T-TEL
Transforming Teaching, Education & Learning

Annual Baseline Survey

of

TRANSFORMING SENIOR HIGH SCHOOL EDUCATION, TEACHING AND LEARNING (T-SHEL) PROGRAMME, JAN 2022

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TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF BOXES

ACRONYMS AND ABBREVIATIONS

B.Ed.	Bachelor of Education
GES	Ghana Education Service
GESI	Gender Equality and Social Inclusion
ICT	Information and Communication Technology
NTECF	National Teacher Education Curriculum Framework
NTS	National Teachers' Standards
SEI	Secondary Education Institution
SEN	Special Education Needs
SHS	Senior High School
SIP	School Improvement Plan
SPPP	School Partnership Performance Plan
TEIs	Tertiary Education Institutions
TLMs	Teaching And Learning Materials
T-SHEL	Transforming Senior High School Education, Teaching and Learning
T-TEL	Transforming Teaching, Education and Learning
WASSCE	West African Senior Secondary Certificate Examination

	Indicator	T-SHEL survey (January 2022)
Teachers	**Output indicator 4.1**	
	Percentage of teachers in secondary education institutions displaying core competencies in the National Teachers' Standards (NTS).	• *Overall (3.3 percent)*
	Output indicator 4.2	
	Percentage of teachers in secondary education institutions using digital technology to enhance their teaching.	• *Overall (0.0)*
	Output indicator 4.3	
	Percentage of teachers in secondary education institutions who are motivated and want to remain in the profession.	• *Teachers who are motivated (9.6 percent)* • *Teachers who want to remain in the teaching profession (42.1 percent)*
	Output indicator 5.4	
	Percentage of teachers in secondary education institutions demonstrating GESI-responsive pedagogy.	• *Overall (8.7 percent)*
SEI Graduates	**Outcome indicator 2.1**	
	Percentage of graduates at end of secondary education who perceive that they are well-equipped with (a) subject knowledge and (b) 21st century skills needed to progress to further studies or successfully enter the world of work.	• *SEI graduates who perceive that they are well-equipped with subject knowledge (53.3 percent)* • *SEI graduates who perceive that they are well-equipped with 21st century skills (51.2 percent)*
SEI Students	**Outcome indicator 2.2**	
	Percentage of secondary education students by grade who demonstrate subject knowledge and 21st century skills.	• *Subject knowledge (45.7 percent)* NOTE: Applies to students who scored 50 to 100 percent i.e., We defined 'Proficiency' as a student test score with at least 50 percent of the items correct • *21st century skills (11.0 percent)* NOTE: We used the OECD benchmark to assess the students on 21st century skills. The minimum threshold for proficiency is '70'.

	Indicator	T-SHEL survey (January 2022)
Employers	**Outcome indicator 2.4**	
	Employers' perceptions of secondary education graduates' work-readiness.	• *Overall (31.9 percent)*
Tertiary education lectures	**Outcome indicator 2.5**	
	Tertiary education institutions (lecturers and senior management) perceptions of secondary education graduates' demonstration 21st century skills	• *Overall (11.3 percent)*
Secondary education institution	**Output indicator 5.1**	
	Percentage of schools providing i) career guidance ii) psycho-social and emotional counselling services iii) academic counselling iv) and have link with industry and tertiary institutions.	• *Career guidance (53.2 percent)* • *Psycho-social and emotional counselling services (4.3 percent)* • *Academic counselling (36.2 percent)* • *Link with industry (8.3 percent)* • *Link with tertiary institutions (12.4 percent)*
	Output indicator 5.2	
	Percentage of secondary education institutions with an inclusive, gender-sensitive environment for staff and students.	*Overall (36.2%)*
	Output indicator 5.3	
	Percentage of boards and senior management teams of secondary education institutions that demonstrate understanding and implementation of strategy on gender and inclusion.	*Overall (37.1 percent)*
	Output indicator 6.1	
	Number of boards and senior management teams of secondary education institutions that demonstrate understanding of their roles and responsibilities and can provide evidence of how they are discharging them.	*Overall (36.4 percent)*

1.0 INTRODUCTION

1.1 Background to the T-SHEL programme

Transforming Senior High School Education, Teaching and Learning (T-SHEL) is a Government of Ghana programme supported by the Mastercard Foundation and implemented by Transforming Teaching, Education & Learning (T-TEL) working closely with Ghana Education Service (GES). The programme aims to achieve an extensive and sustainable transformation in the quality and relevance of Ghana's secondary school system. This transformation seeks to reinforce the positive changes in access brought about by introducing the free senior high school (SHS) programme in 2017. In addition, the T-SHEL programme seeks to ensure that every Secondary education institution (SEI) graduate in Ghana is equipped with the subject knowledge and analytical and critical thinking skills needed to progress to further studies or successfully enter the world of work.

T-SHEL supports the government of Ghana to achieve this transformation by providing a holistic package of support to benefit more than 1.6 million SEI students between 2021 and 2026 with sustained benefits to an additional 600,000 new SEI students each year after the programme has ended.

The programme intervenes in five main programmatic areas:

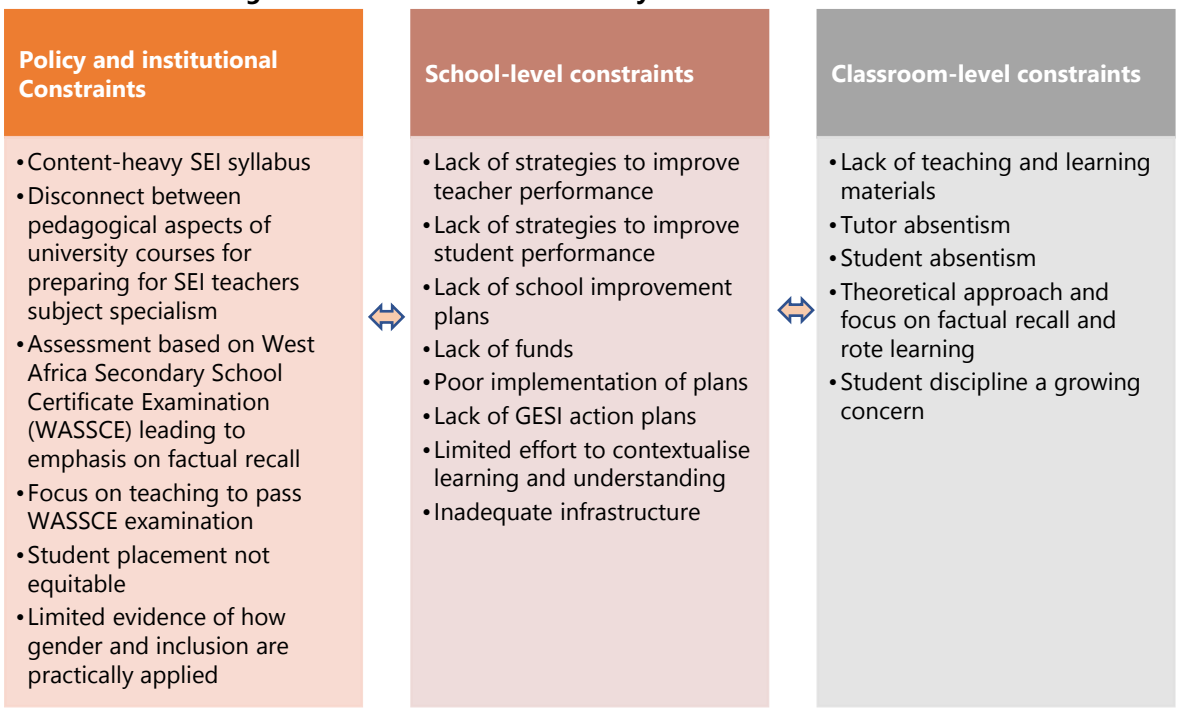
- **Teacher Education:** By ensuring that Ghana's five public teaching universities develop bachelor's degree and postgraduate certificate and new teacher education curricula aligned with the National Teachers' Standards (NTS) and National Teacher Education Curriculum Framework for all prospective SEI teachers. T-SHEL supports these five universities to ensure that they work effectively with Ghana's 46 public colleges of education to implement the new Bachelor of Education (B.Ed.) degree for prospective junior high school (JHS) teachers so that the first batch of 10,000 B.Ed. student teachers with JHS specialisms graduate successfully in September 2022. T-SHEL also seeks to work with the Ghana Tertiary Education Commission to develop a new teacher education qualification for the tertiary sector so that all lecturers and tutors in tertiary institutions involved in teacher education have a solid understanding of pedagogy and content knowledge.
- **Curriculum Development, Teaching, and Learning:** In collaboration with GES and the National Council for Curriculum and Assessment, the programme seeks to develop and implement a new Key Phase 5 curriculum for all core and elective SEI subjects that is aligned with the National Pre-Tertiary Curriculum Framework in all public SEIs.
- **Leadership for Learning:** Working with GES and the National Teaching Council, T-SHEL seeks to roll out a nationwide training programme with school boards and senior management teams across all public SEIs to provide them with the tools and techniques to operate effectively and provide strong leadership for learning whilst also laying the foundations for an effective national performance monitoring system.
- **Support to Quality Assurance and regulatory system:** The programme seeks to ensure that Ghana's national quality assurance and regulatory agencies can fulfil their mandates and enforce compliance with national approved policy documents and curricula, including the national Key Phase 5 Education Policy, new Teacher Education curricula within universities and the Key Phase 5 curriculum within SEIs.
- **Cross-cutting themes of gender equality and social inclusion (GESI), information and communication technology (ICT), and research and learning:** The T-SHEL programme works to ensure that: (a) GESI is adequately incorporated within the three programmatic areas so that Ghana has a responsive teacher-education and SEI system that promotes equality and inclusion; (b) appropriate and

affordable ICT options are available to support the delivery of teacher education and teaching and learning within SEIs; and, (c) agencies and institutions across the education system effectively communicate the nature and rationale for the programme's reforms.

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

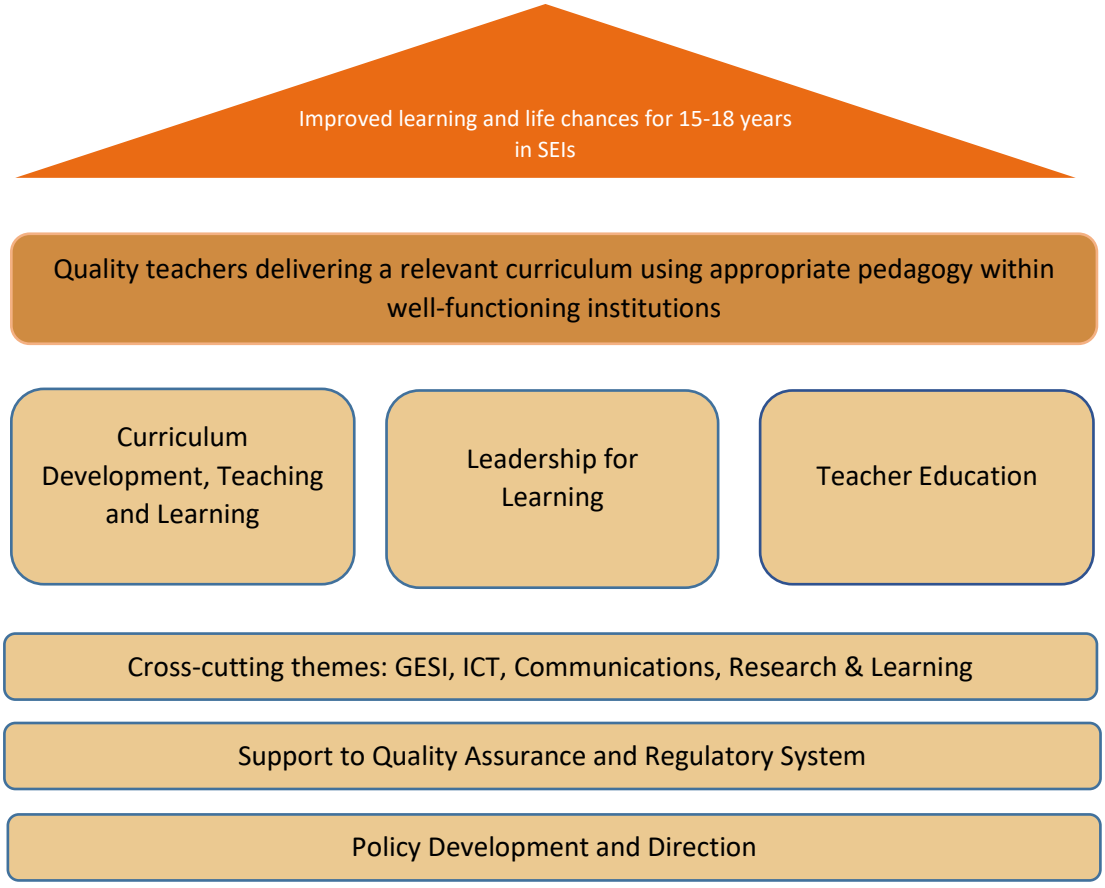
The programme theorizes that every SEI graduate in Ghana could be equipped with the subject knowledge, analytical and critical thinking skills needed to progress to further studies or successfully enter the world of work. However, there are constraints in the policy and institutional level, school-level,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

Figure 1.1 Constraints on secondary education institution students



In response to these assumptions, T-SHEL is designed as a complex, multicomponent programme with a wide range of intervention strategies. 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 T-SHEL's intervention address constraints



1.4 Purpose of the annual survey

The annual survey provides a baseline against which to measure progress in meeting T-SHEL's goals and objectives identified in its monitoring, evaluation, and learning (MEL) framework and data to inform policy and practice and to drive improvements in Ghana's SEIs. T-SHEL's framework is aligned with the Mastercard Foundation's Young Africa Works Impact Framework.

2.0 SURVEY METHODOLOGY

2.2 Sampling Design and Process

2.2.1 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, etc.) for the survey. Under this method, all public SEIs in Ghana were stratified by type (technical, vocational, and SHS), categories (A, B, C, and D)[1] and then the geographic location (Northern, Middle, and Southern zone), 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.

2.2.2 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, and design and building trade, etc.) and year (first and second-year students) to ensure that students pursuing various disciplines and at a different level of study were equally represented in the sample. By ensuring equal representation of students pursuing all disciplines in SEIs, the results would be representative of SEI students in Ghana. Twenty-four students split[2] between males and females (12 from each year of study (first and second year) were randomly sampled from each school to participate in the student assessment test. The Kish Grid[3] was used to support the sampling process to ensure that every student was given an equal chance to participate in the assessment test. In total, 4,721 students were assessed on subject knowledge (reading, mathematics, science) and 21st century skills. In addition, 1,955 students completed the student questionnaire as part of the teacher lesson observation sub-sample.

2.2.3 Sampling of SEI teachers

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 1,453 teachers from 100 SEIs.

[1] 'The secondary schools have been classified by the GES into categories based on a pre-agreed definition by both MoE and GES. Category 'A' schools are the best in the country, followed by the 'B' and then the "C" and the "D". This is based on their academic performance and their facilities. The list is being updated every year with some new schools joining different categories. This report uses such classification to ensure proportional representation of each school categories.

[2] Please note that the % of female students in the secondary schools as at 2020 is 49.5% (Source, EMIS).

[3] A kish grid is a way of randomly choosing survey respondents. The method avoids selection bias, which is usually a result of not using the correct procedures to choose respondents. The Kish 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 (Lewis, Beck et. al, 2003)

2.2.4 Sampling of SEI teachers for lesson observation

In a subsample of 50 randomly selected SEIs, 391 core subject teachers were randomly sampled from first- and second-year classes. These teachers were observed in the classroom. The sampling ensured 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. In addition, five students from an observed teachers' classrooms were randomly selected to participate in the student survey and key informant interviews. The students' questionnaires were self-administered to students.

2.2.5 Sampling process for the headteacher and senior management of SEI

In each sampled SEI, the headteacher and one senior management staff were interviewed to evaluate whether the leadership of SEIs understand their roles and responsibilities and can demonstrate with evidence the execution of these roles. In total, 194 people in this group were interviewed.

2.2.6 Sampling process for tertiary institution lecturers, tutors, and professors

The sampling frame for lecturers at tertiary education institutions (TEIs) (i.e., colleges of education, nursing colleges, traditional and technical universities) included all lecturers, tutors, and professors at these institutions who teach first-year (level 100) students. The survey was restricted to lecturers, tutors, and professors of first-year students because they are the subject of interest for this study. Thus, the perception survey sought to identify secondary education graduates' strengths and weaknesses in the three domains of 21st century skills: knowledge (such as literacy), competencies (such as critical thinking skills), and character qualities (such as discipline and integrity) from the perspective of lecturers. Online surveys were used to contact TEI lecturers because their institutions were on vacation at the time of the survey. The survey questionnaire was sent to TEI lecturers via email and social media platforms such as WhatsApp. In total, 768 TEI lecturers made up of 80 percent males and 20 percent females responded to the survey.

2.2.7 Sampling process for employers

The employer perception survey used the Ghana Statistical Service's sampling frame developed for its 2015 integrated business establishment survey. JMK utilized the sample distribution of the sectors in all the regions to develop proportional allocation for the interviews to be conducted. A sample of 1,068 employers was interviewed (face-to-face) across the country.

2.2.8 Sampling process for graduates of SEIs in Ghana

To measure the "percentage of graduates at the end of secondary education who perceive that they are well-equipped with (a) subject knowledge and (b) 21st century skills needed to progress to further studies or successfully enter the world of work", three categories of SEI graduates were interviewed. These are SEI graduates in tertiary institutions (first year), those that have entered the world of work, and those at home (yet to progress to further studies or successfully enter the world of work). The survey reached out to SEI graduates at home and those in tertiary institutions[4] through household survey in the communities and districts of sampled SEIs. The random-walk sampling method was used to sample secondary school graduates for interviews. Under this method, a central location within the district was identified as the random starting point. A pen was tossed to select the random route to follow. The number of housing structures was counted to generate a sampling interval. A random number was identified to ascertain the first household to commence the interview. This approach was repeated to ascertain the required sample size per sampled districts. Secondary school graduates who have entered the world of work were interviewed at their place of work.

[4] Tertiary institutions were on vacation during the data collection period.

Table 2.1 summarises the sample sizes for each of the stakeholders mentioned above.

Table 2.1 Summary of sample allocation for quantitative survey

Target stakeholder	Tool	Target	Actual	Response Rate
Headmaster/school management	Head teacher interview guide	200	194	97.0%
SEI teachers	Teacher Lessons Observation & Interview guide;	400	391	97.8%
	Teacher survey questionnaire	1,500	1,453	96.9%
SEI students	Student questionnaire	2,000	1,955	97.7%
	Student assessments Test	4,800	4,721	98.4%
Tertiary institution lecturers and tutors	Tertiary institution survey	1,000	768	76.8%
SEI graduates	SEI graduate survey questionnaire	2,300	2,360	102.0%
Employers	Employer survey questionnaire	1,000	1,068	106.8%
Total		**13,200**	**12,910**	**97.80%**

2.2.9 Other qualitative survey

To complement the quantitative data, JMK collected qualitative data to assess how and why expected changes are or are not occurring. JMK conducted qualitative data via focus group discussions (FGDs) and Key informant interviews (KIIs). These methods were carried out with the school boards, teachers, students, SEI graduates, and employers. Table 2.2 presents the sample distribution for the qualitative survey.

Table 2.2 Summary of sample allocation for qualitative data collection

Target stakeholder	Tool	Target	Actual	Response Rate
Board members	Board members interview guide	30	30	100%
SEI teachers	SEI Teacher interview guide	30	30	100%
SEI students	SEI student focus group discussion guide	30	30	100%
SEI graduates	SEI graduate interview guide	30	30	100%
Employers	Employer interview guide	30	30	100%
Total		**150**	**150**	**100%**

2.3 Development of survey instruments

Seventeen (17) data collection tools were developed for the baseline survey (See Box 2.1). In developing the tools, the team was guided by the T-SHEL MEL Framework, which contains the programme indicators, definitions, method of measurement, data collection and analysis. An extensive literature review was also conducted to explore comparable instruments that have been deployed in similar education studies in Ghana and elsewhere. The team also worked closely with the M&E Adviser and coordinator to develop, pilot, and refine the baseline data collection tools that not only measured the indicators but also 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 the T-SHEL 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. If a teacher achieves the required score for the indicator, he/she will be counted. It should be noted that the requisite composite scores reflect what is ideal and

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: Headteacher/Senior Management Interview Guide
Tool #3B: Board/Senior Management Interview Guide
Tool #4A: Employer Survey Questionnaire
Tool #4B: Employer Interview Guide
Tool #5A: SEI graduate Survey Questionnaire
Tool #5B SEI graduate Interview Guide
Tool #6A: TEI Tutors, Lecturers & Prof. Questionnaire
Tool #6B TEI Tutors. Lecturers & Prof. Interview Guide

required to substantively improve student learning (as opposed to a basic or minimum standard). Table 2.3 describes the baseline tools and the indicators to which they relate. (See Annex 2 for the final tools deployed for the survey).

