Annual Survey of Progress and Achievement

TRANSFORMING TEACHER EDUCATION AND LEARNING (T-TEL)

2019

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF BOXES

ACRONYMS AND ABBREVIATIONS

B.Ed	Bachelor of Education
CoE	College of Education
DBE	Diploma in Basic Education
EMS	English, mathematics, and science
FGD	Focus group discussion
ICT	Information, communication and technology
JHS	Junior high school
KII	Key Informant Interview
NAB	National Accreditation Board
NCTE	National Council for Tertiary Education
NTS	National Teachers' Standards
PTTPDMF	Pre-Tertiary Teacher Professional Development and Management Framework
SEN	Special education needs
QA	Quality assurance
TLM	Teaching and learning materials
T-TEL	Transforming Teacher Education and Learning

The findings as they relate to programme indicators are summarised in Table 1.0

TABLE 1.0: Indicators and results achieved

	Indicator	T-Tel Annual survey (June 2018)	Annual survey 2019 Targets	T-Tel Annual Survey (June 2019)
Beginning Teacher Indicators	**Outcome indicator 1.1**			
	Percentage of male and female beginning English, science, and mathematics teachers demonstrating core competencies in the Pre-Tertiary Teacher Professional Development Management Policy Framework	English – Male (38.2%); Female (32.9%) Mathematics – Male (31.5%); Female (30.0%) Science – Male (35.1%); Female (21.6%) Overall – (31.8%)	English – Male (40%); Female (40%), Science – Male (40%); Female (40%), Mathematics – Male (40%); Female (40%) Overall – 40%	English – Male (41.4%); Female (49.3%) Mathematics – Male (35.0%); Female (50.0%) Science – Male (43.2%); Female (35.1%) Overall – (41.7%)
	Outcome indicator 1.2			
	Percentage of male and female beginning English, science, and mathematics teachers demonstrating knowledge and application of basic school curriculum and assessment	English – Male 36.4%; Female (35.5%) Mathematics – Male (31.5%); Female (28.3%) Science – Male (37.3%); Female (23.5%) Overall – (32.5%)	English – Male (40%); Female (40%), Science – Male (40%); Female (40%), Mathematics – Male (40%); Female (40%) Overall – 40%	English – Male (39.3%); Female (42.5%) Mathematics – Male (36.3%); Female (46.2%) Science – Male (45.3%); Female (37.3%) Overall – (40.9%)
	Outcome indicator 1.3			
	Percentage of beginning male and female English, science, and mathematics teachers demonstrating gender-responsive instructional strategies	English – Male (21.8%); Female (21.1%) Mathematics- Male (16.3%); Female (16.7%) Science- Male (21.3%); Female (17.7%) Overall – (19.1%)	English – Male (30%); Female (30%) Science – Male (30%); Female (30%) Mathematics – Male (30%); Female (30%) Overall – 30%	English – Male (32.9%); Female (25.0%) Mathematics – Male (26.0%); Female (32.3%) Science – Male (37.0%); Female (32.1%) Overall – (30.7%)
	Output indicator 4.2A			
	Percentage of beginning teachers demonstrating an understanding and application of the National Teachers' Standards	*Indicator not measured in 2018*	*2019 target not set*	Male teachers (28.6%) Female teachers (31.7%) Overall (30.1%)
College of education Tutor indicators	**Output indicator 4.3**			
	Percentage of male and female English, science, and mathematics tutors demonstrating student-focused teaching methods	English – Male (74.6%); Female (71.4%) Mathematics – Male (86.3%); Female (78.6%) Science – Male (73.4%); Female (64.7%) Overall (76.9%)	English – Male (85%); Female (80%) Science – Male (80%); Female (70%) Mathematics – Male (90%); Female (80%) Overall – 85%	English – Male (80.0%); Female (83.3%) Mathematics – Male (72.6%); Female (84.2%) Science – Male (79.4%); Female (75.0%) Overall (78.0%)
	Output indicator 4.4			
	Percentage of male and female tutors using gender-sensitive instructional methods	English – Male (65.1%); Female (57.1%) Mathematics – Male (75.0%); Female (64.3%)	English – Male (75%); Female (65%) Science – Male (75%); Female (80%)	English – Male (81.2%); Female (86.1%) Mathematics – Male (76.4%); Female (84.2%)

	Indicator	T-Tel Annual survey (June 2018)	Annual survey 2019 Targets	T-Tel Annual Survey (June 2019)
		Science – Male (65.8%); Female (76.5%) Overall (68.0%)	Mathematics – Male (85%); Female (75%) Overall – 80%	Science – Male (76.5%); Female (85.0%) Overall (79.6%)
	Output indicator 4.2C			
	Percentage of tutors demonstrating an understanding and application of the National Teachers' Standards	*Indicator not measured in 2018*	*2019 target not set*	Male tutors (59.7%) Female tutors (61.3%) Overall (60.1%)
CoE Student indicator	**Outcome indicator 1.4**			
	Percentage of student teachers that demonstrate higher levels of expected graduate attributes identified in the curriculum writing guide	*Indicator not measured in 2018*	*2019 target not set*	Year 1 (B.Ed students) – (38.0%) Year 2 (Diploma students) – (40.4%) Overall (39.2%)
	Output indicator 4.2B			
	Percentage of student teachers demonstrating an understanding and application of the National Teachers' Standards	*Indicator not measured in 2018*	*2019 target not set*	Male students (35.0%) Female students (28.9%) Overall (31.9%)
Mentor Mentee indicators	**Output indicator 5.3A**			
	Percentage of mentors in partner schools that reinforce key components of the National Teachers' Standards	*Indicator not measured in 2018*	*2019 target not set*	Male mentors (34.9%) Female mentors (24.1%) Overall (29.7%)
	Output indicator 5.4			
	Percentage of mentees receiving support from mentors in the delivery of basic education curriculum using pedagogy in line with the National Teachers' Standards and reflective of gender- and student-responsive instruction	*Indicator not measured in 2018*	*2019 target not set*	Male mentees (26.1%) Female mentees (19.0%) Overall (23.0%)
Colleges of Education	**Output Indicator 1.3**			
	Percentage of colleges that ensure an inclusive, gender-sensitive environment for all staff and student teachers.	*Indicator not measured in 2018*	*2019 target not set*	Male Principals (21.9%) Female Principals (7.1%) Overall (17.4%)
	Output Indicator 5.1			

