maame Krobo Community SHS	0
Manso-Amenfi Community Day SHS	0
Mpaha Community SHS	0
Navrongo SHS	0
Nkenkansu Community SHS	0
Northern Star SHS	0
Notre Dame Girls SHS	0
Nuru-Ameen Islamic SHS	0
Nyinahin Catholic SHS	0
Ogyeedom Community SHTS	0
Onwe SHS	0
Opoku Agyeman SHTS	0
Mampong Presbyterian SHS	0
Prince of Peace Girls SHS	0
Sunyani S.D.A SHS	0
St. Stephen's Presby SHTS	0
St. Ann's Girls SHS	0
Tamale SHS	0
Tawheed SHS	0
Terchire SHS	0

Table A3.20 Proportion of teachers demonstrating NTS, by region

Region	Percentage
Volta	57.5
Western	50

Upper East	41.7
Bono East	25
Northern	12.5
Greater Accra	8.7
Ashanti	7.5
Central	5.6
Eastern	1.8
Ahafo	0
Bono	0
Oti	0
Savannah	0
Upper West	0
Western North	0
North East	0

Table A3.21 Proportion of teachers demonstrating GESI, by region

Region	Percentage of teachers demonstrating GESI
Ahafo	0.0
Ashanti	8.8
Bono	0.0
Bono East	43.8
Central	11.1
Eastern	7.0
Greater Accra	17.4
Northern	16.7
Oti	0.0
Savannah	0.0
Upper East	30.4
Upper West	30.8
Volta	67.5
Western	87.5
Western North	0.0
North East	0.0

Table A3.22 Proportion of teachers demonstrating GESI, by school

School	Percentage
Afife SHTS	100.0
Tanyigbe SHS	100.0
Esiama SHTS	87.5
Jacobi SHTS	87.5
Krobo Community SHS	87.5
Uthman Bin Afam SHS	87.5
Northern Star SHS	80.0
Taviefe Community SHS	75.0
Agotime SHS	62.5
Moree Community SHS	57.1
O.L.L. Girls SHS	57.1
Tema Manhean SHTS	57.1
Klo Agogo SHS	37.5
Notre Dame Seminary SHS	37.5
Tamale SHS	37.5
Krboa-Coaltar Presby SHTS	12.5
St. Charles SHS	12.5
Adankwaman SHS	0.0
Adjen Kotoku SHS	0.0
Anlo Awomefia SHS	0.0
Awutu Bawjiase Community SHS	0.0
Bassa Community SHS	0.0
Bimbilla SHS	0.0
Birifoh SHS	0.0
Business SHS	0.0
Diaspora Girls' SHS	0.0
Ejisuman SHS	0.0
Jukwa SHTS	0.0
Kete Krachi SHTS	0.0
Kofiase Adventist SHTS	0.0
Kwahu Tafo SHS	0.0
Lashibi Community Day SHS	0.0
Maame Krobo Community SHS	0.0
Manso-Amenfi Community Day SHS	0.0
Mpaha Community SHS	0.0

Navrongo SHS	0.0
Nkenkansu Community SHS	0.0
Notre Dame Girls SHS	0.0
Nuru-Ameen Islamic SHS	0.0
Nyinahin Catholic SHS	0.0
Ogyeedom Community SHTS	0.0
Onwe SHS	0.0
Opoku Agyeman SHTS	0.0
Mampong Presbyterian SHS	0.0
Prince of Peace Girls SHS	0.0
Sunyani S.D.A SHS	0.0
St. Stephen's Presby SHTS	0.0
St. Ann's Girls SHS	0.0
Tawheed SHS	0.0
Terchire SHS	0.0

Table A3.23 Percentage of teachers demonstrating ICT by region

Region	Percentage of teachers demonstrating ICT
Bono East	43.8
Upper East	29.2
Central	25
Savannah	25
Volta	25
Greater Accra	21.7
Western	18.8
Bono	12.5
Western North	12.5
Eastern	12.3
Ashanti	10
Northern	4.2
Ahafo	0
Oti	0
Upper West	0
North East	0

Table A3.24 Teachers demonstrating ICT by school (%)

Schools	Teachers demonstrating ICT
Krobo Community SHS	75
Taviefe Community SHS	75
Jacobu SHTS	62.5
Notre Dame Seminary SHS	62.5
Ogyeedom Community SHTS	50
Tanyigbe SHS	50
Adankwaman SHS	37.5
Klo Agogo SHS	37.5
Lashibi Community Day SHS	37.5
Diaspora Girls' SHS	25
Mpaha Community SHS	25
O.L.L. Girls SHS	25
St. Ann's Girls SHS	25
St. Charles SHS	25
Tawheed SHS	25
Uthman Bin Afam SHS	25
Moree Community SHS	14.3
Tema Manhean SHTS	14.3
Adjen Kotoku SHS	12.5
Bassa Community SHS	12.5
Esiama SHTS	12.5
Jukwa SHTS	12.5
Manso-Amenfi Community Day SHS	12.5
Nyintahin Catholic SHS	12.5
Mampong Presbyterian SHS	12.5
Sunyani S.D.A SHS	12.5
St. Stephen's Presby SHTS	11.11
Afife SHTS	0
Agotime SHS	0
Anlo Awomefia SHS	0
Awutu Bawjiase Community SHS	0
Bimbilla SHS	0

Birifoh SHS	0
Business SHS	0
Ejisuman SHS	0
Kete Krachi SHTS	0
Kofiase Adventist SHTS	0
Kraboaa-Coaltar Presby SHTS	0
Kwahu Tafo SHS	0
Maame Krobo Community SHS	0
Navrongo SHS	0
Nkenkansu Community SHS	0
Northern Star SHS	0
Notre Dame Girls SHS	0
Nuru-Ameen Islamic SHS	0
Onwe SHS	0
Opoku Agyeman SHTS	0
Prince of Peace Girls SHS	0
Tamale SHS	0
Terchire SHS	0