Table 2.3 Overview of baseline tools and related indicators

Results Level	Result	Indicators	Tools
Outcome 2	Students have improved equitable access to quality secondary education and acquire the 21st century skills and competencies needed for lifelong learning and employability	2.1 % of graduates at end of secondary education who perceive that they are well-equipped with the (a) subject knowledge and (b) 21st century skills needed to progress to further studies or successfully enter the world of work.	Tool #5A: SEI graduate Survey Questionnaire Tool #5B SEI graduate Interview Guide
		2.2 % of secondary education students by grade who demonstrate subject knowledge and 21st century skills.	Tool #1A: Reading Literacy Assessment Tool #1B: Mathematics Literacy Assessment Tool #1C: Science Literacy Assessment Tool #1D: 21st Century Skills Assessment
		2.4 Employers' perceptions of secondary education graduates' work readiness.	Tool #4A: Employer Survey Questionnaire Tool #4B: Employer Interview Guide
		2.5 Tertiary education institutions perceptions of secondary education graduates' demonstration 21st century skills	Tool #6: TEI Tutors, Lecturers & Prof. Questionnaire Tool #6B TEI Tutors, Lecturers & Prof. Interview Guide
Output 4	Teaching, learning and professional development	4.1 % of teachers in secondary education institutions displaying core competencies in the NTS.	Tool #2A: SEI Teacher Lesson Observation Tool #2B: SEI Teacher Follow-up Interview Guide Tool#2C: SEI Student Questionnaire
		4.2 % of teachers in secondary education institutions using digital technology to enhance their teaching.	
		4.3 % of teachers who are motivated and want to remain in the profession.	Tool #2D: SEI Teacher Survey Questionnaire Tool #2E: Teacher Interview Guide
Output 5	Guidance, counselling, gender, and inclusion	5.1 % of schools providing i) career guidance ii) psycho-social and emotional counselling services iii) academic counselling iv) and have link with industry and tertiary institutions.	Tool #3A: Headteacher/Senior Management Interview Guide Tool #3B Board/Senior Management Interview Guide Tool#2C: SEI Student Questionnaire
		5.2 % of secondary education institutions with an inclusive, gender-sensitive environment for staff and students.	
		5.3 % of boards and senior management teams of secondary education institutions that demonstrate understanding and implementation of strategy on gender and inclusion.	Tool #3A: Headteacher/Senior Management Interview Guide Tool #3B Board/Senior Management Interview Guide

Results Level	Result	Indicators	Tools
		5.4 The percentage of teachers at secondary education institution demonstrating GESI-responsive pedagogy.	Tool #2A: SEI Teacher Lesson Observation Tool #2B: SEI Teacher Follow-up Interview Guide Tool#2C: SEI Student Questionnaire
Output 6	Leadership, management & evidence-based decision making	6.1 Number of boards and senior management teams of secondary education institutions that demonstrate understanding of their roles and responsibilities and can provide evidence of how they are discharging them.	Tool #3A: Headteacher/Senior Management Interview Guide Tool #3B Board/Senior Management Interview Guide

2.4 Pre-testing of tools

The student assessment tools (namely, reading, mathematics, literacy and 21st century skills) were pre-tested in category A, B, and C schools in Greater Accra region to examine the students' responses to individual test items (questions), to assess the quality of those items and the test. Results of the pre-test (please see annex 2) were used to revise the student assessment tools. In addition, other instruments such as the teacher survey questionnaire, headteacher survey questionnaire, SEI graduate and TEI tutors' & lecturers' questionnaires were pre-tested with a cross-section of target respondents and revised before final deployment. The lessons observation and teacher interview guides had been used in several T-TEL studies and were therefore not subjected to additional pre-testing.

After the pre-test, the tools were revised to improve clarity and implementation, and the revised tools were again shared with T-TEL key advisers for their technical comments and inputs. The final pre-test report, including the final survey tools, have been attached to the annex.

2.5 Data quality control

Five field supervisors randomly visited the data-collection team 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 and 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 observation and interviews conducted by the supervisor with the interview records to compute interrater reliability tests. A Kappa model generated 87.8 percent agreement for the tutor 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 that the respective enumerator had collected

2.6 Data management and analysis

The data collected was imported from the SurveyCTO platform and analyzed using Stata version software. A Do File was computed to store the syntax of the analysis, which will also be applied at the follow-up survey 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, JMK conducted a multivariate analysis 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 outcomes. Qualitative data analysis was conducted using thematic and content analysis to explain why desired changes have or have not occurred. NVIVO software was used to analyze the qualitative data.

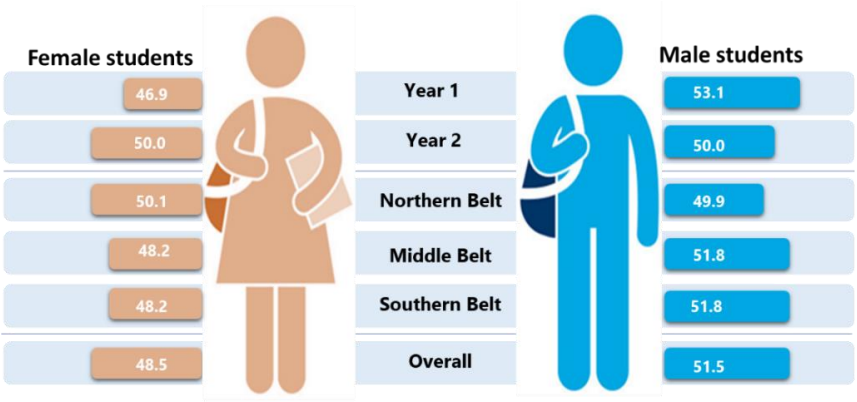
3.0 RESULTS

3.1 Demographic profile of key stakeholders

3.1.1 Profile of SEI students

The study assessed 4,721 students on reading, mathematics, science, and 21st century skills. Slightly over half are male (see figure 3.1). Across regions, male students in the middle and southern belts are slightly higher than female students.

Figure 3.1 Sex distribution SEI students who took part in the assessment



3.1.2 Profile of SEI graduate students

The data further shows that 52.2 percent of SEI graduates are males, whereas 47.8 percent are females.

About a third of SEI graduates have progressed to further study, 35.4 percent were at home, and 30.8 percent have entered the world of work. A similar trend is observed across sex distribution (table 3.1).

Table 3.1 Category of SEI graduates interviewed

	Male	Female	Total
SEI graduates in School	32.4	35.3	33.8
SEI graduates at home	35.9	34.8	35.4
SEI graduates employed	31.7	29.9	30.8
Overall	100.0	100.0	100.0
Total (N)	**1,231**	**1,129**	**2,360**

The results further show that the majority of SEI graduates surveyed studied general arts (40.7 percent), followed by home economics (16.1 percent), Science (16. Percent), and business (13.0 percent). About 6.6 percent of SEI graduates also studied visual arts, and 5.1 percent studied technical/vocational studies.

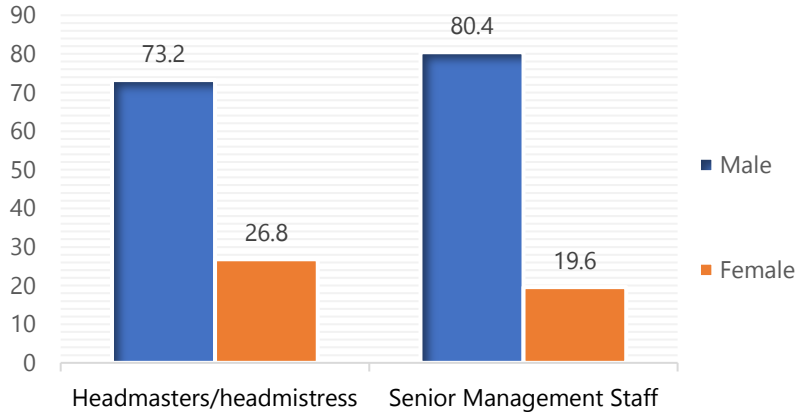
3.1.3 Profile of SEI teachers

The results show that the majority (43.4 percent) of teachers surveyed have been teaching for more than 10 years, with slightly more males (43.6 percent) than females (42.6 percent). This is followed by 30.4 percent of teachers who have been in the teaching profession for less than 5 years, and 26.3 percent of teachers have been teaching for 5 to 10 years. A slightly higher proportion of female teachers (32.0 percent) have been teaching for less than 5 years as compared with male teachers (29.7 percent).

3.1.4 Profile of headteachers and senior management staff

Figure 3.2 shows the sex distribution of headteachers, and senior management staff interviewed. Out of the 97 schools surveyed, the majority (73.2 percent) of the heads of schools were male, with the remaining 26.8 percent constituting females.

Figure 3.2 Gender distribution of Headmasters and Senior management staff



3.1.5 Profile of employers

The survey engaged 1,069 employers to ascertain their perception of the work readiness of SEI graduates to enter and succeed in the world of work. The results show that out of the number of employers interviewed, the majority (68.7 percent) were males, with females constituting 31.3 percent. Also, 96 percent of employers were in the private-for-profit sector while the remaining were in the government and private-non-profit sector.

3.1.6 Profile of tertiary education lecturers and tutors

Concerning sex distribution of TEI stakeholders, the majority (80.1 percent) are males, and 19.9 percent are females. With respect to the TEIs, the results show that majority (48.8 percent) of institutions were Public Colleges of Education, followed by Traditional Public Universities (35.2 percent), Public Nursing/Health Institutions (7.4 percent), Technical Public Universities (6 percent), and Private Tertiary Institutions (2.6 percent).

3.2 SEI student outcome indicator results

3.2.1 Student assessment performance

The results of students' assessments in reading, mathematics, science and 21st century skills are shown in table 3.2. The results are presented using the mean scores. We also defined the competency and proficiency cut-off scores in terms of percentage correct[5]. We defined 'Proficiency[6]' as a student test score with at least 50 percent of the items correct. 'Minimum Competency' is defined as a student with at least 40-49 percent of the items correct (figure 3.3).

Overall, students obtained an average score of 46.9 percent for subject knowledge (i.e., reading, mathematics and science).

Table 3.2 Student performance on assessments

Assessments	Mean	Standard deviation	Highest score	Lowest score
Reading	47.5	13.0	78	8
Science	46.2	12.1	76	12
Mathematics	47.1	13.4	83	8
Subject knowledge	46.9	12.9	79	9.3

Table 3.3 presents the average scores by demographic characteristics of students in SEI. The notable observation from the result shows that male students obtained significantly higher mean scores in mathematics and science than females.

The findings further reveal a notable trend regarding students' performance in mixed-sex and single-sex schools. The results show that students in mixed-sex schools obtained higher average scores in reading and science compared to their counterparts in single-sex schools.

Further analysis on the classification of schools shows that students in class A schools obtained higher average scores in reading and science than their counterparts in other school classifications. Of note is the difference of 9 percentage points between students in class A schools and their cohort in the other class.

Across geographical zones, the results show that students in the southern zones achieved higher average scores in reading and mathematics relative to their cohorts in the middle and northern zones.

Further analysis such as correlation among the domains etc. can be found in table 3.43 at Annex 3.2. Also, quartile analysis of results is provided in table 3.45 at annex 3.2

[5] We reviewed work done by the MoE on the NEA assessments (2016 to 2018).

6 The value of creating cut-off scores to define competency and proficiency is that they allow us to group students into meaningful categories. The limitation of cut-off scores is that they separate scores that are not very different (i.e., the scores on each side of a cut-off score) into categories that are labelled as being very different. For example, on this assessment, a student with a score of 39 percent is considered "below minimum competency," and a student with a score of 40 percent is considered to exhibit "minimum competency." The converse is also true: cut-off scores may group students with very different scores into the same competency or proficiency category. For example, a student with a score of zero percent and a student with a score of 39 percent are both considered "below minimum competency." To ensure that there is targeted intervention for students, policymakers need more detail than the categories of "below minimum competency," "minimum competency," and "proficiency". This report therefore presents further analysis through average scores, quartiles and regression models.

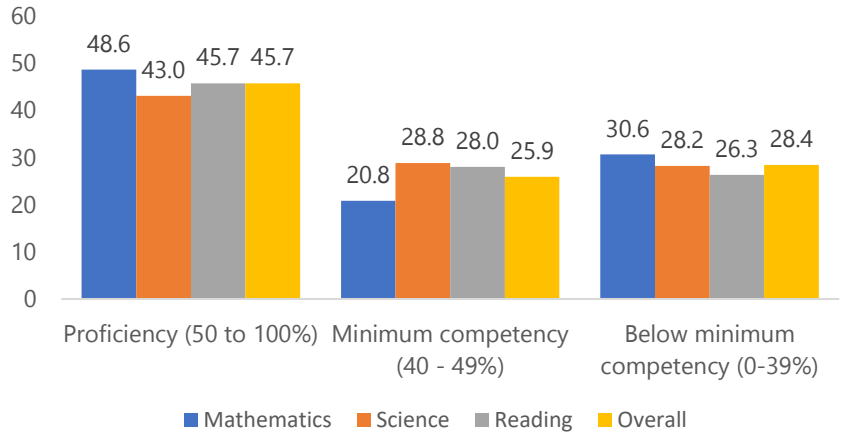
Table 3.3 Students' mean assessment scores by demographic characteristics

	Reading	Mathematics	Science
Sex			
Male	46.86	47.92*	47.31*
Female	48.17	46.20	45.04
Level of student			
Year 1	47.60	46.75	45.61
Year 2	47.39	47.40	46.75
School sex			
Mixed sex	46.83	47.12	45.26
Single sex	56.07*	46.94	53.46*
School classification			
Class A	55.94*	48.87	53.46*
Class B	46.85	47.07	45.85
Class C	46.54	46.81	44.97
Region			
Northern belt	41.71	45.54	46.10
Middle belt	47.54*	46.10	45.76
Southern belt	50.19*	48.98*	46.88

*p≤0.05

Figure 3.3 presents the students assessment result in context (proficiency and competency of the students). The results show that 48.6 percent of the students achieved proficiency in mathematics, 43.0 percent achieved proficiency in science and 45.7 percent achieved proficiency in reading. Overall, 45.7 percent of the students achieved proficiency in subject knowledge.

Figure 3.3 Minimum competency and proficiency results: mathematics, science and reading



Using the criteria for this assessment, 26.3 percent of the students failed to achieve minimum competency in reading, 28.2 percent failed to achieve minimum competency in science, and 30.6 percent failed to achieve minimum competency in mathematics.

Table 3.4 Minimum competency and proficiency results in mathematics, science and reading

	Subject Knowledge			
	Mathematics	*Science*	*Reading*	*Overall*
Proficiency (50-100 percent)	48.6	43.0	45.7	45.7
Minimum competency (40- 49 percent)	20.8	28.8	28.0	25.9
Below Minimum competency (0-39 percent)	30.6	28.2	26.3	28.4

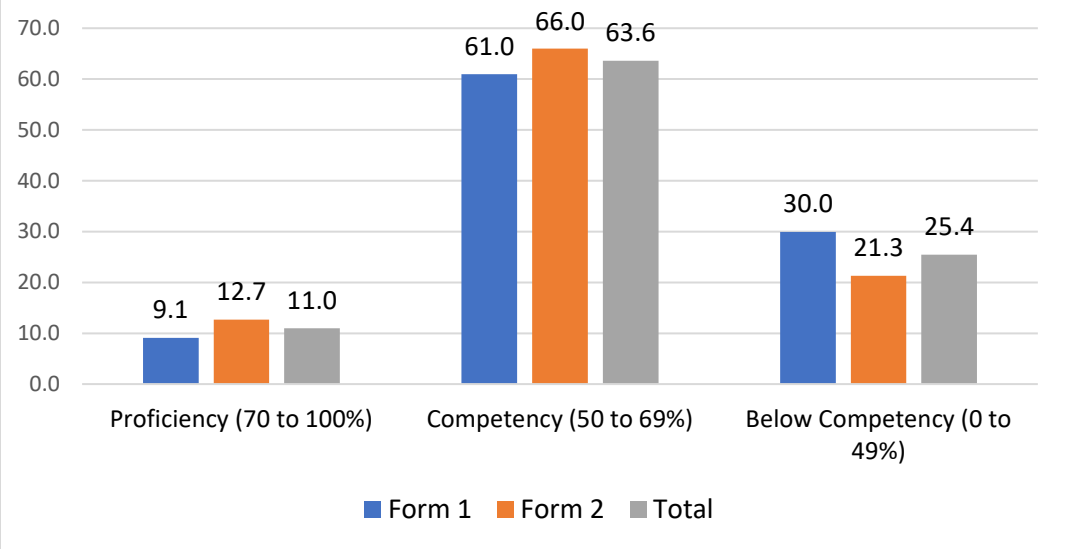
3.2.2 Evaluation of 21st century skills assessment

Currently, 21st century skills are not assessed in Ghana. We therefore aligned the 21st century skill assessment to the Organisation for Economic Co-operation and Development (OECD[7]) Framework (2015). The study developed 50 assessment questions for the 21st century skills from nine domains, including

- 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

The OECD average performance was set at 70 percent[8] across OECD countries[9]. This established the benchmark against which each country's 21st century skills were compared. Computing the proficiency (figure 3.4), we found that 11.0 percent of the students met the OECD criterion for proficiency across level. Majority (63.6 percent) met the OECD criterion for competency and twenty-five percent of the students did not achieve minimum competency.

Figure 3.4 21st century skills proficiency of students, by level of student (%)



[7] 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. Details can be obtained here (https://www.oecd.org/pisa/pisaproducts/Draft%20PISA%202015%20Collaborative%20Problem%20Solving%20Framework%20.pdf)

[8] https://www.oecd.org/pisa/pisa-for-development/pisafordevelopment2018technicalreport/PISA-D%20TR%20Chapter%2015%20-%20Proficiency%20Scale%20Construction%20-%20final.pdf

[9] Please note that Ghana is not yet a member of OECD countries.

Table 3.5 provides the findings of the domain analysis. The results show that students performed best on "discipline and integrity" followed by items on "responsible citizenship'. Of note in the results is the significant low average scores (32.0 percent) on "critical thinking and problem solving". Students also obtained comparatively low mean scores on questions related to "financial literacy and entrepreneurship".

Table 3.5 21st century domain analysis by the level of students (mean percent)

Domain	Year 1	Year 2	Overall mean
Discipline and Integrity	75.8	80.7*	78.3
Responsible citizenship	64.3	69.1*	66.8
Cultural identity, civic literacy, and global citizenship	62.1	65.8*	64.0
ICT and digital literacy	62.2	61.8	62.0
Self-discipline	59.9	63.5*	61.8
Adaptability and resourcefulness	56.3	61.6*	59.1
Leadership	52.7	57.9*	55.4
Financial literacy and entrepreneurship	44.5	46.6*	45.6
Critical thinking and problem solving	31.9	32.2	32.0

*p≤0.05

The survey examined students' performance using the OECD criteria and key demographic characteristics (table 3.6). The results show a significant relationship between the level of students and performance in the 21st century skills. Year two students performed relatively well compared to their cohort in the first year. Similarly, students in class A schools performed relatively better than their counterparts in class B and C. Also, students in single-sex schools performed relatively better than their cohort in mixed-sex schools.

Table 3.6 Student performance in 21st century skills by OECD criteria and demographic characteristics

	Proficiency (70-100 percent)	Competency (50 to 69 percent)	Below Competency (0 to 49 percent)
Sex			
Male	11.4	65.5	23.1
Female	10.5	61.7	27.7
Level of student			
Year 1	9.1	61.0	30.0
Year2	12.7*	66.0	21.3
School class			
Class A	29.6*	58.3	12.1
Class B	10.9	67.1	22.1
Class C	7.5	62.9	29.6
School sex			
Mixed-sex school	9.7	63.5	26.8
Single-sex school	27.1*	64.7	8.2

*p≤0.05

Table 3.7 presents the output of a multiple linear regression model in which students' scores were used as the dependent variable. Student and school demographic characteristics are the regressors. Based on the output results, female students obtained 1.6 percent fewer scores than male students when other independent variables were controlled. Also, students in their second year got about 3 percent higher scores than those in their first year. For the age of the students, the findings show that a unit increase in the student's age leads to a reduction in the scores obtained by about 1.5 percent.

Students in class B and C schools had 5 percent lower scores than students in class A schools. Furthermore, students in mixed-sex schools had 3 percent higher scores than students in single-sex schools.

Table 3.7 Output of multiple linear regression of 21st century skills assessment

Characteristics	Coefficient	P-value	95% confidence interval
Sex of student			
Male	Reference		
Female	-1.558	0.018	-2.845, -0.271
Level of student			
Year 1	Reference		
Year 2	3.096	0.000	2.466, 5.142
Age	-1.495	0.000	-2.044, 0-.947
School classification			
Class A	Reference		
Class B	-5.659	0.000	-8.200, -3.118
Class C	-5-027	0.000	-7.441, -2.613
School sex			
Mixed-sex school	3.096	0.034	0.231, 5.962
Single-sex school	Reference		

3.2.3 Evaluation of reading assessment

The study developed the reading assessment questions along three dimensions. These include

- Text (the range and format of the reading materials)
- Cognitive process (the type of reading process involved)
- Situations (the range of contexts for which the text was constructed)

The study developed questions for each dimension[10], as shown in table 3.8. Based on the results, students had relatively low average scores (29.71 percent) on "Narration" and "Argumentative" items within the **Text** dimension. Similarly, the study recorded low average scores (20.61 percent) for "Personal" items within the **Situations** dimension.

Table 3.8 also disaggregate the result by the level of difficulty (cognitive demand) for the reading assessment, students obtained a higher average for questions with a lower difficulty level.

Table 3.8 Item analysis of reading literacy assessment (mean percent)

Domain	Year 1	Year 2	Overall mean
Text type			
Description	69.1	69.8	69.3
Narration	33.3	29.2	31.2
Argumentative	30.9	28.7	29.7
Instruction	43.0	45.3	44.0
Cognitive process			
Access and retrieve	65.6	65.4	65.3
Integrate and interpret	57.5	57.5	57.3
Reflect and evaluate	50.7	49.7	50.1
Situation			
Personal	20.9	20.5	20.6
Public	60.2	60.4	60.1
Cognitive demand			
Low	65.2	64.4	64.6
Medium	58.4	58.4	58.2
High	54.8	56.5	55.5

Table 3.9 evaluates students' reading literacy performance on the grading scale against key demographic characteristics. Students in class A schools performed relatively better than their cohort in class B and C schools. Again, students in single sex-schools recorded better results compared to mixed sex-schools.

[10] The reading literacy assessment framework and question items can be found in annex 2.

Table 3.9 Minimum competency and proficiency results in reading literacy assessment by demographic characteristics

	Proficiency (50%-100 percent)	Minimum competency (40% to 49 percent)	Below minimum competency (0% to 39 percent)
Sex			
Male	44.9	27.2	27.9
Female	46.6	28.9	24.5
Level of student			
Year 1	46.1	27.4	26.5
Year2	45.3	28.7	26.0
School class			
Class A	66.6*	21.3	12.0
Class B	44.5	25.1	30.5
Class C	43.2	30.4	26.4
School sex			
Mixed-sex school	44.1	28.4	27.5
Single-sex school	65.4*	23.8	10.7

*p≤0.05

Table 3.10 presents the output of multiple linear regression where the scores obtained by students were used as the dependent variable and the demographic characteristics used as regressors. Female students received about 1.2 percent higher scores than male students when all other independent variables were controlled. Also, students in second year had about 6.7 percent lower scores than their counterparts in first year.

The findings show that a unit increase in a student's age leads to a reduction in the scores obtained by about 1 percent.

Analysis based on schools' demographic characteristics show that students in class B and C schools had about 6.7 and 5.5 percent lower scores than students in class A schools. Also, students in single-sex schools had about 4.6 percent higher scores than students in mixed-sex schools.

Table 3.10 Output of multiple linear regression of reading assessment

Characteristics	Coefficient	P-value	95% confidence interval
Sex of student			
Male	Reference		
Female	1.198	0.102	-0.236, 2.634
Level of student			
Year 1	Reference		
Year 2	-6.668	0.000	-9.903, -3.433
Age	-0.872	0.003	-1.438, -0.305
School classification			
Class A	Reference		
Class B	-6.668	0.000	-9.903, -3.433
Class C	-5.487	0.001	-8.620, -2.354
School Sex			
Mixed sex	Reference		
Single sex	4.618	0.008	1.185, 8.051

3.2.4 Evaluation of mathematics assessment

The study developed the research questions from four domains for the mathematics assessment[11]. These include

- Content area (quantity, space, and shape, change and relationships, uncertainty, and data)
- Cognitive domain (low, medium, high)
- Contexts (personal, occupational, societal, and scientific)
- Competencies and processes (formulating situations mathematically, employing mathematical concepts, facts, procedures and reasoning, interpreting, applying, and evaluating mathematical outcomes)

Table 3.11 presents the results from the item analysis within the domains of the mathematics assessment. Based on the results, we observe a low score for "Quantity" within the Content area. Also, the findings reveal that in the **Cognitive demand** domain, students obtained lower scores as the level of difficulty increased. Lastly, within **Contexts** and **Competencies**, the lowest scores were recorded for "Scientific" and "Formulating".

Table 3.11 Item analysis of mathematics literacy assessment (mean percent)

Domain	Year 1	Year 2	Overall
Content Area			
Quantity	37.5	37.4	37.4
Space and Shape	47.8	50.1	49.0
Change and Relationship	48.0	48.9	48.5
Uncertainty and Data	48.6	50.5	49.6
Cognitive Domain			
Low	52.8	54.1	53.5
Medium	31.5	33.3	32.4
High	24.5	25.6	25.1
Contexts			
Personal	48.9	49.9	49.4
Occupational	39.7	39.0	39.3
Societal	65.3	66.7	66.1
Scientific	34.1	36.7	35.5
Competencies/Processes			
Formulating situations mathematically	34.1	36.7	35.5
Employing mathematical concepts, facts, procedures, and reasoning	42.3	44.2	43.3
Interpreting, applying, and evaluating mathematical outcomes	51.5	53.0	52.3

Further analysis of students' performance using the grading scale shows that, unlike the other subjects, males recorded relatively higher grades in mathematics than their female cohort.

[11] The mathematics assessment framework and question items can be found in annex 2.

Table 3.12 Minimum competency and proficiency results in mathematics literacy assessment by demographic characteristics

	Proficiency (50%-100 percent)	Minimum competency (40% to 49 percent)	Below minimum competency (0% to 39 percent)
Sex			
Male	49.9	22.6	27.5
Female	47.2	18.9	34.0
Year 1	48.0	19.7	32.3
Year2	49.0	21.9	29.1
School class			
Class A	54.1*	18.9	27.1
Class B	47.9	20.5	31.7
Class C	47.8	21.5	30.7
School sex			
Mixed-sex school	48.5	21.2	30.4
Single-sex school	48.2	18.1	33.7

*p≤0.05

The multiple linear regression reveals that females obtained about 1.8 percent lower scores than males. Also, students in second year had about 1.5 percent higher scores than their counterparts in first year.

Modelling by the age of the students, the findings further show that a unit increase in a student's age leads to a reduction in the scores obtained by about 1 percent.

Analysis based on schools' demographic characteristics show that students in class B and C schools had about 2.4 and 2.6 percent lower scores than students in class A schools. Also, students in single-sex schools obtained about 2.3 percent lower scores than students in mixed-sex schools. And lastly, students in the northern belt had less than 1 percent lower scores than students in the middle belt, while students in the southern belt had about 2.8 percent higher scores than students in the middle belt. (See table 3.13)

Table 3.13 Output of multiple linear regression of mathematics assessment

Characteristics	Coefficient	P-value	95% confidence interval
Sex of student			
Male	Reference		
Female	-1.815	0.022	3.368, -0.261
Level of student			
Year 1	Reference		
Year 2	1.454	0.081	-0.178, 3.086
Age	-0.711	0.023	-1.322, -0.099
School classification			
Class A	Reference		
Class B	-2.401	0.143	-5.616, 0.813
Class C	-2.649	0.089	-5.708, 0.408
School Sex			
Mixed sex	Reference		
Single sex	-2.298	0.206	-5.859, 1.262

3.2.5 Evaluation of science assessment

The study developed the science assessment test questions[12] from the 2018 Programme for International Student Assessment (PISA)[13] science framework. The domains covered in the science assessment test include

- Context (Personal such as self, family, and peer groups, local/national/social, global such as 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 science, content of science such as physical systems, living systems, technology systems, earth and space science, knowledge about science such as scientific inquiry and scientific explanations)

Based on the results shown in table 3.14, the lowest average score was recorded for "knowledge about science" (46.10 percent) within the **Knowledge domain.**

Table 3.14 Item analysis of science literacy assessment (mean percent)

Domain	Year 1	Year 2	Overall mean
Contexts			
Local/National/Social	76.7	79.4	78.1
Global (Life across the world)	67.1	67.9	67.6
Competencies			
Identify scientifically oriented issues	56.5	58.0	57.3
Explain phenomena scientifically	54.0	55.6	54.8
Use scientific evidence	47.6	50.9	49.3
Knowledge domains			
Knowledge of science (physical, living and technology systems, etc.)	58.4	60.0	59.3
Knowledge about science (scientific inquiry and explanations)	45.5	46.6	46.1
Cognitive demand			
Low	69.7	71.1	70.4
Medium	53.5	55.2	54.4

Table 3.15 evaluates students' performance in science literacy assessment on the grading scale. The results reveal that consistent with trends observed in this study, students in class A schools performed relatively better than

[12] The science assessment framework and question items can be found in annex 2.

13 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. Details can be obtained here (https://www.oecd-ilibrary.org/docserver/f30da688-en.pdf?expires=1643788437&id=id&accname=guest&checksum=8210A816D0B9F6A25F9CE21ADEFB06D4)

their cohort in the other categories. Similarly, students in single sex schools performed relatively better than their counterpart in mixed-sex schools.

Table 3.15 Minimum competency and proficiency results in science literacy assessment by demographic characteristics

	Proficiency (50%-100 percent)	Minimum competency (40% to 49 percent)	Below minimum competency (0% to 39 percent)
Sex			
Male	46.3	29.7	24.0
Female	39.4	27.9	32.8
Year 1	41.1	29.5	29.5
Year2	44.8	28.3	27.0
School class			
Class A	70.0*	17.1	12.9
Class B	41.4	28.9	29.7
Class C	38.4	31.2	30.4
School sex			
Mixed-sex school	39.3	30.4	30.2
Single-sex school	60.0*	17.1	12.9

*p≤0.05

Table 3.16 shows the results of the regression analysis for the science assessment. Females obtained about 2.6 percent lower scores than males. Also, students in second year achieved about 2.3 percent higher scores than students in first year.

Analysis by age also shows that a unit increase in a student's age reduced the scores obtained by about 1.4 percent. Analysis based on schools' demographic characteristics shows that single-sex schools obtained about 7.7 percent higher scores than students in mixed-sex schools, a trend observed in other subject areas.

Table 3.16 Output of multiple linear regression of science assessment

Characteristics	Coefficient	P-value	95% confidence interval
Sex of student			
Male	Reference		
Female	-2.632	0.000	-3.978, -1.286
Level of student			
Year 1	Reference		
Year 2	2.310	0.001	0.896, 3.724
Age	-1.420	0.000	-1.966, -0.874
School classification			
Class A	Reference		
Class B	0.124	0.873	-1.401, 1.650
Class C	0.856	0.227	
School Sex			
Mixed sex	Reference		
Single sex	7.658	0.000	5.517, 9.798

3.3 Results of SEI graduates

Outcome indicator: Percentage of secondary education graduates who perceive that they are well-equipped with the (a) subject knowledge and (b) 21st century skills needed to progress to further studies or successfully enter the world of work

One of the T-SHEL indicators assesses the extent to which graduates of SEIs perceive they are well-equipped with the subject knowledge and 21st century skills needed to progress to further studies or to enter the world of work. In assessing perceptions of SEI graduates, the survey asked them to indicate their level of agreement with skills that were taught. The skills areas evaluated include **Foundational Knowledge**[14], **Competencies**[15], and **Character Qualities**[16].

The study developed a rubric to determine the proportion of SEI graduates who satisfy the requirement of the indicator. A mean composite score from the 5-point Likert scale was computed based on the rubric. A SEI graduate who obtains a minimum of 4.00 out of 5.00 (80 percent) is recognized as meeting the criteria for the indicator.

Table 3.17 provides details of the proportion of SEI graduates who perceived that they are well-equipped with the subject knowledge and 21st century skills needed to progress to further studies or enter the world of work. About half of all SEI graduates perceived they are well-equipped with the subject knowledge (53.3 percent) and 21st century skills (51.2 percent). A higher proportion of SEI graduate students in tertiary institutions (year 1 students) and those employed (world of work) perceived they are well-equipped than SEI graduates at home (yet to progress to further studies or successfully enter the world of work). This trend is similar when the results are observed based on the sex distribution.

Table 3.17 Proportion of SEI graduates who perceive they are well-equipped with subject knowledge and 21st century skills (%)

	Subject knowledge	21st century skills	Overall
SEI graduates in school	**55.8**	**50.5**	**53.2**
Male	58.2	53.6	55.9
Female	53.4	47.4	50.4
SEI graduates at home	**49.2**	**48.3**	**48.8**
Male	49.8	48.4	49.1
Female	48.6	48.1	48.4
SEI graduates employed	**55.3**	**55.4**	**55.4**
Male	58.0	58.2	58.1
Female	52.2	52.2	52.2
Total	**53.3**	**51.2**	**52.3**

[14] This includes scientific literacy (science, technology, engineering, agric), numeracy (mathematic), ICT and digital literacy, financial literacy and entrepreneurial skills, cultural and civic literacy, and values.

15 This includes critical thinking and problem solving, innovation, creativity, collaboration, and communication.

16 This includes discipline, integrity, self-directed learning, self-confidence, adaptability, resourcefulness, leadership, and responsible citizenship.

Figure 3.5 also provides the analysis of results on the domains of the 21st century skills. As shown in the figure, majority of the SEI graduates scored significantly higher on character qualities than foundational knowledge.

Figure 3.5 SEI graduates who perceive they are well-equipped, by domains of 21st century skills (%)

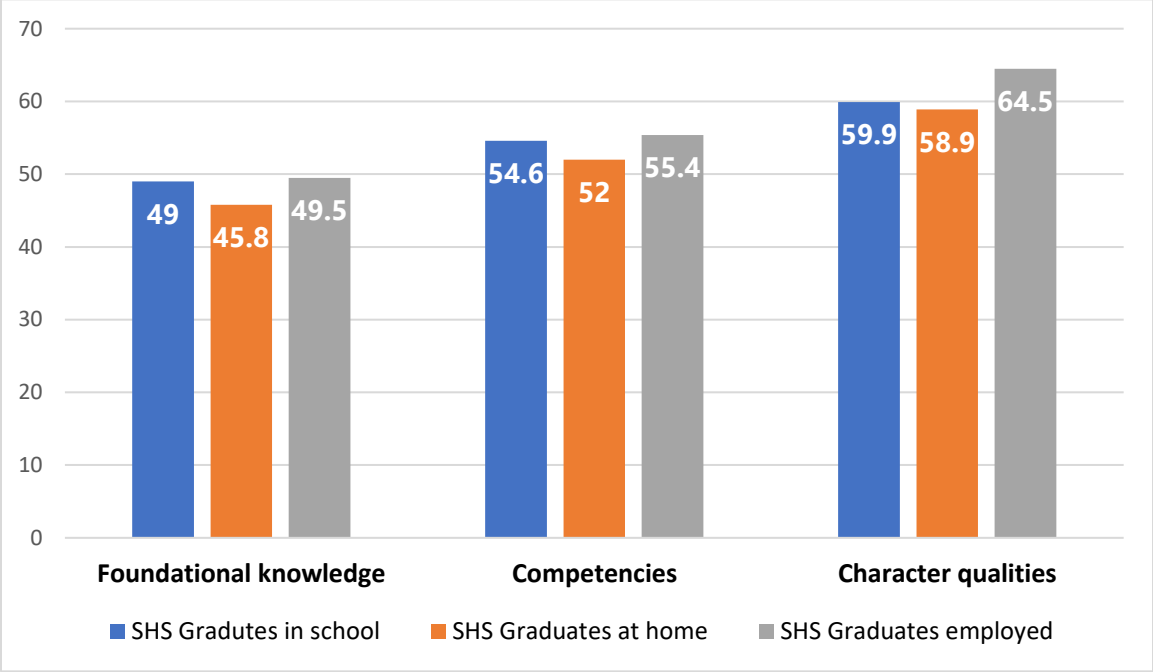


Table 3.18 also presents the results based on the components of the 21st century skills assessed. As shown in the results, most SEI graduates perceived they are well-equipped with items relating to cultural identity, responsible citizenship, and self-confidence, which are mainly character quality related. ICT and digital literacy had the least (54.8 percent) proportion of SEI graduates who perceived they are equipped with these skills.

Table 3.18 Proportion of SEI graduates who satisfy the indicator requirements of the 21st century skills (%)

Subjects	SEI graduates in school	SEI graduates at home	SEI graduates employed	Total
Cultural identity, civic literacy, and global citizenship	81.7	83.6	88.2	84.4
Responsible citizenship	81.5	81.9	82.5	82.0
Self-confidence	78.3	78.3	84.5	80.2
Collaboration	75.3	72.5	73.9	73.9
Communication	72.5	100.0	100.0	73.0
Discipline and integrity	71.6	69.5	75.7	72.1
Self-directed learning	67.8	69.6	73.5	70.2
Leadership	64.8	62.9	68.9	65.4
Adaptability and resourcefulness	62.3	61.9	63.3	62.5
Literacy	64.3	57.0	64.2	61.7
Critical thinking and problem solving	61.5	61.3	61.9	61.6
Financial Literacy	58.2	58.2	66.3	60.7
Numeration	61.5	58.9	61.5	60.6
Innovation and creativity	60.3	59.8	60.7	60.2
ICT and digital literacy	54.6	54.3	55.7	54.8

As part of the evaluation, the study conducted an exploratory factor analysis[17] using principal-component analysis to determine the variables relevant in measuring graduates' level of agreement with skills they were taught in SEIs. A total of 49 questions assessed on a five-point Likert scale (5= strongly agree, 4= agree, 3= neither, 2= disagree, 1= strongly disagree) was used in the model. The model retained six factors because they had eigenvalues greater than 1. The six factors together explain about 64 percent of the total variance; this implies that the factors suggested by the model are efficient in replacing the initial variables used to measure the indicator. Overall, 45 items were retained within the six factors using a factor loading criteria of 0.5 or greater. Please see the full list of items in table 3.46 in annex 3.3

Qualitative insights on SEI graduates' perceptions on being well-equipped with 21st century skills

The findings from the quantitative analysis were similar to those of the qualitative result. Generally, some SEI graduates perceived that they are not well-equipped with 21st century skills while others perceived that they are well-equipped. For example, some graduates perceived that they are equipped because they were taught well. Their secondary education has enabled them to communicate well and start their own businesses. On the other hand, some graduates believed that they are not well-equipped with 21st century skills because they had a limited

[17] Factor analysis is technique that is used to reduce many variables into fewer number of factors. It is also used to determine patterns in data to help reduce the number of variables measuring similar items. In the context of this report, 49 variables were used to measure the 21st century skills of SEI graduates. Factor analysis was used to reduce the number of items to 49 by determining the items with a similar response pattern.

learning period in school due to the impact of COVID-19. Others also revealed that they lack skills needed for work and were inadequately taught in their SEI. Below are some qualitative insights from the study:

Graduates who perceive that they are <u>not</u> well-equipped with 21st century skills	Graduates who perceive that they are equipped or somehow equipped with 21st century skills
• *"I'm currently studying environmental science at the tertiary level. I have some subject knowledge though not 100 percent, I have some knowledge because if I was not taught, I do not think I would have chosen the programme that I am studying at the moment. But honestly, I will say I'm not well-equipped with 21st century skills because I did science at my SEI but no practical sessions and there are so many things that I studied that I still have no knowledge about. I don't think I was adequately taught in secondary school, because during covid we were asked to go home, and we spent more than two months at home. We could not complete more than half of the syllabus. The teachers do not really pay attention to us, and they expect us to learn on our own to understand. I cannot rely on what I did at the SEI to do something." – **Male SEI graduate*** • *"I'm not really well-equipped with the 21st century skills because there were no technological tools to improve our skills. The school did have computers or projectors to enhance teaching and learning. Also, I was not well taught in SEI due of the double track system and COVID-19 break which limited our time spent in school and affected our studies. Teaching and learning was not practical at all, and the technological tools needed for aspects of practical work were insufficient." – **Male SEI graduate*** • *"I think SEI alone doesn't equip students with the skills needed for work unless you further your education to the tertiary level so, for now I will say am not equipped. Completing SEI cannot make me well-equipped with the skills needed for work." – **Female SEI graduate*** • *I am not 100 percent sure that I'm well-equipped with subject knowledge because some of the topics were not taught and I had to learn them on my own. But for 21st Century skills, I don't consider myself to possess such skills. The teaching at the secondary school was fair but not good enough. Some of the teachers were not competent enough in their subject areas that they taught, and one can clearly see that when they are teaching. Some of the teachers were also not punctual to class. Instead of them to come to class early and teach for about two hours, they'll report to school late and spend about thirty minutes in class. – **Male SEI graduate***	• *"I have subject knowledge in General Arts which I studied in secondary school. The teachers were well trained, and we had the resources needed to study. I believe I am equipped with 21st Century skills because we were taught well, and our teachers had the knowledge, so we got the chance to acquire a lot. But it was not much of a practical learning, so, I did not have the absolute understanding of a few of the topics treated back in school." – **Male SEI graduate*** • *"I am somehow equipped because subjects like math which we learned in SEI has helped me a lot so, it will be difficult for somebody to easily outsmart me in terms of counting during transacting business. Also, I have some friends who cannot read so I read messages and interpret for them when the need arises." – **Female SEI graduate*** • *I think I am equipped because we were mostly encouraged to learn hard in order to progress for further studies or find a job. An NGO called CAMFEB used to come to our school to give us knowledge on entrepreneurship and encouraged those with other skills to come for further training to enhance their skills. So, I think I learnt some skills at school. – **Female SEI graduate*** • *Yes, I think I have subject knowledge because what I studied has helped me to adapt to the society in areas like communicating with someone in English, writing application letters and setting up an animal farm. I think I'm equipped with some of the 21st century skills because I'm now responsible enough to take up roles, I now know how to relate to and communicate well with people, I'm now able to think critically to analyse situations. – **Male SEI graduate*** • *I think so, because previously I was not well educated. During my time in primary and JHS, I knew nothing. But when I entered SEI I have been able to communicate, write letters and applications so, secondary school has equipped me… I didn't know how to do that but now I can do it because of SEI. **– Male SEI graduate***

Most graduates believe that they need to further their education before acquiring the necessary skills to work. Below are some verbatims from qualitative interviews:

- *"More technology, more resources like laptops, mobile phones, microscope and other tools to be used in the laboratory. The course I read now there is a software called GIS that most students do not know about, and it will even be advisable if they start teaching it at the SEI because is very important. I have forgotten the full meaning, but it is geographical, and science related, and it is used for mapping and tracking. We should be introduced to software like SPSS because most of the students do not know what SPSS is about and when given project work, they have to pay money for other people to do the work for them." -* ***Male SEI graduate***
- *"To gain more knowledge and skills, I need to gain more experience and skill set to be employed or further my education by engaging myself in a practical skills training"* ***Male SEI graduate***
- *"I think knowledge on marketing and how to get capital to start a business. I am a hairdressing apprentice if I learn how to market myself it will be good". –* ***Female SEI graduate***
- *"Well, I still need some additional formal education and knowledge in ICT, which I'm still working on."-* ***Male SEI graduate***
- *"I must further my education that is to the tertiary and believe that I will get the skills needed for work" -* ***Male SEI graduate***

3.4 Employer outcome indicator results

Outcome indicator Employers' perceptions of secondary education graduates' work readiness

One of the T-SHEL's outcome indicators assesses employers' perceptions about SEI graduates' work readiness. The study computed a mean percentage score based on the responses (likert scales were used to assess the work readiness) of the employers. An employer who obtains a minimum of 4.00 out of 5.00 (80 percent) is recognized as meeting the criteria for the indicator. In other words, an employer who obtains a minimum of 80 percent score is classified as "perceiving that SEI graduates are work-ready".

Figure 3.6 presents the proportion of employers who perceived that SEI graduates are work ready. Three out of ten (31.9 percent) employers perceived that SEI graduates are work ready. A similar proportion was observed for both male and female employers.

Figure 3.6 Proportion of employers who perceive that SEI graduates are work-ready (percent)

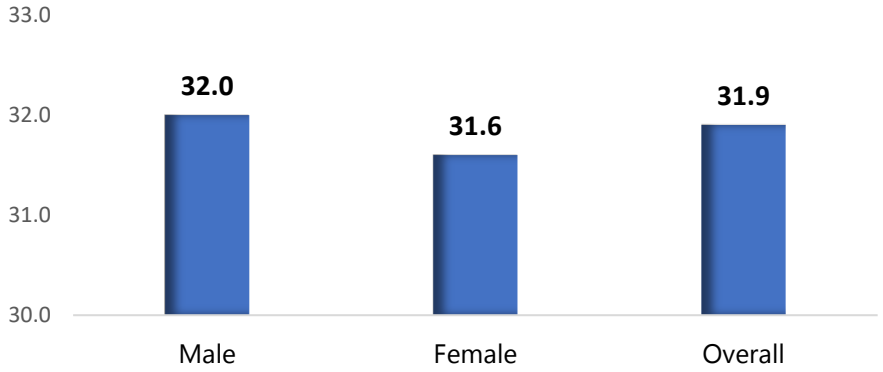
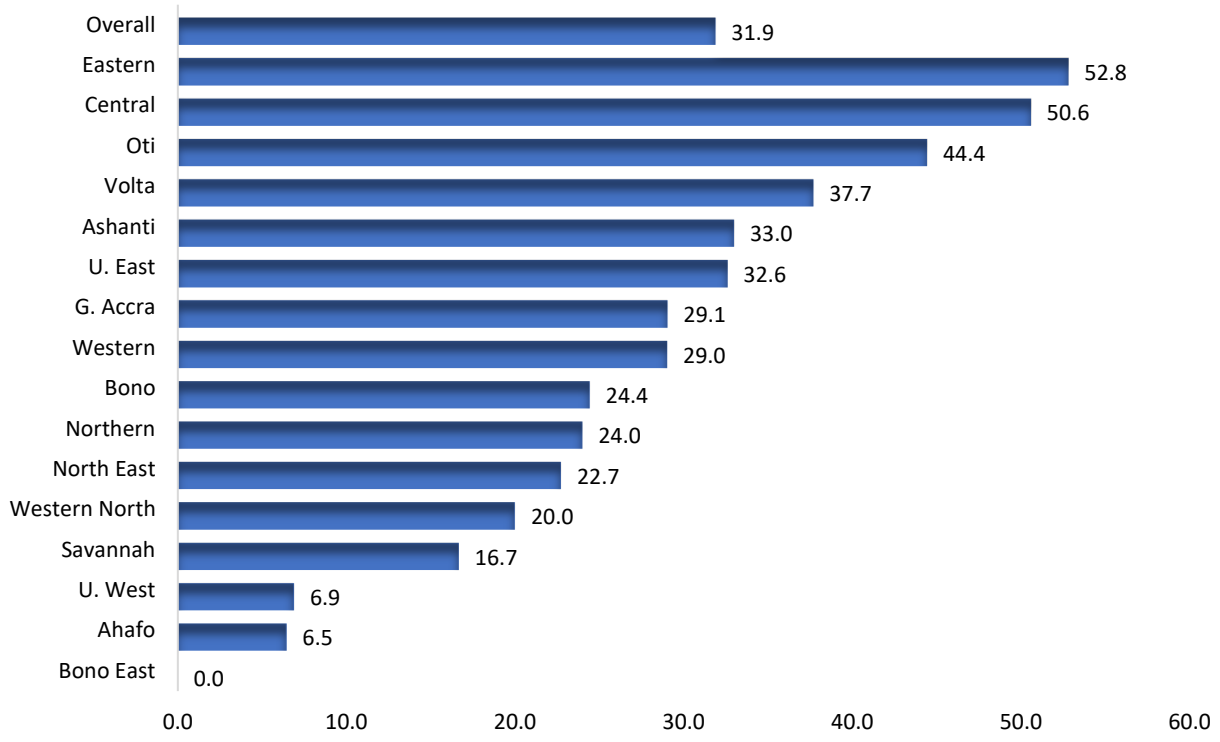


Figure 3.7 also presents the proportion of employers who perceived SEI graduates are work-ready by region. Again, the results show that about half of the employers from the central and Eastern regions perceived SEI graduates in their region are work-ready compared to the other regions.

Figure 3.7 Proportion of employers who perceive that SEI graduates are work-ready, by region (percent)



The survey also asked employers to identify SEI graduates' strengths and weaknesses in the three domains of 21st century skills: knowledge (such as literacy), competencies (such as critical thinking skills), and character qualities (such as discipline and integrity). Based on the results from table 3.19, over 60 percent of employers rated their SEI graduate employees high on character qualities. However, employers also rated SEI graduate employees low on foundational related skills (such as numeration).

Table 3.19 Proportion of employers who perceive SEI graduates are work-ready, by components of 21st century (%)

Subjects	Male	Female	Total
Cultural identity, civic literacy, and global citizenship	71.0	75.2	72.3
Collaboration	68.7	69.9	69.0
Self-confidence	60.8	70.8	63.9
Discipline and integrity	60.5	67.8	62.8
Responsible citizenship	60.8	65.7	62.3
Communication	61.2	64.5	62.2
Adaptability and resourcefulness	58.0	63.0	59.6
Self-directed learning	51.6	60.3	54.4
Literacy	51.1	55.8	52.6
Financial literacy	46.9	51.9	48.5
ICT and digital literacy	46.5	47.8	46.9
leadership	44.0	47.8	45.2
Critical thinking and problem solving	43.7	44.2	43.9
Innovation and creativity	43.5	44.5	43.8
Numeration	41.1	43.0	41.7
Total (N)	**734**	**335**	**1068**

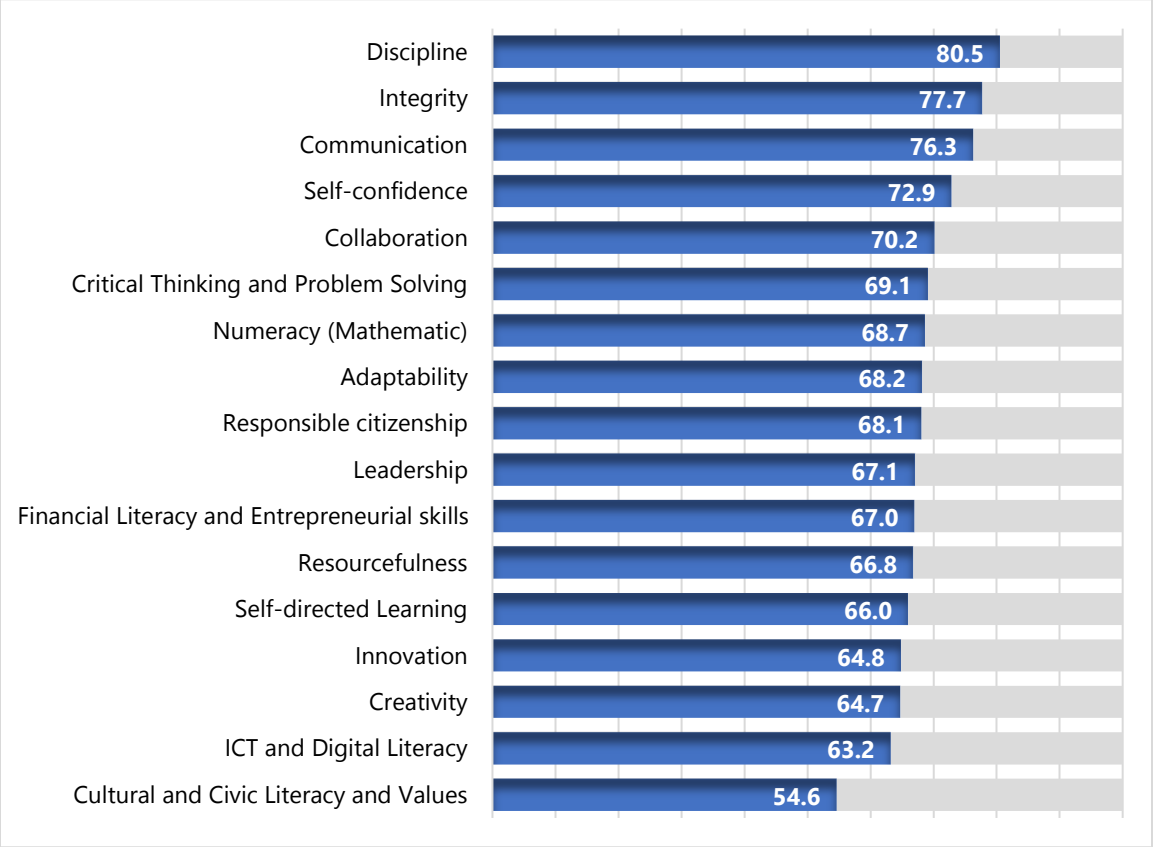
Table 3.20 presents employers' perception of SEI graduates' work readiness based on the sector of the economy they are employed.

Table 3.20 Employers' perception of SEI graduate work readiness by economic sector (%)

	Foundational Knowledge	Competencies	Character Qualities	Overall
Public administration	57.1	57.1	57.1	57.1
Livestock and poultry	28.6	71.4	57.1	57.1
Electricity and gas	50.0	37.5	50.0	50.0
Information and communication	50.0	50.0	56.3	50.0
Financial and insurance	47.6	42.9	61.9	47.6
Education	37.1	35.5	46.8	33.9
Administrative support service activities	25.0	41.7	41.7	33.3
Arts, entertainment, and recreation	19.1	33.3	66.7	33.3
Wholesale and retail trade	35.0	35.8	40.3	32.5
Construction	36.8	31.6	31.6	31.6
Accommodation and food	32.0	30.9	39.2	30.9
Professional, scientific, and technical	30.0	35.0	30.0	30.0
Human health and social work	30.0	45.0	45.0	30.0
Manufacturing	30.1	30.7	38.6	24.8
Water supply, sewage, and waste management	33.3	50.0	16.7	16.7
Transportation and storage	12.5	25.0	12.5	12.5
Real estate	0.0	20.0	40.0	8.5
Mining and quarrying	0.0	0.0	0.0	0.0
Crops	0.0	0.0	0.0	0.0
Total (N)	**1,068**	**1,068**	**1,068**	**1,068**

Employers were asked to indicate the 21st century attributes they believe are essential for graduates to succeed in the world of work. The two most important attributes employers perceive to be important are discipline and integrity (figure 3.8).

Figure 3.8 Attributes employers perceive are essential for graduate students to succeed in the world of work (percent)



Employers were asked to list the competencies, skills, and abilities expected of SEI graduates. Most employers identified numeracy as being the most sought after and important in the selection process of SEI graduates. This is followed by the ability to work in a team and use business language. Less than half of the employers expect SEI graduates to have initiative qualities, computer skills, and problem-solving skills. The survey also found that employers across the three belts have similar expectations of SEI graduates. (See table 3.21)

Table 3.21 Employers expectations from newly recruited SEI graduates (%)

	Northern Belt	Middle Belt	Southern Belt	Total
Be able to use numbers effectively relating numbers to the job	83.6	71.8	78.3	76.6
Be able to work together and communicate	68.5	55.3	69.2	64.0
Be able to use business language effectively	70.6	58.6	59.6	60.7
Be ready to make suggestions or introduce new ideas	61.6	44.7	50.1	49.7
Be able to use information technology effectively	57.5	47.2	49.3	49.7
Be able to think and solve problems	55.5	38.1	48.2	45.5
N	146	394	529	1068

3.5 TEI lecturers' and tutors' outcome indicator results

Outcome Indicator: TEIs' perception of secondary education graduates' demonstration of 21st century skills

This indicator provides information on the readiness of newly entering tertiary students (SEI graduates) to demonstrate 21st century skills as defined in the secondary education strategy. The indicator provides an indirect measure of entering students' preparedness for tertiary education. Tertiary education lecturers who teach first-year students were asked to assess the students' 21st century skills. The evaluation question was based on the likert scale (5= strongly agree, 4= agree, 3, neutral, 2= disagree, 1=strongly disagree). The study computed the mean percentage composite score by dividing the average achieved by five and then multiplying by 100 percent. Tutors and lecturers who obtained a minimum score of 80 percent were deemed to have satisfied the indicator criteria. For instance, if the average score obtained is 3.8; the score would be computed as ($\frac{3.8}{5}$ *100) = 76.0 percent (see annex 1 for the scoring rubrics developed). The skills areas evaluated include foundational knowledge, competencies, and character qualities.

Figure 3.9 provides the results of TEI stakeholders. Based on the results, about 1 out of 10 (11.3 percent) lecturers and tutors perceived SEI graduates to demonstrate 21st century skills. The result is similar across all TEIs with no significant differences.

Figure 3.9 TEI lecturers and tutors' perception of SEI graduates' demonstration of 21st Century Skills (%)

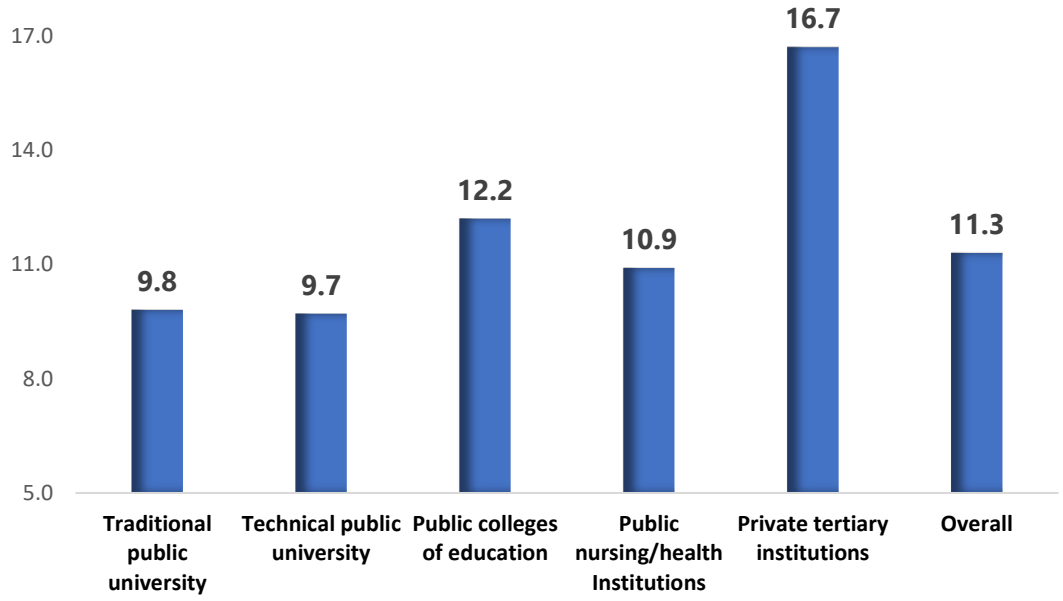


Table 3.22 presents the responses of TEI lecturers and tutors on the attributes of the 21st century skills. Based on the results, less than a fifth of TEI lecturers and tutors perceived SEI graduates to demonstrate innovation and creativity (18.9 percent) and financial literacy (18.3 percent).

Table 3.22 Tertiary tutors' percentage scoring of SEI graduates, by components of 21st century (%)

	Traditional public university	Technical public university	Public colleges of education	Public nursing /health institutions	Private tertiary institutions	Total
Discipline and integrity	65.1	64.5	60.6	67.3	72.2	63.2
Collaboration	41.4	25.8	42.5	41.8	50.0	41.5
Cultural identity, civic literacy, and global citizenship	35.8	32.3	42.8	47.3	66.7	41.0
ICT and digital literacy	40.9	29.0	37.5	47.3	50.0	39.4
Communication	35.4	32.3	37.8	38.2	55.6	37.3
Adaptability and resourcefulness	34.4	22.6	27.8	30.9	61.1	31.0
Self-confidence	29.8	16.1	33.8	21.8	44.4	30.8
Literacy	30.7	19.4	30.0	25.5	61.1	30.2
Responsible citizenship	22.3	19.4	32.8	45.5	38.9	29.9
Leadership	28.8	22.6	28.8	25.5	55.6	29.0
Critical thinking and problem solving	24.2	16.1	30.0	34.6	27.8	27.7
Numeration	18.1	22.6	24.4	25.5	33.3	22.5
Self-directed learning	20.9	22.6	22.5	18.2	44.4	22.2
Innovation and creativity	15.8	16.1	20.0	21.8	33.3	18.9
Financial literacy	17.2	12.9	18.4	21.8	27.8	18.3
Total (N)	**270**	**46**	**375**	**57**	**20**	**768**

Qualitative insights on TEI lecturers and tutors' perception about SEI graduates

Qualitative insights revealed that most tertiary lecturers and tutors interviewed perceived that SEI graduates lack the ability to demonstrate 21st century skills. Some of the reasons lecturers and tutors gave include SEI graduates having a weak foundation because they only learned to pass exams during their time at the SEI, lack of communication skills, inability to apply knowledge, memorizing concepts without understanding, and poor comprehension of the English language. Below are some verbatims from interviews:

- *"Most SHS graduates lack the skill of being proactive or taking initiation for most things. For instance, my first-year students must be told everything. Even when you give them simple assignments, they will not write important things like their name or index number. They sometimes fail to do their monitoring duties on time, etc. They would write textbook definitions and cannot explain the issues."* – ***Tertiary tutor, public colleges of education***
- *"I think most of the SHS graduates fresh from school who get into the college of education do not demonstrate any 21st Century skills because they lack the ability to apply and transfer knowledge to*

perform a skill. It is rather those who, after graduation from SHS have stayed in the house or worked somewhere as apprentices who exhibit skills. Most of them lack basic knowledge on the things they have a certificate on, and this differs from individual to individual and the schools they graduated from." – ***Tertiary tutor, public colleges of education***

- *"Okay, I think the SHS graduates we receive these days are not good as we expected of them. In the first place, they copied and passed their exams and got here. They are still looking for short-cuts to pass their exams here, can you imagine that? No seriousness in their studies. Poor expressions in the English language. However, they are comparatively quite better in their ICT skills than those days. We need a paradigm shift in our educational curriculum. They need to believe in themselves that they can make it, and that would help them to be serious. Lastly, I think we need to train them more if only they will cooperate with us." –* ***Tertiary tutor, traditional public university***
- *"No, they are not able to demonstrate the 21st century skills. Well, maybe the knowledge is fine, but the skills are quite problematic... SHS graduates are not able to demonstrate the skills. They are not able to apply the knowledge they acquired in a related field. Character traits such as resilience when they are learning are a trait, but they cannot demonstrate that probably because what is being practiced at the SHS is "chew and pour... pass and forget". In the long run, they are not really able to demonstrate the confidence that they need." –* ***Tertiary lecturer, traditional public university***
- *"They demonstrate weak 21st century skills and knowledge. As they come to our institution, they find it difficult to understand simple concepts and I think it's because they have a weak foundation. Their ICT skills is very poor, and I think it is because they didn't see or use computers in their secondary school days. Some can't even boot a computer. Teaching and learning is also abstract at the secondary school. It should be practical. Their communication skills are poor. They are not fluent and can't comprehend simple text or passage." –* ***Tertiary tutor, public nursing/ health institution***
- *"... Most of the SHS graduates don't demonstrate adequate knowledge of 21st-century skills. It's only a few of them that demonstrate ICT and literacy skills." –* ***Tertiary tutor, public colleges of education***
- *"Many first-year students are able to use the internet to search for information for their assignments. So, they demonstrate efficiency in ICT literacy. But for critical thinking and problem-solving skills, majority of them lack it because they simply cannot read and analyse literature. Because of this, students copy from each other, and they do not demonstrate problem-solving skills. This is because SHS graduates do not critique their sources of information. The students only do copy and paste, and they do not do logical and deductive reasoning in contributing to knowledge." –* ***Tertiary lecturer, traditional public university***

As part of the qualitative study, tutors and lecturers were asked to share their opinions on SEI graduates' challenges in demonstrating subject knowledge and 21st Century Skills. Below are some of key challenges identified by TEIs:

- *"The challenge for the SHS graduates is that most of them did not allow themselves to be thought but went through the school as students whose focus was only to pass exams without thinking about the acquisition of knowledge and skills. Also, they are learning a lot of things within a short time due to the*

structure of the curriculum making it difficult to for them to acquire and demonstrate 21st Century skills." – ***Tertiary tutor, public colleges of education***

- *Well, there is poor content acquisition at the SHS level. Some had too many theories without practical knowledge. Who am I to blame them, political interference affected them? When their formators were not given the free will to train them as expected. Some of their trainers did not specialise in what they were teaching them. You can imagine an economics teacher teaching students Mathematics for the students to get to the university to read a Math related program! Well, some didn't even have the resources to help them. How well will you train students when there are no well-equipped laboratories and other teaching and learning resources? We have a problem in this country!* – ***Tertiary tutor, public colleges of education***

- *"Since they are not able to recollect what they learnt at the senior high level, [chew pass and forget], when they come to the tertiary level and you examine them, you'll realise that they learnt nothing over there... A waste of time. You have to go over what they learnt at the SHS level before they able to equip themselves and gain confidence for the next task."* – ***Tertiary tutor, Public Colleges of Education***

- *"... SHS graduates are always suffering when they are required to demonstrate knowledge in technology like searching for information for assessments and others. They don't want to even try; they want the tutor to come and feed them. They said they don't have time, so it's difficult for them to even read not to talk of searching for information. Apart from one person who is doing his best, the rest, majority of them just sit there."* – ***Tertiary lecturer, traditional public university***

- *"I think one of the main challenges of these SHS graduates is lack ICT and communication skills."* – ***Tertiary tutor, public nursing/ health institution***

- *"Some of them are lazy and not ready to learn. Another challenge that affects them is lack of teaching and learning resources."* – ***Tertiary tutor, public nursing/ health institution***

- *"These SHS graduates lack good communication skills in English Language, which is the medium of communication in Ghana. SHS graduates also lack effective learning skills. They just read for the sake of it without understanding."* – ***Tertiary tutor, public nursing/ health institution***

The survey sought the perspective of TEI lecturers and tutors on what SEI graduates need to be able to demonstrate subject knowledge and 21st century skills. Input from key informant interviews revealed that SEI graduates who aim to continue their education at the tertiary level need to be trained using learner-centred teaching methods, be provided with practical subject knowledge, discipline, and adequate learning resources such as well-equipped libraries and ICT centres. Here are some qualitative insights from the interviews:

- *Teaching of concepts must use the activity methods for them to do learning not just listen.* – ***Tertiary tutor, public colleges of education***

- *"They need to believe in themselves, be humble and ready to learn, and learn. They should also link what they've learned at school to everyday life activities. They should be bold to exhibit whatever skills they have acquired in solving problems instead of creating problems, for example, knowledge and skills in technology." –* ***Tertiary tutor, public colleges of education***

- *"They need a good curriculum to help train them well. Secondly, the availability of teaching and learning resources, well-equipped labs, and libraries could help a lot. Knowledge sharing among teachers/lecturers should be the way forward. A year ago, a student came to my office requesting to change his programme. I asked him why he wanted to do that, and he told me he was pushed to read the current programme by some of his friends. What a waste of time and resources? Was he guided by a professional to choose his programmes? We need professional counselors in this country to help the young ones to succeed in this 21st century." –* ***Tertiary tutor, traditional public university***

- *"What they [SEI graduates] need? They need to be determined because this academic work it's all about discipline, if you are not disciplined, you can't really cover a whole lot of scope, but if they are really disciplined and determined, I'm sure they can stand up to the challenge. In terms of training, the syllabi dictate what we do, and that is exactly what we do." –* ***Tertiary lecturer, traditional public university***

- *"They need practical knowledge of the things that they learn, and exams should be practical too. Since the examination is usually theoretical, students memorize concepts without having any understanding; the focus is just to pass the exam. Teaching should also be done in concentric approach." –* ***Tertiary tutor, public nursing/ health institution***

- *"Teaching and learning should be done in a collaborative manner using ICT. The lecture method should be avoided. Teachers should use student-centered methodologies." –* ***Tertiary tutor, public colleges of education.***

- *To have good content knowledge, SHS graduates should be able to do effective learning to internalize knowledge. We, the lecturers, must adopt and use both lectures and student-centered pedagogical approaches during lectures. Lecturers should also adopt higher-order questioning with students to aid bring out the best in them. For instance, questions like "what is" must give way to analytical questions like "How did you arrive at this answer", "why do you agree or disagree with this preposition", etc. –* ***Tertiary tutor, traditional public university***

3.6 Teacher-related results

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

Output Indicator Percentage of teachers who are motivated and want to remain in the profession

This indicator measures the motivation of SEI teachers and their desire or expectation to remain in the teaching profession till they reach the retiring age. The survey asked SEI teachers to self-rate whether they agree or disagree (5-point likert scale) with questions relating to teacher motivation[18]. In measuring this indicator, the score was computed by dividing the average score obtained by five (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 ($\frac{3.8}{5}$ *100) = 76.0 percent. In measuring teachers' intent to remain in the profession, the study asked questions relating to teachers' intention to remain or leave the profession. The result is presented in table 3.23.

The results show that less than a tenth of the teachers are motivated. Some of the challenges cited by the teachers are teacher remuneration (43.5 percent) and lack of better conditions of service (48.6 percent). The results further show that less than half of the teachers (42.1 percent) want to remain in the teaching profession despite the low level of motivation, with significantly more female teachers than male teachers. However, the study does not note any significant differences across demographic characteristics of schools.

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
Sex of teacher		
Male	8.7	39.5
Female	11.9	49.1*
School classification		
Class A	11.8	44.7
Class B	9.9	41.3
Class C	8.9	42.0
Years of teaching		
Less than 5 years	11.3	43.5
5 to 10 years	8.9	40.8
More than 10 years	8.7	41.8
School sex		
Mixed sex	12.5	41.9
Single sex	9.3	44.2
Overall	**9.6**	**42.1**
Total (N)	**1,453**	**1453**

*P ≤ 0.05

Table 3.24 presents the results of the questions on teacher motivation. The results observed are the proportion of teachers who strongly agree/agree to the questions on motivation. The results reveal that about 9 out of 10

[18] Based on work done by the world bank.

teachers agree that their remuneration is insufficient. About 70 percent also indicated that they would leave if a job offered with the same or slightly higher salary was available to them.

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

Items assessed for teacher motivation	Male teachers	Female teachers	Overall
As a teacher, I am contributing positively to the lives of my students.	97.2	97.7	97.3
I feel confident about my abilities as a teacher.	95.0	95.6	95.2
I can get students to work in groups or pairs.	94.0	97.2	94.8
If a student does not remember information in a previous lesson, I would know how to help them remember.	94.4	95.6	94.7
Every teacher can continue to improve their practice throughout their career.	91.4	93.5	92.0
I can make my classroom a safe space for students, both emotionally and physically	90.8	92.3	91.2
I can motivate students who show low interest in school.	90.9	90.4	90.8
If a student in my class is undisciplined, I know some techniques to direct him or her.	90.5	90.7	90.6
With the help of my colleagues, we can solve student issues.	90.1	90.4	90.2
My pay as a teacher is insufficient to support my needs	90.6	88.1	90.0^
With the help of my colleagues, we can identify innovative practices.	90.3	86.8	89.4
When a student gets a better grade than he or she usually gets, it is because I found a better way.	82.7	86.3	83.6
I can get through to even the most difficult or unmotivated students.	82.3	85.5	83.1
My headteacher treat me with respect.	80.7	83.2	81.4
I feel exhausted at the end of the school day	81.3	79.6	80.9^
I feel energized when my class greets me each day	76.0	81.1	77.4
My colleagues at school make it a fun place to be.	74.6	80.6	76.2
I can help students overcome some difficult home and community	74.8	75.7	75.0
I ask my colleagues for feedback.	73.6	71.6	73.0
I ask my supervisor for feedback.	71.2	74.9	72.2
I would accept that offer if I were offered another job outside the teaching profession at about the same or a slightly higher salary.	71.1	66.4	69.9^
I have the ability to get parents involved in their children's education.	68.8	65.1	67.8
My headteacher praises me for my efforts in the school.	62.2	62.3	62.2
Some teachers at my school want to transfer to schools	57.6	56.1	57.2^
Parents value my work as a teacher.	53.6	54.5	53.8
Teaching is mentally draining.	52.1	56.1	53.1^
I feel fatigued when I get up in the morning and have to face another day at school	53.3	51.4	52.8^

Items assessed for teacher motivation	Male teachers	Female teachers	Overall
I plan lessons with a colleague	52.2	54.3	52.7
I can influence some of the decisions that are made in the school.	50.6	45.0	49.1
As a teacher, I am given more responsibilities than I can manage.	38.8	38.2	38.7^
If I had to choose again, I would still want to be a teacher.	34.0	44.7	36.8
Teachers in my schoolwork closely with the district SISOs (formerly circuit supervisors)	34.9	32.0	34.1
I do not get paid on time.	19.1	17.8	18.8

NOTE: ^ Respondents who agree/strongly agree to a negative statement. In the computation of the rubric, the highest score was allotted to those who disagree strongly and the least score to teachers who agree strongly.

The study computed a multiple linear regression model to determine the demographic variables significant in predicting the composite score. The model results show that teachers with 5 to 10 years of experience had a mean score of 1.3 percent lower than teachers who have taught for less than 5 years. Please see table 3.47 in annex 3.6 for the entire table.

As part of the analysis, the study conducted an exploratory factor analysis using principal component analysis to determine the variables relevant in measuring teacher motivation based on the Likert scale used for the assessment. A total of 34 questions assessed on the five-point likert scale (5= strongly agree, 4= agree, 3= neither, 2= disagree, 1= strongly disagree) was used in the model. The model retained three factors based on the analysis because they had eigenvalues greater than 1. The three factors together explained about 82 percent of the total variance. Also, 12 items were retained within the three factors using a factor loading criteria of 0.5 or greater. Please see the complete list of items in table 3.49 in annex 3.6

Qualitative insights on teachers who are motivated and want to remain in the profession

Key informant interviews were carried out with teachers to explore the reasons for their motivation or lack of in their teaching profession. As established in the quantitative findings, less than a tenth of the teachers are motivated, while about 40 percent still want to remain in the teaching profession. Some teachers explained that despite the lack of motivation due to low wages and conditions of service, they enjoy teaching and are happy when their students become prominent people in society.

A section of the teachers cited "disrespect" for the teaching profession as a reason for the low motivation. With regards to teachers remaining in the profession, a section of the teachers said that they do not have alternative jobs for teaching and that is their reason for being in the profession. Quotes from teachers have been cited below:

- *"I will describe my motivation in this job to be very poor in the sense that teachers are not regarded by any government in this country. I don't desire to remain in teaching because the profession is not regarded in this country." –* ***Male, class B, mixed-sex school***

- *Motivation is very poor. Teachers have not been motivated either by appreciation or in any other form. But for now, I will remain in the profession because there is no other alternative except work with the GES. –* ***Male, class C, mixed-sex***

- *Motivation is non-existent. There is no motivation. Most of the times when our supervisors and people in high positions come around, they just want to find fault and criticize you. Motivation is poor. Since motivation is low and we all know remuneration and salaries are not quite up to standard, if there is an option to leave into a better paying and better motivation job, I will leave. I do not think I will remain in this job. –* ***Female, class C, mixed-sex***

- *"…I will say that we are not much motivated to do the work. If you consider the two types of motivation, I will say we are not motivated in both ways. When it comes to intrinsic motivation, in fact, we are loaded with a lot of work in our school because of the periods that we have been teaching. So, it makes you become demotivated when you look at the workload that you are supposed to do. So, in terms of the intrinsic the heavy workload demotivates most of the teachers. In terms of extrinsic, we're not really motivated. This is because previously, when we had the PTA system, we were organising extra classes and they were also receiving some money at the end of the term. But when the free SHS system came in, they have not been paying so in monetary terms, motivation it is also very low." –* ***Male, class B, single-sex***

- *[laughs]… I'm I willing to remain in this profession? Well, if the current conditions of work remain unchanged, then I will have to find a better job. As we speak, If I get a better job, I will just quit and go. So, yes it depends on the conditions of service. –* ***Female, Class B school, single-sex***

- *Hmm, my motivation is quite low. It is quite low in terms of finances and how the teachers are portrayed. You know, Ghanaians talk about how poor teachers are so, there is no regard for teachers for teachers in this country. If I get a better job opportunity, I will quit my profession immediately. –* ***Male, Class B school, single-sex***

- *The motivation in the teaching profession is not adequate because the government has neglected the teaching profession; no allowance and teachers must be in classroom for the whole year without any additional incentives. Honestly, I'm not willing to remain in this teaching field. "-* ***Male, class c, mixed-sex***

Below are quotes from teachers who indicated they are motivated and yet would not want to remain in the teaching profession:

- *"I am motivated by the fact that I am privileged to be helping in the nurturing of the future leaders of our country and I love the profession, but I don't to remain in the teaching profession because it doesn't pay. Everyone needs something to take care of their personal and family needs." –* ***Female, class B school, single-sex***

- *"It is basically an intrinsic motivation that keeps me going in my teaching profession. For extrinsic motivation, if not completely absent, then very low. I am still in the teaching profession due to the blessings I receive from parents/guardians and students when my students become successful. But I*

may quit the profession when I chance upon any job that is lucrative in terms of remuneration and with good terms of condition." – ***Male, class A school, single-sex***

- *"It's somehow encouraging but our expectations are not fully met in terms condition of service. I can say that many of us are not willing to remain in teaching because the workers in the profession are not paid well." –* ***Male, class C school, mixed-sex***

Below are also quotes from teachers who are not motivated but would remain in the teaching profession:

- *"As teachers, our motivation is very poor. Some of our challenges are due to our inability to manage our finances and other resources well. However, we are sure of regular salary which is not bad. I am also motivated when the students I teach progress positively. I meet my past students making it in life which makes me proud as a teacher... I love the teaching profession; however, the leading stakeholders must work hard to make it lucrative so that many teachers will not think of leaving in future." –* ***Male, class A school, single-sex***

- *"My motivation and that of many teachers is very poor because our working conditions are not the best. We are still in the job because we have no choice. If you leave, what are going to do really? Getting a better job is not an easy task especially if you have no helper." –* ***Male, class A school, mixed-sex***
- *"I'm not motivated because as teachers, we are not held in high esteem even by the leaders of this country. Our salary, although regular, it's high insufficient. But I love the teaching profession and when the students I teach develop into prominent people, it makes me happy." –* ***Female, class B school, single-sex***
- *"In terms of extrinsic motivation, I will say that it is on a low level because of financial reasons; the salary is just not adequate... but well... God has been good. As the school guidance and counselling coordinator, when I contribute to lessen the burden of students and to help them see the brighter side of life, I am always happy as a priest and a teacher too. I'm willing to remain in the profession because I am left with just some few years to retire from active service so why should I worry myself to look elsewhere." –* ***Male, class B school, mixed-sex***

- *Motivation is very poor. Teachers have not been motivated neither by appreciation nor in any other form. But for now, I will remain in the profession because there is no other alternative except work with the GES. –* ***Female, class C school, mixed-sex***
- *"In financial terms, I am not motivated but I love to teach. I'm only motivated to teach because of the love I have for the work. I love to impact the knowledge that I have gained to others so that they will also gain some knowledge." –* ***Male, class B school, mixed-sex***

3.6.2 Teachers in SEIs displaying competencies in NTS

Output Indicator: Percentage of teachers in SEIs displaying core competencies in the NTS

The NTS represents the first ever collectively agreed standards to guide teacher preparation and practice in the country. The NTS have been 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, qualities they are expected to possess and some behaviour 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 pre-tertiary level.

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

As depicted in box 3.1, the NTS is divided into three domains, each with its subdivisions. In measuring this indicator, the mean composite scores for lesson observation, teacher interview, and SEI students' scores were triangulated. In computing the mean percentage composite score, the overall mean attained by a teacher is divided by four and a percentage calculated. For example, for the lesson observation, if a teacher obtains an average score of 3.2 out of 4[19] (The maximum score attainable), this will be equivalent (3.2/4*100) = 80.0 percent. For the teacher interview, if a teacher attained a total score of 45 out of 63, this will be equivalent to (45/63*100) = 71.0 percent. For student triangulation, if students had an average score of 2.8 out of 5, this will be equivalent to (2.8/5*100) = 56.0 percent. Therefore, the composite score for the indicator would be (80+71+56)/3 = 69.0 percent. A teacher will be deemed as satisfying the criteria of the indicator if they obtain a minimum score of 75 percent.

Table 3.25 presents the percentage of teachers demonstrating understanding and application of NTS. Less than a tenth of the teachers satisfied the criteria of the indicator.

[19] Lessons were assessed on a scale of 0 to 4, where 0= Not observed, 1= Poor demonstration, 2= Fair demonstration, 3=Good demonstration, 4= Excellent demonstration

Table 3.25 Percentage of teachers in SEIs demonstrating understanding and application of the NTS (%)

Category	Year 1	Year 2	Overall
Sex			
Male	2.9	2.7	2.8
Female	2.0	7.7	4.9
School classification			
Class A	0.0	0.0	0.0
Class B	1.6	4.5	3.1
Class C	4.1	5.0	4.5
School sex			
Mixed sex	2.9	4.2	3.6
Single sex	0.0	0.0	0.0
Overall	**2.7**	**3.9**	**3.3**
Total (N)	**188**	**203**	**391**

*p≤0.05

Table 3.26 presents the competency scores obtained by teachers; low scores were recorded among 8 of the 11 competency items.

Table 3.26 Teacher NTS lesson observation competencies (%)

	Male teacher	Female teacher	Overall
Teacher exhibits ethical teacher Codes of conduct during the lesson delivery	73.3	72.8	73.2
Creates a safe, encouraging learning Environment	56.6	62.1	58.1
The teacher listens to students and gives constructive feedback	55.9	63.1	57.8
Understands how children develop and learn in diverse contexts and apply this in their teaching	43.4	41.8	43.0
The teacher demonstrates effective, growing leadership qualities in the classroom	25.7	30.1	26.9
Teacher use of age and grade(s) appropriate strategies to enact in the lesson	22.6	24.3	23.0
Explains concepts clearly using examples familiar to students	10.4	6.8	9.5
Pays attention to all students, especially girls and students with special educational needs, ensuring their progress	6.6	7.8	6.9
Uses a variety of assessment modes during teaching to support learning	5.6	5.8	5.6
Employs a variety of instructional strategies that encourage student participation and critical thinking	3.8	0.0	2.8
Produces and uses a variety of teaching and learning resources that enhance learning, including ICT	0.7	0.0	0.5
Total (N)	**288**	**103**	**391**

Table 3.27 also provides information on the proportion of teachers who are aware of the NTS. The table shows that of the 1,453 teachers surveyed, more than half (55.4 percent) indicated that they are aware of the NTS, with slightly more males (56.6 percent) than females (52.2 percent). Across school classification, a higher proportion of teachers who claimed awareness of the NTS work in Class C (56.7 percent) schools, followed closely by teachers in Class B (54.2 percent) and Class A (52.8 percent) schools. The results further indicate that a higher proportion of teachers that are aware of the NTS have taught for more than 10 years (58.6 percent), followed closely by 5 to 10 years (57.9 percent) and then less than 5 years (48.8 percent).

Table 3.27 Proportion of teachers that are aware of the NTS (%)

Category	Percent
Overall	**55.4**
Sex	
Male	56.6
Female	52.2
School Classification	
Class A	52.8
Class B	54.2
Class C	56.7
Years of teaching	
Less than 5 years	48.8
5 to 10 years	57.9
More than 10 years	58.6
Total (N)	**1,453**

The survey asked teachers who indicated awareness of the NTS whether they have copies (hard and electronic copies) of the NTS. Results presented in table 3.28 show that 27.1 percent of the teachers that are aware of the NTS have copies with marginal variation between male (27.2 percent) and female teachers (26.7 percent).

Table 3.28 Proportion of teachers that have copies of the NTS (%)

Category	Percent
Overall	**27.1**
Sex	
Male	27.2
Female	26.7
School Classification	
Class A	27.1
Class B	29.2
Class C	25.9
Years of teaching	
Less than 5 years	27.0
5 to 10 years	33.9
More than 10 years	23.0
Total (N)	**1,453**

Qualitative insights on teachers understanding and application of NTS

The findings from the quantitative analysis were similar to those of the qualitative result where some teachers did not know the meaning of the abbreviation "NTS" until it was explained to them. According to some teachers, the focus group and KII sessions were the first time they heard of the NTS. Some teachers suggested that despite their lack of awareness of the NTS, they believe they apply the NTS in developing their materials for lesson delivery. See below quotes from teachers:

- *"No please, this is the first time I'm hearing National Teachers Standards and I have no idea how to apply it."* - ***Female, class C school, mixed-sex***
- *No, I don't even have any idea about the National Teacher's Standards, so, I don't have a good understanding about it.* - ***Female, class C school, mixed-sex***

- *"No, I don't understand the standards. I have not been given any National Teacher's Standards as a teaching guide. I will be very happy if teachers are taken through this NTS as a teaching guide so that it can also improve us professionally." –* ***Male, class B school, single-sex***

- *"We have not been educated on the National Teaching Standards, so I do not apply it, but I prepare my lessons and deliver it successfully." -* ***Male, class B school, single-sex***

- *I don't really have a full understanding because the framework for initial and continuous professional development throughout a teacher's career has not been effective in the sector. We only go through orientation and at times some in-service training that's all. So, there should be an effective continuous professional development for teachers at least twice a semester to prepare teachers to the task. Somehow, I always prepare my lessons notes for lesson delivery –* ***Male, class B school, mixed-sex***

- *"... I don't have a good understanding of the National Teacher's Standards because I have not been introduced to it yet." –* ***Female, class C school, single-sex***

- *"No, I have a little understanding of the NTS. I seldomly apply the NTS in my work because I don't have adequate understanding of it." –* ***Female, class A school, single-sex***

- *In fact, I don't even know what you are talking about, so I don't have a good understanding. –* ***Male, class B school, single-sex***

A few of the teachers who stated that they have a fair understanding of the standards perceived the NTS to be about the right behaviour with which a teacher must teach. However, none of these teachers were able to state the components or domains of the NTS or how they apply the competencies in during lessons. Below are some quotes:

- *I have heard of the standards before, but I don't really have a deep understanding. What I know is that they have some code of conducts for all teachers. So, as teachers, we are expected to follow these laid down procedures and code of conducts. -* ***Male, class C school, mixed-sex***

- *"I know it is about the ethics of teachers in their profession. In other words, the dos and don'ts of teachers in that profession. But, if you say good understanding of the National Teacher's Standards, I will say I am still learning about that, and I will not say I have good understanding of the guide. You know well that teachers must continue to learn, and I cannot claim to know everything."* ***- Male, class B school, mixed-sex***

- *In my little knowledge, I think I'm demonstrating the NTS if I prepare my lesson very well before delivery. A teacher is supposed to give exercises, class tests and assignments. I make sure I mark all the exercises I give to students. As a guidance coordinator, I also organise moral talks to the students for change of behaviour. These days, it's difficult for students to respect but I do my best to talk to them.* ***Male, Class A school, single sex***

3.6.3 Teachers in SEIs using digital technologies

Output Indicator: Percentage of teachers in SEIs using ICT and digital technologies to enhance their teaching

This 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. In computing this indicator, three different assessment tools were used. First, sampled teachers were observed using or referencing digital technologies during lessons based on the measurement criteria. An interview was also conducted with teachers to triangulate the results of the lesson observation. Finally, students also completed a self-assessment test to triangulate the lesson observation results. For a teacher to meet the minimum criteria for this indicator, a minimum of 75 percent average score is required.

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.

None of the teachers met the minimum criteria for this indicator. Table 3.30 below shows the proportion of teachers who met the ICT and digital technology competency scores criteria from the lesson observation.

Table 3.29 Teachers who met the minimum criteria on lesson observation competencies (%)

	Overall
Relevance of ICT to curriculum and topic taught	5.4
The teacher uses digital technology to support learning in a multitude of ways, a hands-on approach for learners	0.3
The teacher gives appropriate ICT resources to students with special needs	14.3
Produces and uses a variety of teaching and learning resources that enhance learning, including ICT.	2.1
Total (N)	**391**

The study computed a multiple linear regression model to determine demographic variables significant to the output indicator score. Female teachers scored 2.3 percent lower than male teachers. Also, teachers in single-sex schools obtained a score of 6.3 percent lower than teachers in mixed-sex schools. Please see table 4.50 in annex 3.6 for the output results.

The survey sought to determine the proportion of teachers who have received training in digital technologies in their schools (table 3.30). The results show that about 23.9 percent of teachers have received training in digital technologies. The results also indicate that more teachers in class A (35.4 percent) schools have received training

on digital technologies than teachers in class C (22.7 percent) and class B (22.0 percent) schools. In terms of school type, a slightly higher proportion of teachers in mixed-sex schools (24.0 percent) have received training in digital technologies compared with teachers in single-sex (22.1 percent) schools.

Table 3.30 Proportion teachers who have received training in digital technologies in their schools (%)

Category	Percent
Sex of Teacher	
Male	23.3
Female	25.6
School Classification	
Class A	35.4
Class B	22.0
class C	22.7
School sex	
Mixed Sex	24.0
Single Sex	22.1
Years of Teaching	
Less than 5 years	21.1
5 to 10 years	24.9
More than 10 years	25.2
Overall	**23.9**
Total (N)	**1,453**

Qualitative insights into teachers' use of digital technologies

Most teachers lamented that their schools do not have adequate digital resources for teaching and learning, leading to their inability to adopt them in their teaching. Others indicated that they usually use their own digital resources for lesson preparation but do not use them during lesson delivery. According to them, it is the responsibility of the school authorities to provide all teaching and learning materials (TLMs), including digital technologies for their use. So, they are hesitant to use their resources on behalf of the school.

Interestingly, some teachers also explained that at the SEIs, the students are not allowed to use smartphones, laptops, and tablets. According to the teachers, without a working ICT lab, asking students to use digital technologies is untenable. Below are quotes from teachers relating to the use of digital technologies:

- *"No, the school has not provided any digital resources to support teaching, but I have been using my personal laptop which I paid for. I only use my personal laptop during lesson preparation but in the presentation and delivery, there are no such resources like projectors to make the lesson delivery successful."* - ***Male, class B school, mixed-sex.***
- *"Our school lack such resources such as computers and projectors and it has also made me dormant in the presentation of lesson using projectors for instance, so, I think if the school is well-equipped with such digital resources, as teachers, we will take advantage to learn more in using them to support the lesson delivery."* - ***Male, class B school, mixed-sex***

- *"We don't have digital resources in the school. It is just recently I have gotten a laptop under the one teacher, one laptop project. During lesson preparation, I sometimes use my mobile phones to search for solutions to difficult question that I encounter." –**Female, class A school, single-sex***
- *"We have no laptops or computers. It is only markers that we have been provided with by the school. But if I find it difficult to understand certain things when I'm preparing my lesson plans, I use my phone to help me get a better understanding. "- **Female, class C school, mixed-sex***
- *"The school has some computers and laptops which were received a faith-based organization and some individuals from the church so as teachers we have access to it to help us research and prepare lessons. But the school don't have a projector, so I found it difficult to use digital technology to support me during lesson delivery." – **Male, class B school, single-sex***
- *"From the school's perspective, no they have not provided us with any digital resources to help us teach. However, there is an ICT Lab for the school so, if any teacher requests to use any of the computers to work, I don't think they will refuse. Personally, I am not a fan of technology and social media. However, I do google for certain things with my phone to prepare my lesson." - **Male, class A school, single-sex***
- *"The school has not provided us with us digital resources so I'm unable to use such resources to enhance my teaching. But as a science teacher, I use my phone to do some research before coming to teach in class." – **Male, class B school, single-sex***
- *"I don't use those types of technology like the projectors, computers and all that, I don't even know how to use them. Basically, I see those who teach at the tertiary levels to use resources like the projectors and all that, but I don't use them at my level. It is not even there but I also don't know how it is used." – **Female, class B school, mixed-sex***

Other challenges cited by teachers in the use of digital technologies are quoted below:

- *"Yes, I don't have in-depth knowledge in the digital technologies. I only have little knowledge in the Microsoft word and excel and a minute knowledge in the publisher." - **Male, class A school, single-sex***
- *"I have challenges in using digital technology because our school lack such resources like computers and projectors and it has also made me dormant in presentation of lesson using projector, so I think if the school is equipped with such resources, teachers will have the advantage to learn more in using such to support the lesson delivery. "– **Male, class B school, mixed-sex***
- *"Weak access to data connection, sometimes network challenges and no money to buy data for the school Wi-Fi." - **Male, class C school, mixed-sex***
- *"Some students love the fun of playing games at the expense of using it as a learning tool." – **Male, class B school, single-sex***
- *"Poor internet network is a big challenge. The internet might be down so when you are working with it you find it difficult to get the information that you are looking for. So, we have internet challenges with almost all the networks." – **Female, class B school, single-sex***

3.6.4 Teachers in SEIs demonstrating GESI-responsive pedagogies

Output Indicator: The proportion of teachers at SEIs demonstrating GESI-responsive pedagogy.

This indicator tracks teachers' demonstration of gender-responsive pedagogy using the criteria listed in box 3.3. In computing the indicator, three methods were employed to provide a composite score: lesson observation, a follow-up interview with the teacher, and self-administered questionnaires with students. A teacher is expected to obtain a minimum of 75 percent on the mean composite score to satisfy the criteria of the indicator.

Results in table 3.31 show that less than a tenth (8.7 percent) of teachers demonstrated GESI-responsive pedagogies. The results are similar across teacher and school demographics.

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
- Identifies and remediates learners' difficulties or misconceptions, referring learners whose needs lie outside the competency of the teacher
- Teacher use of age and grade(s) appropriate strategies to enact in the lesson

Table 3.31 Proportion of teachers at SEI demonstrating GESI-responsive pedagogy (%)

	Year 1	Year 2	Overall
Sex			
Male	8.8	6.6	7.6
Female	7.8	15.4	11.7
School classification			
Class A	0.0	11.4	6.3
Class B	9.8	4.5	7.0
class C	10.2	10.9	10.6
School sex			
Mixed sex	9.4	9.5	9.5
Single sex	0.0	0.0	0.0
Overall	**8.5**	**8.9**	**8.7**
Total (N)	**188**	**203**	**391**

Table 3.32 details the teacher competency scores on GESI-responsive pedagogies. Over 50 percent of teachers performed better on "creating a safe and encouraging environment". However, less than a tenth of the teachers performed well on "paying attention to all students, especially girls and those with special education needs (SEN)" and "employing instructional methods for mixed abilities".

Table 3.32 Teacher competency scores on GESI-responsive pedagogies (%)

	Male teacher	Female teacher	Overall
Creates a safe, encouraging learning environment	56.6	62.1	58.1
The teacher applies all teaching methods equally to female and male students	41.3	51.5	44.0
Understands how children develop and learn in diverse contexts and applies this in their teaching	43.4	41.8	43.0
Teacher use of age and grade(s) appropriate strategies to enact in the lesson	22.6	24.3	23.0
Identifies and remediates learners' difficulties or misconceptions, referring learners whose needs lie outside the competency of the teacher	22.9	20.4	22.3
The teacher uses gender responsive strategies to challenge gender roles and gender norms	11.1	15.5	12.3
Pays attention to all students, especially girls and students with SEN, ensuring their progress	6.6	7.8	6.9
Employs instructional strategies appropriate for mixed ability, multilingual and multi-age classes	6.6	7.8	6.9

Although some teachers understand GESI, they seemed to be heavily challenged to implement the competencies when teaching. Some teachers indicated that they are challenged in demonstrating GESI-pedagogy due to limited knowledge, female students' shyness, and the perception that they will be tagged as being inappropriately involved with female students. Only few teachers indicated that they understand GESI-responsive pedagogy to mean applying teaching methods equally to students from all backgrounds including gender, special education needs, low-income groups etc. Below are some quotes from interviews.

- *"Some students don't take active participation in activities out of shyness especially girls so sometimes I ignore them" –* ***Male, class B school, single-sex***
- *"Due to the little understanding of the concept, there is less efficacy in implementing GESI–responsive pedagogy which is the biggest challenge." –* ***Male, class A school, single-sex.***
- *"GESI-responsive pedagogy demands a lot of time from the teacher. A teacher also needs to be dedicated to being able to do the work well. Where is the motivation to help the teacher in that direction? Low appreciation from both students and parents; a common thank you gladdens the heart of the teacher, isn't it? Resources to help cater for the needs of the challenged in the school is dreadful. I sometimes use my own vehicle to carry some students to the hospitals. The infrastructure in the school is not user-friendly for the physically challenged. I can go on and on." –* ***Female, class A school, single-sex***

- *"I will say shyness for both sex because mostly ladies feel shy. Almost all the classes that I teach the males are always more than the female. In a class where I have about five females and forty-five males definitely the ladies will always feel shy." –* ***Male, class C school, mixed-sex***
- *"I have some understanding of the gender-responsive pedagogy. It is giving equal opportunity to students to participate in class Activities especially girls. But since the school is a girl's school, I don't apply it. When it comes to social inclusion, that's where the problem is. Everybody has their own social and cultural background, but I don't know how to demonstrate social inclusion when teaching. –* ***Male, class B school, single-sex***
- *… I have good understanding I make sure questions are distributed fairly throughout the class during teaching and every student been male or female are treated the same. But the problem is that when you give more attention to the opposite sex, some of the students will tag you the teacher that you have something to do with the females [suggesting inappropriate relationship]. That is why sometimes we can't do more….* ***– Female, class B school, mixed-sex***
- *… I understand the GESI-pedagogy I have challenges applying sometimes with the girls, when it comes to the gender, when they see that you always pay attention to them, when they come to class, they always want you to be with them and they will be dragging the others behind. And for those with certain disabilities, when they see that you always favour them, they don't want to study because they know that in case of anything, they will be helped. And with the opposite sex, the other students may think that you have a special interest in them, and that one can discourage you. At times when they also see that you always pay attention to them, sometimes most of them also become relaxed and when you give assignment to them which they can do, they will intentionally not do thinking that you will pardon them because of their situation so sometimes too, it does not help them to involve themselves maybe practically in the class. –* ***Male, class C school, mixed-sex.***
- *"I have very little understanding of GESI. With the little understanding I have, I apply it by trying to vary my methodology to cater for the gender and social inclusion which ensures equality." –* ***Male, class A school, mixed-sex***

- *Yes, GESI-responsive pedagogy talks about achieving desired development outcomes of girls in a lesson. I apply it by using groupings in the classroom for activities taking into consideration gender balance and social integration. –* ***Male, class B school, mixed-sex***
- *"On a personal level, I have some understanding of Gender, Equality and Social Inclusion pedagogy. It helps to address the issue of some marginalized students like females and students with disabilities. I demonstrate GESI by giving my students moral talks and encouraging them to always put up their best and that "What a man can do, a woman can do it better." I always try to give the ladies special attention to let them feel that they can perform better than the boys academically if they position themselves to learn." –* ***Female, class C school, mixed-sex***
- *"Our school is for girls alone. So, there is nothing like gender equality here. But for social inclusion pedagogy, I know something small on that. I include everyone in my teaching. I encourage even pregnant girls to still come to school despite their conditions. Those who are not academically good I give them exercise to practice and sometimes provide extra tuition for them to catch up with their colleagues. I also*

encourage the students to respect one another in the classroom. These girls can be stubborn sometimes." – ***Male, class A school, single-sex***

- *"Yes, in every activity that I do, I always involve both genders and not necessarily that this is for girls or boys. If I ask a question it goes to both genders. If a male should answer a question the next question*
- *goes to the females. In classroom practice or arrangement, I always have male followed by female in that order. I do not allow males to sit at one side and females at the other end but rather I mix them." –* ***Male, class C school, mixed-sex***

3.7 Secondary education institution output indicator findings

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

Output indicator: Number of boards and senior management teams of secondary education institutions that demonstrate understanding of their roles and responsibilities and can provide evidence of how they are discharging them.

This indicator focuses on leadership and management of SEIs. The objective of the indicator is to evaluate whether the leadership of SEIs understand their roles and responsibilities and can demonstrate with evidence the execution of these roles. In computing the indicator, the study interviewed a member of the school board, headteacher and senior management staff. The data from the interviews were triangulated to establish commonality and scoring. Box 3.4 presents the criteria for determining the indicator score.

The results of the analysis reveal that 36.35 percent of the boards and school management teams demonstrated an understanding of their roles and responsibilities. Table 3.33 provides a detailed analysis of the areas where the school boards and management performed well and where they fell short.

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

Table 3.33 Proportion of boards and senior management demonstrating understanding of their roles and responsibilities (%)

	Male school heads	Female school heads	Overall
School class			
Class A	37.14	37.66	37.30
Class B	34.84	35.85	35.06
Class C	35.68	40.00	36.96
Overall	**35.52**	**38.61**	**36.35**

The results in table 3.34 reveal that over 80 percent of the boards and senior management teams developed vision and mission statements that align with GES.

Table 3.34 Competency scores for boards and senior management (%)

Competencies evaluated	Total
The school mission statement is shown	89.7
The school vision statement is shown	84.5
Setup student counselling services	56.7
The school has SIP or SPPP and has been shared and aligns with the vision	46.4
Have student engagement/performance targets in their SIP/SPPP or as a school	33.0
have in your SIP/SPPP leadership and management focused targets or does the school have leadership and management focused targets	30.9
have a Gender Equality and Social Inclusion (GESI) targets in your SIP/SPPP	29.9
have teaching and Learning targets in their SIP/SPPP or as a school	25.8
Have developed strategies to support the professional development of teachers	18.6
Have developed strategies to support improvements in student performance	17.5
The school board set up committees (finance, disciplinary, planning, academic) to address issues in the school.	15.5
Institutional Partnership/Community Engagement targets in your SIP/SPPP or as a school	14.4

Qualitative interviews with boards and senior management teams of SEIs reveal that some boards and senior management teams have not had any official training regarding their roles and responsibilities. Qualitative insights also revealed that some board members and senior management teams perceived their roles and responsibilities to be centred on issues such as identifying and resolving challenges facing schools, monitoring academic performance and administrative management. Some also indicated that they are responsible for resolving disciplinary issues among staff and students, ensuring a conducive school environment and supervision of academic and non-academic activities. Below are some quotes from boards and senior management members:

- *"My roles are to help monitor the academic performance of students. Their challenges, security issues, their welfare and output of teachers and their challenges as well as trying our possible best to solve them. I have not received any training." –* ***KII, board member***
- *"I have received several trainings but not as a board… For our roles, we monitor the administration and management of the school and support them in any possible way for effective administration of the school. "We also help to resolve issues in the school, disciplinary issues among the students and the staff. A report is normally reported to us, and we have an input. We discuss it as a board to arrive at a suggestion. Sometimes we even write letters to the regional director of education or to GES through the regional director. Sometimes we form a committee of the board to meet some staff who misbehave to help resolve issues among them for positive change." As a board chair, I liaised with the headmistress and the old girls and other stakeholders to see how we can support the school. Through the Old Girls*

Association - Canada Branch, some computers were procured and donated to support teaching and learning in the school." – ***KII board chairperson***

- *"Even though I have not received any formal training, I believe as a board member, it is my responsibility to help and ensure that we have a conducive environment for both students and staff to promote effective teaching and learning. "When results are released, we ask for the analysed results based on individual subjects, and we meet with staff members to discuss the downsides and the way forward. We sometimes advise students where necessary for an improved and better performance.*
- *"As a board, we support the school in various ways to ensure that the needs of students and the school are met. Recently, I lobbied through some benevolent people, philanthropists, and NGOs to help provide some desks for the school. Also, as a board member of the school and a former Assembly member I collaborated with the former MCE to get a Poly Tank and connection of water to the school." –* ***KII, board member***
- *"As the school head, I supervise and monitor the work as well as seek the welfare of both my students and staff, manage the school's finances and check on accountants for the judicious use of the school's financial resources, take proper care of the school properties and ensure effective teaching and learning is done." –* ***KII, headmaster***
- *"I am the general overseer of the school. I serve as a link between teachers and the students. I also receive feedback from teachers with regards to delegation of activities of assignment and ensure the welfare of the students." –* ***KII headmaster***
- *"As the headmistress of the school, I have several roles and responsibilities. Firstly, I supervise teaching and non-teaching staff. I am the spending officer of the school and I also take care of the school's infrastructure. I conduct monitoring and supervision of teachers, students, and non-teaching staff. I oversee admission of students and I admit teachers. I hold meetings and I am the head of all meetings that are held. When I am not around, I give the mandate to my immediate assistant head." –* ***KII headmaster***
- *"I supervise and manage the school entirely. I also act as the spending officer, overseeing the finances of the school. I do this by ensuring that things are done the right way. I also oversee the implementation of policies and act as the liaison officer between the students, parents and the school administration." –* ***KII headmaster***
- *"My role as the headmaster involves ensuring things are done effectively to achieve the set objectives of the school. It also includes the management of the material resources and finances of the school, ensuring effective teaching and learning and communicate and reporting back to the directorate and board members." –* ***KII headmaster***
- *"As the headmaster my role involves administrative work, overall supervision of academic, domestic and administrative activities in the school." –* ***KII headmaster***

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

Output Indicator: % of secondary education institutions with an inclusive, gender-sensitive environment for staff and students.

This indicator measures the extent to which secondary education institutions provide an inclusive and gender-sensitive environment for staff and students. In computing this indicator, responses from school management (including review of documentation) were triangulated with data from teacher lesson observations and student self-assessment questionnaires. The result reveal that 36.2 percent of the SEIs have an inclusive, gender-sensitive environment for staff and students.

Tables 3.35 presents the results from headteachers on the competencies for this indicator. While the scores for the headteachers are high, the triangulated scores from the students (table 3.36) and teachers (table 3.37) are low. This accounts for the low overall score for the indicator.

Box 3.6 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)

Table 3.35 Competency scores for an inclusive, gender-sensitive environment, by headteachers (%)

Competencies	Overall
Health and safety procedures in place for staff and students,	77.0
Gender-responsive infrastructure like washrooms and changing rooms etc.	77.0
A transparent reporting system for harassment	76.0
Recourse and reprimand for harassment	72.0
Infrastructure in the school accessible to all students (including those with special education needs)	68.0
Dedicated spaces/admission for students from disadvantaged backgrounds	44.3
Procedure in place to provide an inclusive and gender-sensitive environment for staff and students	44.3

Table 3.36 Competency scores for inclusive, gender-sensitive environment for staff and students, student triangulation results (%)

Competencies	Overall
Heard of actions being taken against someone who abused a student in your school	54.8
Aware of any channels in place to report sexual harassment and gender-based violence in the school	52.1
Aware of the existence of dedicated officers assigned to oversee reports on sexual harassment and gender-based violence in the school	50.2
Course structure promote GESI	36.8
Classroom Practice are GESI responsive	28.4
Teaching and learning materials (TLMs e.g., blackboard writing and drawing Charts, Posters, Maps, Diagrams, Graphs, Photographs) are GESI responsive	19.7
Infrastructure in the school is accessible to all students (including those with special education needs)	11.3

Table 3.37 Competency scores for inclusive, gender-sensitive environment for staff and students, teacher triangulation results (%)

Competencies	Overall
Creates a safe, encouraging learning Environment	40.9
The teachers apply all teaching methods equally to female and male students.	24.8
Understands how children develop and learn in diverse contexts and applies this in their teaching	10.5
Teacher use of age and grade(s) appropriate strategies to enact in the lesson	8.7
Identifies and remediates learners' difficulties or misconceptions, referring learners whose needs lie outside the competency of the teacher	4.6
The teacher uses gender responsive strategies to challenge gender roles and gender norms.	2.8
Pays attention to all students, especially girls and students with Special educational needs (SEN), ensuring their progress.	2.8
Employs instructional strategies appropriate for mixed ability, multilingual and multi-age classes.	2.8

The qualitative survey provided insight on how boards and senior management support their school to ensure an inclusive, gender-sensitive environment for staff and students. According to some boards and senior management staff, they have zero control over ensuring gender balance in the recruitment of teachers. They further explained that even though they sometimes make special requests to ensure a gender-balanced staff, these are not always followed through. Furthermore, some boards and senior management indicated that they make efforts to elect male and female school prefects to ensure balance in leadership among students.

The boards and senior management further pointed out that despite the Computerized School Selection and Placement System, the SEIs are given some allocation to admit students yearly. They stated that they take advantage to admit disadvantaged students and female students to ensure parity. Below are some quotes:

- "In the school, I realized that males are more than the females in terms of numbers and in positions. I took the opportunity to discuss with other board members to give priority to some females to be part of the board and heads of some departments." – **KII, board member**

- "We actually raised those views extensively during our meetings. We observed that, even though it's a girls' school, there are more male teachers than female teachers. That was what we inherited as a board. Even some of the house masters are men even though that was not good enough. We discussed with management, and we advised them that they start reducing some of the assurance letters to give to the male teachers and the vice versa. Because the school is well developed, most teachers want to teach in that school. The school is comparatively better than other schools in the Upper East region. We don't encourage male house masters leaving closer to the dormitories. It is creating problems among the wives of the teachers and the students. Some of the husbands of the female housemistresses are having the same challenge. Their wives suspecting them of having something to do with the students. As a board, we stepped in on several occasions and this is not helping the students. I was ever a housemistress in the school for 6 years and there is no sign of discrimination among the students. They are treated equally. That school was adopted by the catholic church, so, the first headmistress was a reverend sister. The students still try to live by those Christian values and as a board, we also encourage the school to include everyone in the school." – **KII, board member**

- "With the teaching staff, I don't have any control over inclusiveness because the government posts teachers to the school based on merit and performance. On the students, the community is given an equal slot for the admission of both boys and girls and the computerized system is also doing the rest. During lessons, teachers ensure that girls and boys understand what has been taught equally by calling on them to answer questions. Aside from teaching and learning, boys and girls do activities like sweeping and weeding as and when the need arises." – **KII headmaster**

- "Placement of students is done at the national level for which I have no control on, but what I usually do on my part regarding the protocol list they give is to also make sure 60 percent of the admissions are given to female students. I give that high percentage to encourage them." – **KII headmaster**

- "As for me, I am always gender-sensitive because my school though a single sex school, you come we have both male and female staff. Thus, both the teaching and non-teaching staff. I don't discriminate. On inclusion, I encourage my staff to be professional in dealing with students who are challenged in the school. For example, the disabled students who cannot walk well, we make sure their classes are allocated to the ground floor, you know some of our storey buildings are disability friendly. We bring the whole class to the ground floor so that those students will have access to classes. For students below average, we first, must identify the challenge that such students are facing; sometimes it could happen that the student has a hearing problem or cannot see well. When we identify the problem then we help such a student." – **KII headteacher**
- "The ratio between my girls and boys is 1:1. There are equal number of boys as there are girls in the school. Because of this, everything done in the school are done equally. Prefects are chosen equally (that is boys' and girls' prefect), equal number of debating boys and girls, and many more. In fact, even the girls are doing better than the boys due to the concentration that was we have places on the girl-child education years back. On the part of my staff, the men are more than the women in the ratio 1:2, and I believe it has more to do with

the insufficient teachers' bungalows on campus. That notwithstanding, the women hold more responsibilities than men. For example, there are two females and 1 male in the head teacher position." – KII headteacher

- "With the staff, though it male dominated, we give equal opportunities to all the staff regardless of their gender through encouraging and empowering female students to take up leadership roles in the school." – **KII headmaster**

3.7.3 Secondary education institutions providing services for their students

Output indicator: Percentage of secondary education institutions providing: (a) career guidance; (b) psychosocial and emotional counselling services; (c) academic counselling; and (d) have a link with industry and tertiary institutions

This indicator measures the percentage of SEIs providing various services to students in the schools.

Headteachers completed a questionnaire asking them whether their schools have full- or part-time counsellors (or counsellors that combine their counselling responsibilities with a full teaching workload) that routinely and regularly provide one-on-one:

(a) Career guidance, which 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.

Box 3.7 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

(b) Psychosocial and emotional counselling services that support the process of overcoming environmental, emotional, or social concerns; and,

(c) Academic counselling, which helps students acquire and apply effective and efficient study skills with the intention of improving students' academic performance.

The result was triangulated with students[20]. Further follow-up was done to verify the availability of the services at the schools.

Headteachers were also asked about the number of formal and active linkages with (a) industry and (b) tertiary institutions[21].

From table 3.38 below, half (53.2 percent) of the SEIs provide career guidance while about a third (36.2 percent) provide academic counseling. Few SEIs have links with industries and tertiary institutions. For SEIs who do not have links with industries and tertiary institutions, they explained that GES rules do not mandate them to sign contracts with private organisations or industries without permission, so it has not been a priority. They further explained that despite not going into official contracts, they receive support and donations from private organisations and industries, including old students' associations.

[20] students were asked to agree or disagree, using a likert scale with the following (or similar) statements: (a) "Counselling services at my school are a priority in supporting (i) my educational progress and (ii) my emotional well-being" and (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."

[21] When such linkages were identified, headteachers were asked how the linkages contribute to or enhance the learning environment. To validate these responses, the student questionnaire asked whether they are aware of any active linkages and, if so, how the linkages contribute to or enhance their learning environment.

Table 3.38 Percentage of SEIs providing services to their students (%)

	Career Guidance	Psychosocial and emotional counseling	Academic Counselling	Link with industry	Link with tertiary institution
School classification					
Class A	100.0	16.7	83.3	10.0	10.0
Class B	41.2	5.9	47.1	6.1	12.1
class C	50.0	0.0	16.7	9.3	13.0
Overall	**53.2**	**4.3**	**36.2**	**8.3**	**12.4**

3.7.4 Secondary education institutions demonstrating understanding and gender and inclusion practices

Output indicator: Percentage of boards and senior management teams of secondary education institutions that demonstrate understanding and implementation of strategy on gender and inclusion.

This indicator assesses the extent to which boards of SEIs and senior management teams demonstrate understanding and implementation of strategy on gender and inclusion. In computing this indicator, the study conducted KIIs with the boards of SEIs and triangulated the results with senior management teams.

From table 3.39 below, 37.11 percent of the boards and senior management teams demonstrated understanding and implementation of strategies on gender and inclusion.

Table 3.40 presents the raw competency results. About half of the board members and senior management teams demonstrated understanding and implementation on almost all the competencies.

Qualitative insights from board members further revealed that board members did not receive adequate orientation on GESI related strategies.

Box 3.8 Criteria for measuring gender and inclusion strategies

- SEIs have GESI targets in SIP/SPPP
- Infrastructure in school is accessible to all students
- TLMs are GESI responsive
- All school infrastructure is GESI responsive
- School syllabi promote GESI
- Assessment methods take GESI issues into consideration
- Teachers are skilled in addressing GESI issues
- Professional development strategies are GESI responsive
- Strategy for improving student performance GESI responsive

Table 3.39 Percentage of boards of secondary education institutions that demonstrate understanding and implementation of strategy on gender and inclusion (%)

	Male school heads	Female school heads	Overall
School class			
Class A	57.1	33.3	50.0
Class B	30.8	14.3	27.3
class C	47.4	25.0	40.7
Overall	**42.3**	**23.1**	**37.1**

Table 3.40 Competencies on boards understanding and implementing strategy on gender and inclusion (%)

Competencies	Overall
Infrastructure in school is accessible to all students	68.0
Professional development strategies are GESI responsive	65.0
Assessment methods/ approaches take GESI issues into consideration	63.9
Syllabi promote Gender Equality and Social Inclusion	59.8
Teachers are skilled in addressing GESI issues	57.7
School infrastructure is GESI responsive	54.6
TLMS are GESI responsive	49.5
SEIs have GESI targets in SIP/SPPP	29.9

4.0 DISCUSSION & IMPLICATION OF FINDINGS FOR POLICY AND PRACTICE

4.1 Discussion

In this section, we focus on discussion of key findings of the study. The discussion is organised around the themes of the research study.

Subject knowledge

Overall, SEI students obtained an average score of 47 percent on their skills and ability in reading, mathematics and science (subject knowledge). These results are consistent with perception of SEI graduates in terms of how they are well-equipped with subject knowledge. Also, the low demonstration of subject knowledge by SEI students and graduates was echoed by tertiary institution lecturers, and employers. Review of recent West African Senior School Certificate Examination (WASSCE) result shows that the observed trend is no different. For example, in the 2021 WASSCE results, 54 percent of students demonstrated subject knowledge.

21st century skills

The findings of the study show that 11 percent of students demonstrated proficiency in 21st century skills. The results are similar to the perception held by tertiary education lecturers and tutors in relation to the demonstration of 21st century skills by SEI graduates.

A recent review of the performance of secondary education from 2018-2021 emphasizes the need to equip SEI graduates with 21st century skills and competencies to enable them to meet the demands of further studies, the world of work and adult life. The review emphasized the need for a secondary education reform for Ghanaian SEI graduates to be globally more competitive in the quest to become a learning nation as indicated in the ESP 2018-2030.

The result of this study provides data that corroborates the review mentioned above. This underscores the need for and importance of T-SHEL's intervention in SEIs.

Display of core competencies in the NTS

The NTS are designed to improve the quality of teachers' delivery and students' performance and should therefore be used as a reference tool[22]. The Standards are clear expectations of skills that teachers should be able to demonstrate. Unfortunately, only 3 percent of the teachers understand and are demonstrating the NTS. This suggests the need for intensified education on the tenants of the NTS among teachers in SEIs in Ghana to improve learning outcomes for students.

Use of digital technology by teachers to enhance learning

The use of digital teaching and learning tools in classrooms increases student engagement, helps teachers improve their lessons, and facilitates personalized learning. It also helps students build essential 21st century skills. Using technology in teaching and learning increases collaboration and communication in the classroom, provides

[22] MOE (2017). National Teachers' Standards for Ghana: Guidelines. Accra: Ministry of Education (Ghana), Available online at www.t-tel.org/hub.html

personalized learning opportunities, sparks curiosity in the students and improves teacher productivity and efficiency[23]. Despite all these benefits, none of teachers observed during the survey were found to use digital technology to enhance their teaching.

Teacher motivation and retention

When a worker is motivated, it manifests in his or her agility, dedication, enthusiasm, focus, zeal and general performance and contribution to organizational objectives and goal[24]. Furthermore, work motivation is positively associated with job satisfaction[25] and teachers who are highly motivated are likely to be successful at their job. Teachers who are motivated are likely to go the extra mile to improve student performance and ensure that learning outcomes are achieved. The findings of the survey show that less than a tenth of teachers in SEIs are motivated and less than half (45 percent) want to remain in the teaching profession. The results are consistent with other studies which found that few teachers intend to stay in the teaching profession[26].

This low level of motivation among teachers has implication on students learning outcomes. To motivate teachers a number of strategies may be adopted. Studies on teacher motivation in Ghana identified issues such as salary, working conditions, incentives, medical allowance, security (future pension benefits), recognition, achievement, growth, students' indiscipline, school policy and status as important factors of motivation to teachers [27]. Since the teacher is both an embodiment of human capital and the channel through which the human resource of a nation is developed, their job satisfaction and motivation are crucial to the long-term growth and development of any educational system[28].

Demonstration of GESI-responsive pedagogy

The results of the study show that less than one-tenth of teachers in SEIs demonstrated GESI-responsive pedagogy. The NTS requires that every teacher is able to ensure equity and inclusion in their classroom, with emphasis on girls and other vulnerable groups[29]. This is currently not happening in SEIs in Ghana as seen from the study.

Understanding and implementation of strategy on gender and inclusion by senior management

The study also reveals that one-third of boards and senior management teams of SEIs demonstrate understanding and implementation of strategy on gender and inclusion.

The findings on the extent of provisioning of an inclusive, gender-sensitive environment for staff and students reveal that 36 percent of schools have an inclusive, gender-sensitive environment for staff and students.

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[23] Fard, A. (2022). Technology in education: How technology has benefited education. Available at

[24] Ifinedo, P. (2003). *Employee motivation and job satisfaction in Finnish organizations: a study of employees in the Oulu region* ,Finland. Master of Business Administration Thesis, University of London.

[25] Jerotich & Box, (2015). The Effect of the Level of Motivation of Kiswahili Teachers on Performance of Students in Secondary Schools in Elgeyo Marakwet County, Keiyo Sub-County, Kenya. *Journal of Education and Practice, 6* (29), 1 – 6. Also see, Ololube, N. P., (2006). Teachers job satisfaction and motivation for school effectiveness: An assessment. Retrieved from https://eric.ed.gov/?id=ED496539

[26] Spio SY (1999). High labour turnover among graduate teachers: Causes and solution. A dissertation presented to the School of Administration, University of Ghana, for award of MBA.

[27] Seniwoliba A. J. (2013). Teacher motivation and job satisfaction in senior high schools in the Tamale metropolis of Ghana. *Merit Research Journal of Education and Review, 1*(9), 181-196

[28] Ibid

[29] MOE (2017). National Teachers' Standards for Ghana: Guidelines. Accra: Ministry of Education (Ghana), Available online at www.t-tel.org/hub.html

Understanding and implementation of roles and responsibilities by senior management

The SEI boards are mandated to ensure effective governance and administration of secondary schools. The job of the governing body is to promote the best interest of the school to ensure that the learners at the school receive the best education possible. The boards in SEIs are also expected to help the school heads to organise and manage the school activities in an effective and efficient way.

School heads lead the academic activities of the school, provide leadership, oversee the implementation of policy directives, reports on the performance and progress of the school to the school board, regional education office, and the GES national office. In addition, the school head establishes school-community relationships and organises school-based in-service training for staff. These activities greatly promote teaching and learning. The survey findings reveal that only three out of every ten headteacher, board member and senior management understand and are performing their roles effectively.

Guidance and Counselling services

The findings from this baseline survey shows that fifty-three percent of the SEIs provide career guidance while about a third provide academic counseling. Also, less than five percent of the SEIs provides psycho-social and emotional counselling services to students.

Links with industry and tertiary institutions

Industry depends on SEIs to provide well educated and trained personnel while SEIs depend on industry to provide employment, guidance as well as financial support. This study found that less than 10 percent of SEIs have links with industry.

Similarly, links with tertiary institutions are also beneficial to SEIs. These benefits include professional development, access to technology and information to enhance teaching and learning. However, only few SEIs have links with tertiary institutions.

4.2 Recommendations for policy and practice on secondary education

Based on the findings of the study, the following recommendations are made for policy and practice.

Subject knowledge and 21st century skills

- Teaching and learning of mathematics and reading needs a critical overview to improve the students' demonstration of subject knowledge. Subject associations and GES can spearhead the training of teachers in these two areas.
- Twenty-first century skills are best demonstrated through practical activities. The education system needs to explore creative and innovative solutions that allow the harnessing of national and international resources to promote the acquisition of 21st century skills in SEIs.

Teachers

1. The NTS handbook should be supplied to SEI teachers (both hard and soft copies). Professional learning sessions should be organised in the schools to promote the discussion, understanding and use of the NTS during lessons.

2. SEI teachers should be trained on the use of GESI-responsive pedagogy in their lessons. This should be done through weekly professional learning sessions in the schools. GES and MoE should develop a National SEI GESI Strategy which can form the basis for the development of individual SEI GESI action plans.
3. Teachers should be trained with respect to the 21st century skills so that they will be able to incorporate them in their teaching.
4. GES and MoE should make attempts to improve SEI teachers' conditions of service. In this regard, there should be a review of the salary and conditions of service of SEI teachers.

School management

a. GES should organize leadership and management training for the boards, headteachers and senior management of SEIs. The training should focus on guiding SEI leadership to understand their role and providing them tools to implement these roles.
b. GES should resource the schools to set up guidance and counselling units. The schools should also be oriented on the importance of partnership and cooperation particularly with industry and tertiary institutions.
c. Schools should be encouraged to provide an inclusive, gender-sensitive environment for staff and students. Regional, Metro, municipal and district directors of education should supervise the creation of this environment for the SEIs.
d. Textbooks should be reviewed to ensure that they are GESI compliant.

ANNEX

Annex 1: Indicator scoring rubrics

Indicator scoring rubrics.zip

Annex 2: Final Data collection tools

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

Data Collection Tools.zip

Annex 3

Annex 3.1

Figure 3.10 Regional sex distribution of SEI graduates

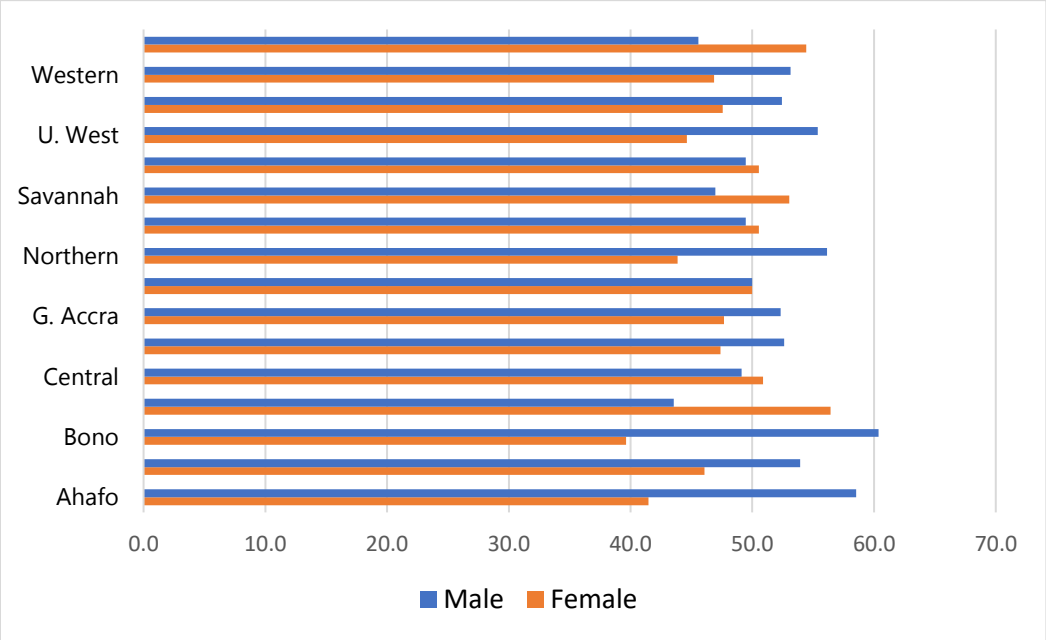


Figure 3.11 Regional distribution of employers

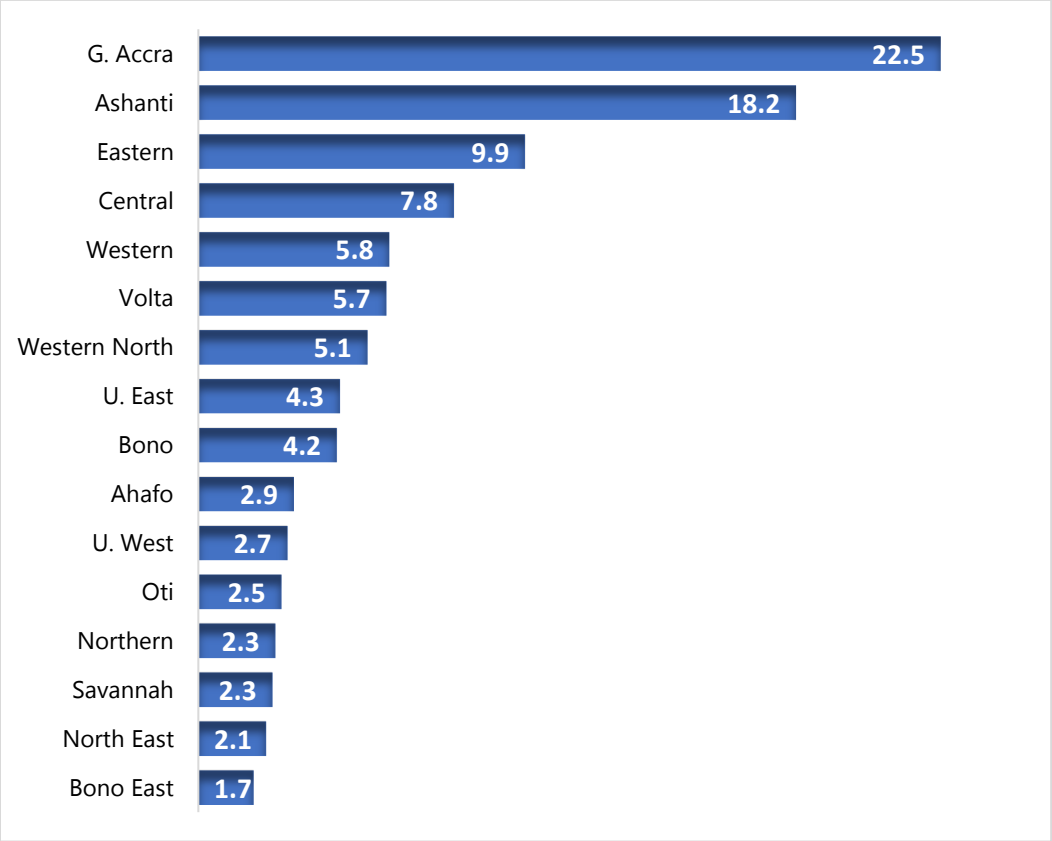


Figure 3.12 Highest level of educational attainment of employers

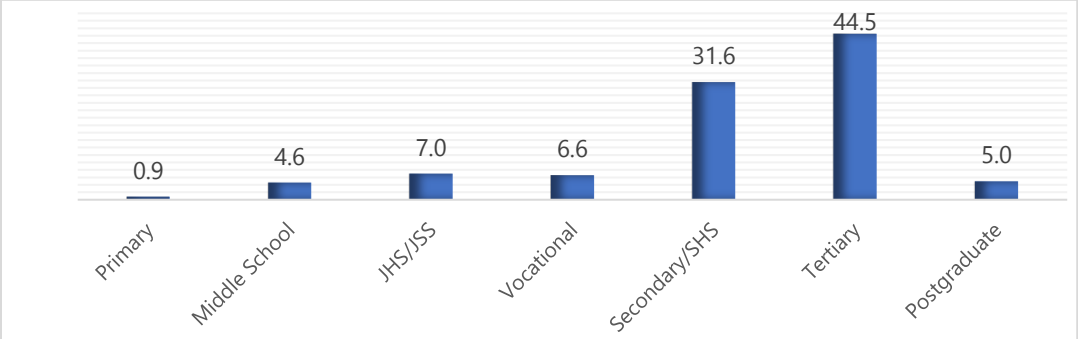
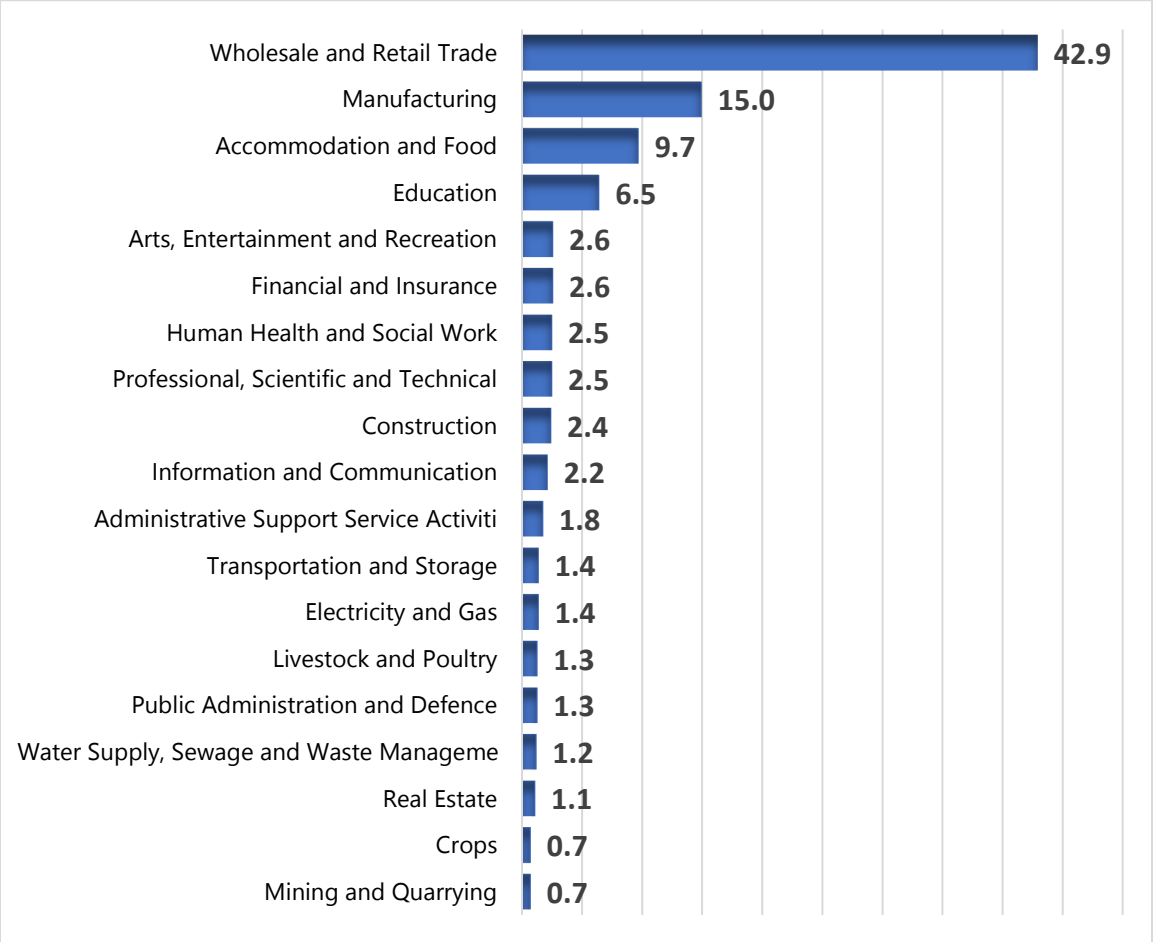


Figure 3.13 Sector of employer businesses



Annex 3.2

Table 3.43 Student performance by demographics and level of students

	Reading		Science		Mathematics		21st century skills	
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
Sex								
Male	47.17	46.50	46.84*	47.72*	47.63	48.18	54.66	58.42*
Female	48.12	48.20	44.23	45.71	45.79	46.56	54.08	56.41
School gender type								
Mixed	46.88	46.78*	44.75	45.70	46.72	47.46	53.94	56.81
Single sex	55.66*	46.11	52.55*	54.15*	46.63	47.20	60.15*	64.62*
Region								
Northern belt	46.97*	48.14*	44.93	46.4	45.23	46.80	48.70	53.79
Middle belt	42.23	41.26	46.35	47.39*	44.78	46.25	56.28*	59.06*
Southern belt	50.74*	49.63	45.71	46.45*	49.17*	48.79	55.50*	57.01*
School classification								
Class A	56.15*	55.62	52.55*	54.15*	58.50	49.19	60.09*	63.54*
Class B	47.39*	46.36	45. 57*	46.07*	46.26	47.87	55.41*	56.97*
class C	46.16	46.91	44. 35	45.52	46.66	46.94	52.99	56.28
School gender type								
Mixed	46.88	46.78*	44.75	45.70	46.72	47.46	53.94	56.81
Single sex	55.66*	46.11	52.55*	54.15*	46.63	47.20	60.15*	64.62*

* P≤0.05

Table 4.44 Quartile analysis by level and sex of students

	Year 1		Year 2		Overall	
	Male	Female	Male	Female	Male	Female
Numeracy Literacy						
1st Quartile	36	34	38	38	34	34
2nd Quartile	50	46	58	48	48	48
3rd Quartile	58	58	48	58	58	56
IQR	22	24	20	20	20	22
Reading Literacy						
1st Quartile	38	40	38	40	38	40
2nd Quartile	48	48	47	48	48	48
3rd Quartile	56	58	54	58	56	58
IQR	18	18	16	18	18	18

Scientific Literacy						
1st Quartile	38	36	40	36	40	36
2nd Quartile	48	34	48	46	48	46
3rd Quartile	56	52	56	54	56	54
IQR	18	16	16	18	16	18
21st century skills Literacy						
1st Quartile	48	46	54	50	50	48
2nd Quartile	56	56	60	68	68	56
3rd Quartile	62	64	66	54	54	64
IQR	14	18	12	14	14	16

Annex 3.3

Table 3.45 Mean percentage composite score of graduate students' agreement level, by sex

Subjects	SEI Graduates in school		SEI graduates at home		SEI graduates employed		Total	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Subject knowledge	76.92	75.99	75.15	75.10	77.38	75.92	76.43	75.66
21st century skills	77.38	77.18	77.19	76.62	78.58	77.70	77.69	77.14
Foundation Knowledge	76.49	75.81	75.41	75.24	77.67	76.18	76.48	75.72
Numeration	76.04	73.67	74.51	73.74	75.85	74.07	75.43	73.81
Literacy	77.45	77.38	75.53	75.92	78.30	77.03	77.03	76.77
Financial Literacy	72.67	73.20	72.11	73.60	75.50	75.13	73.37	73.92
Cultural identity, civic literacy, and global citizenship	82.99	83.43	83.38	81.95	84.05	84.49	83.47	83.23
ICT and Digital literacy	72.68	70.31	71.46	70.55	74.22	69.59	72.73	70.18
Competencies	76.63	76.53	76.25	75.79	77.48	76.11	76.76	76.15
Critical thinking and problem solving	76.18	74.39	75.36	75.10	77.22	74.82	76.21	74.77
Innovation and creativity	75.09	74.87	74.95	73.89	75.88	75.31	75.29	74.66
Collaboration	78.78	79.25	78.69	78.61	79.40	78.58	78.94	78.82
Communication	76.79	78.62	90.00	.	83.81	80.00	77.06	78.63
Character qualities	78.65	78.80	79.29	78.29	79.98	79.92	79.30	78.96
Discipline and integrity	78.11	79.18	78.81	78.03	80.39	80.28	79.08	79.11
Self-directed learning	77.34	77.06	78.70	78.18	79.33	78.83	78.46	77.98
Self-confidence	81.25	82.57	81.93	81.36	83.50	83.68	82.21	82.48
Adaptability and resourcefulness	75.61	74.80	75.40	74.39	76.10	75.73	75.69	74.93
leadership	77.63	77.21	78.00	76.46	78.67	78.22	78.09	77.25
Responsible citizenship	82.32	82.54	83.30	81.90	82.31	83.32	82.67	82.55
Total (N)	**399**	**399**	**442**	**393**	**390**	**337**	**1,231**	**1,129**

Table 3.46 Rotation matrix of 49 survey questions of graduate SEI students

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Uniqueness
Taught us to always explain the reasoning behind any idea	0.1131	0.2189	0.3559	0.294	0.0787	**0.5563***	0.4106
Taught us to apply what we learn in mathematics to our daily lives	0.1247	0.2083	0.1663	0.2198	0.1232	**0.697***	0.3641
Taught us to present our thinking or reasoning using mathematics.	0.0917	0.2581	0.0908	0.2298	0.2852	**0.6212***	0.3967
Taught us to read and understand the meaning conveyed in an extended passages of text	**0.5534***	0.1018	0.2428	0.1039	0.1889	**0.5053***	0.3226
Taught us to evaluate the quality of information in a piece of text i.e., whether the information is up-to-date and/or unbiased	**0.5415***	0.1018	0.1766	0.1264	0.2761	**0.5179***	0.3048
Taught us to evaluate the credibility of information in a piece of text i.e., whether the information is valid or accurate.	**0.5193***	0.1281	0.1084	0.1467	0.2818	**0.5396***	0.3101
Taught us to reason logically	**0.5274***	0.2477	0.2967	0.1586	0.0999	0.4143	0.3657
Taught us to present arguments in a convincing way	**0.5155***	0.135	0.2454	0.1566	0.2215	0.4054	0.4179
Taught us how to manage our income and expenses	0.1566	0.1327	0.316	0.2249	**0.7548***	0.1408	0.218
Made us to understand the importance of savings and investment	0.1685	0.1403	0.323	0.2274	**0.7466***	0.1643	0.2115
Showed us how to create wealth	0.0953	0.1999	0.0455	0.3334	**0.7294***	0.2152	0.2594
Taught us to respect the rights of other citizens or persons from other ethnic background.	0.1779	0.0643	**0.7725***	0.1317	0.1605	0.2335	0.2698

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Uniqueness
Taught us to perform our civic responsibilities as citizens of Ghana	0.1795	0.064	**0.7994***	0.1077	0.1953	0.157	0.2503
Taught us to respect cultural differences	0.1599	0.0955	**0.7632***	0.1933	0.1482	0.1888	0.2878
Taught us to search for information on the internet to improve our learning experiences	0.2964	0.135	0.2384	**0.587***	0.1107	0.2246	0.4299
Taught us to solve technical problems using modern technologies	0.1328	0.203	0.0967	**0.761**	0.2094	0.1595	0.2835
Taught us to use computers to solve problems	0.1392	0.1698	0.0722	**0.704***	0.2599	0.1524	0.3602
Taught us to be more open-minded when analysing alternative views.	0.3378	0.2741	0.3716	**0.5024***	0.0655	0.1965	0.3774
Taught us to think critically about the world around us when trying to solve problems	0.2564	0.3079	0.2806	**0.5635***	0.1059	0.2695	0.3594
Taught us to be curious about the world around us	0.1983	0.3338	0.1867	**0.5353***	0.2212	0.2552	0.4138
Taught us to learn how to approach difficult problems from different angles	0.3637	0.2977	0.1976	**0.505***	0.2324	0.2049	0.3891
Taught us to develop new ideas that can impact on others.	0.2317	0.295	0.2372	**0.5932***	0.2968	0.0392	0.3615
Taught us to strive to find out how things work	0.2903	0.2761	0.1387	**0.5967***	0.2717	0.0574	0.3871
Taught us to create things that are original and recognised by many people	0.2505	0.2848	0.0372	**0.5893***	0.3603	0.0902	0.3695
Taught us how to effectively work with diverse teams	**0.5047***	0.1722	0.2102	0.4631	0.181	0.1314	0.407
Taught us how to work in groups to come up with joint solutions to a problem or task.	**0.6556***	0.1397	0.2414	0.3257	0.1873	0.103	0.3406
Taught us to value individual contributions during group project	**0.6492***	0.1307	0.2782	0.3376	0.092	0.1293	0.3449
Taught us to articulate our thoughts effectively using oral, written, and nonverbal communication skills	**0.5875***	0.2274	0.1928	0.3211	0.1529	0.2156	0.393
Taught us to express our ideas effectively	**0.5802***	0.3467	0.3052	0.248	0.0366	0.168	0.359

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Uniqueness
Taught us to communicate effectively in a diverse environment.	**0.5008***	0.3297	0.3575	0.3213	0.053	0.1241	0.3913
Taught us to stand firm with our decisions even if persuaded.	0.4008	0.4028	0.2527	0.2116	0.3502	0.0845	0.4386
Taught us to set clear goals for our learning	**0.5212***	0.3912	0.3209	0.206	0.1626	0.0424	0.4016
Taught us to strive to achieve our personal goals that we set.	**0.5196***	0.4068	0.3299	0.2135	0.1935	0.0744	0.3671
Taught us to solve problems on our own	0.4381	0.4681	0.2825	0.2243	0.1688	0.0664	0.426
Taught us to effectively organise our studies at our own pace	0.4971	0.4094	0.3287	0.1416	0.1962	0.0085	0.4187
Taught us to develop our own procedures for solving complex problems	0.3378	0.4593	0.1226	0.3585	0.3536	0.1272	0.3901
Taught us to believe in our own qualities	0.3373	0.4303	0.4751	0.2341	0.0895	-0.0043	0.4126
Taught us to be confident when speaking to a wider audience	0.4389	0.4213	0.4796	0.1579	-0.0123	0.115	0.3616
Taught us to be proud of what we do.	0.3897	0.4155	**0.5513***	0.1494	0.0432	0.0358	0.3461
Provided us with ideas to catch onto any work we do quickly	0.1632	**0.5527***	-0.017	0.3608	0.3767	0.2205	0.3469
Taught us to welcome new challenges and find ways to overcome them	0.2797	**0.5894***	0.1502	0.3096	0.1657	0.2474	0.3672
Taught us to welcome new ideas and opportunities	0.2597	**0.5883***	0.2266	0.2655	0.173	0.2512	0.3716
Taught us to be innovative.	0.0456	**0.6993***	0.0998	0.3246	0.1522	0.2059	0.3281
Taught us to think strategically	0.1773	**0.6812***	0.1442	0.3125	0.1608	0.229	0.3078
Taught us to be self-confident in all areas we find ourselves	0.2787	**0.5898***	0.4267	0.1808	0.0503	0.1644	0.3301
Taught us to take up leadership positions in all areas we find ourselves	0.19	**0.5554***	0.3562	0.1744	0.1974	0.1062	0.4479
Taught us to learn to accept responsibility for our actions.	0.2425	0.4852	0.4684	0.0981	0.2734	0.0141	0.4019
Taught us to keep the environment clean	0.2748	0.2736	**0.6759***	-0.0092	0.1462	0.0322	0.3702
Taught us to engage in community labour activities	0.159	0.345	**0.5747***	0.1675	0.3201	-0.0242	0.3943

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Uniqueness
Eigenvalues	**22.897**	**2.720**	**1.847**	**1.602**	**1.283**	**1.065**	
Percentage of total variance	**0.4673**	**0.0555**	**0.0377**	**0.0327**	**0.0262**	**0.0217**	
Number of test measures	**13**	**7**	**6**	**10**	**3**	**6**	

*Factor loadings ≥0.5

Annex 3.6

Table 3.47 Output of multiple linear regression of teacher motivation

Characteristics	Coefficient	P-value	95% confidence interval
Gender			
Male	Reference		
Female	0.688	0.059	-0.027, 1.403
Trained and Certified			
Yes, trained, and certified	Reference		
Yes, trained only	-0.344	0.584	-1.580, 0.890
No	-0.490	0.471	-1.823, 0.843
School classification			
Class A	Reference		
Class B	-1.260	0.054	-2.543, 0.023
class C	-0.758	0.224	-1.980, 0.464
Years of Teaching			
Less than 5 years	Reference		
5 to 10 years	-1.320	0.002	-2.176, -0.465
More than 10 years	-0.770	0.053	-1.550, 0.010
School Sex			
Single	Reference		
Mixed	-0.784	0.292	-2.243, 0.675
Regional classification			
Northern Belt	Reference		
Middle Belt	0.524	0.258	-0.384, 1.432
South Belt	0.807	0.077	-0.086, 1.700

Table 3.48 Rotation matrix of 34 survey questions of SEI teachers

Variable	Factor 1	Factor 2	Factor 3	Uniqueness
Teaching is mentally draining.	-0.032	0.3713	0.0181	0.8397
With the help of my colleagues, we can solve student issues	0.2932	0.031	0.0607	0.751
I feel exhausted at the end of the school day	0.1344	0.6033*	-0.0034	0.5946
My pay as a teacher is insufficient to support my family	0.2079	0.4238	0.025	0.7061

Variable	Factor 1	Factor 2	Factor 3	Uniqueness
I feel fatigued when I get up in the morning and have to face another day at school	0.0184	0.6357*	-0.0048	0.5801
I have the ability to get parents involved in their children's education	0.1941	0.0512	0.139	0.74
I ask my colleagues for feedback.	0.1912	0.1322	0.0533	0.6848
With the help of my colleagues, we can identify innovative practices.	0.3308	0.0441	0.0617	0.6771
As a teacher, I'm given more responsibilities than I can manage	-0.0368	0.4512	0.0056	0.7208
Some teachers at my school want to transfer to another school	0.1172	0.2448	-0.1079	0.8046
I do not get paid on time.	-0.1403	0.1583	0.0622	0.8614
I can make my classroom a safe space for students, both emotionally and physically	0.4517	-0.0441	0.0947	0.6527
As a teacher, I am contributing positively to the lives of my students	0.4874	0.099	0.036	0.5767
I feel energized when my class greets me each morning	0.238	0.0322	0.1476	0.7622
If I had to choose again, I would still want to be a teacher	-0.0188	-0.1734	0.2041	0.65
My headteacher treat me with respect	0.234	0.0094	0.5517*	0.6126
My colleagues at school make work a fun place to be.	0.2093	0.0424	0.1534	0.8402
My headteacher praises me for my efforts in the school.	0.1635	0.0103	0.6455*	0.534
Parents value my work as a teacher	0.1104	-0.1046	0.4037	0.6757
I plan lessons with a colleague.	0.105	0.026	0.1524	0.7734
I feel confident about my abilities as a teacher	0.6046*	0.0464	0.1067	0.5816
If a student does not remember information in a previous lesson, I would know how to help them remember	0.6262*	0.0551	0.1183	0.5555
When a student gets a better grade than he or she usually gets, it is because I found a better way	0.4186	0.0721	0.1099	0.7011
If a student in my class is undisciplined, I know some techniques to direct him or her	0.5958*	0.0502	0.0998	0.5505
Every teacher can continue to improve their practice throughout their career	0.5934*	-0.0185	0.0761	0.6109
I can get through to even the most difficult or unmotivated students	0.5431*	0.014	0.0777	0.5734
I can motivate students who show low interest in school.	0.5262*	0.0574	0.0653	0.6359
I can influence some of the decisions that are made in the school.	0.0701	0.043	0.2194	0.7256
I can get students to work in groups or pairs	0.6091*	0.0387	0.0633	0.578
I ask my supervisor for feedback	0.2948	0.0434	0.2311	0.6325
I can help students overcome some difficult home and community conditions	0.3628	0.0369	0.1298	0.662

Variable	Factor 1	Factor 2	Factor 3	Uniqueness
Teachers in my schoolwork closely with the district SISOs (formerly circuit supervisors)	0.046	-0.0006	0.2574	0.7752
If I were offered another job outside the teaching profession at about the same or a slightly higher salary, I would accept that offer	0.0771	0.2592	-0.0756	0.6791
As a teacher, I am contributing positively to the lives of my students.	0.6126*	0.0639	0.0645	0.5375
Eigenvalues	4.204	1.548	1.313	
Percentage of total variance	0.4888	0.18	0.1526	
Number of test measures	8	2	2	

*Factor loadings ≥0.5

Table 3.49 Multiple Linear Regression output for teachers demonstrating understanding and application of the National Teacher's Standards (NTS)

Characteristics	Coefficient	P-value	95% confidence interval
Gender			
Male	Reference		
Female	0.610	0.610	-1.741, 2.961
School classification			
Class A	Reference		
Class B	5.345	0.004	1.745, 8.945
class C	-0.688	0.680	-3.972, 2.595
School Sex			
Single	-1.508	0.504	-5.938, 2.921
Mixed	Reference		
Regional classification			
Northern Belt	Reference		
Middle Belt	-10.755	0.000	-13.999, -7.510
South Belt	-5.783	0.000	-8.835, -2.731
Level			
Year 1	Reference		
Year 2	0.575	0.585	-1.492, 2.642

Table 3.50 Multiple Linear Regression output for SEI teachers using digital technologies to enhance their teaching

Characteristics	Coefficient	P-value	95% confidence interval
Gender			
Male	Reference		
Female	-2.274	0.013	-4.065, -0.482
School classification			
Class A	Reference		
Class B	2.520	0.072	-0.223, 5.264
class C	0.293	0.818	-2.209, 2.796
School Sex			
Single sex	-6.306	0.000	-9.681, -2.931
Mixed sex	Reference		
Regional classification			
Northern Belt	Reference		
Middle Belt	1.172	0.352	-1.301, 3.644
South Belt	2.075	0.080	-0.251, 4.400
Level			
Year 1	Reference		
Year 2	0.728	0.364	-0.847, 2.303