Indicator	T-Tel Annual survey (June 2018)	Annual survey 2019 Targets	T-Tel Annual Survey (June 2019)
Percentage of partner schools meeting minimum quality criteria	*Indicator not measured in 2018*	*2019 target not set*	Male-headed partner schools (44.7%) Female-headed partner schools (60.3%) Overall (50.0%)
Output Indicator 5.2			
Percentage of CoEs' partner schools that are inclusive and gender-sensitive	*Indicator not measured in 2018*	*2019 target not set*	Male principals (29.8%) Female principals (38.4%) Overall (32.7%)
Output Indicator 5.3B			
Percentage of mentors and head teachers in partner schools that reinforce key components of the National Teachers' Standards	*Indicator not measured in 2018*	*2019 target not set*	Male-headed partner schools (78.7%) Female-headed partner schools (71.2%) Overall (76.2%)

1.1 BACKGROUND TO THE T-TEL PHASE 2 ANNUAL SURVEY

Transforming Teacher Education and Learning (T-TEL) is a Government of Ghana Programme supported by the UK's Department for International Development and managed by Cambridge Education, a member of the Mott-McDonald Group. The programme's goal is to improve learning outcomes for children in primary and junior high school (JHS) across Ghana. This goal is to be realised through the achievement of the following outcome: Beginning teachers demonstrate better skills and practice, applying student-centred and gender-sensitive approaches to teaching and learning

For the past several years, T-TEL has collected data from its key stakeholders to monitor the progress of T-TEL against its expected outcomes. These stakeholders include principals of all the colleges of education (CoEs), student-teachers and tutors of mathematics, science, and English at the colleges, and beginning teachers and their mentors in kindergarten through JHS in public basic schools throughout Ghana. T-TEL has moved into the second phase of its programme in the 2018-19 and 2019-20 academic years and conducts an annual survey to assess the achievement of set targets. As a result, T-TEL commissioned this research to collect data from the stakeholders near the end of the 2018-19 academic year to gather data using the same or comparable instruments and sampling frames used during the previous surveys conducted for the same purposes to ensure that the samples are nationally representative.

1.2 T-TEL'S THEORY OF CHANGE

T-TEL aims to improve the quality of new teachers entering basic schools so as to improve the academic achievement of students. As T-TEL strives to improve on the quality of teacher education, it is expected that new teachers would teach as they have been taught, basing classroom lessons and instructional methods on the styles and strategies they have experienced in their own schooling or observed in the schools where they are teaching.

FIGURE 1.1 T-TEL's theory of change

OUTCOMES (LONG-TERM GOALS)

Beginning teachers capable of demonstrating four key practices that improve learning in basic schools

Core competencies in Pre-Tertiary Teacher Professional Development and Management Framework (PTTPDMF)

(Outcome Indicator 1)

Application of basic school curriculum

(Outcome Indicator 2)

Gender-sensitive instructional strategies

(Outcome Indicator 3)

Higher levels of expected graduate attributes in the Curriculum Writing Guide

(Outcome Indicator 4)

OUTCOMES (LONG-TERM GOALS)

T-TEL logframe output indicators that relate to key enabling factors

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Strengthened Institutional and Instructional Performance of CoEs

- CoEs effective in meeting National Accreditation Board (NAB's) and National Council for Tertiary Education (NCTE's) standards for tertiary institutions (1.1)
- CoEs meeting annual targets in College Improvement Plans (1.2)
- CoEs ensure an inclusive and gender-sensitive environment for all staff and student teachers (1.3)
- CoEs uses QuickBooks to manage funds and generate financial reports with clean audit trails (1.4)

National educational policy system enables implementation of teacher education reforms

- Annual roadmap of KPI targets in teacher education reform achieved by the Ministry of Education (MoE) with T-TEL support (2.1)
- Targets in transition support fund achieved by CoEs(2.2)
- CoEs with operational Colleges of Education Management Information Systems (2.3)

Strengthened quality assurance and regulatory system in place for CoEs

- Milestones in NCTE, NAB and National Teaching Council (NTC) capacity-building plans achieved by T-TEL
- Equity, inclusive and gender sensitive teaching and learning materials (TLMs) produced by universities CoEs

Curriculum reform implemented through teacher education universities and affiliated CoE

- Demonstration of understanding and application of the National Teachers' Standards (NTS)
- Demonstrating of student-focused teaching methods
- Use gender-sensitive instructional methods
- Achievement of NCTE target

Partner schools aligned with the new curriculum and delivering effective teaching and learning

- Partner schools assessed to be inclusive and gender sensitive
- Partner schools and district education officers that reinforce the teaching materials in NTS
- Student teachers receiving support from mentors in partner schools in the delivery of curriculum using pedagogy in line with NTS
- CoEs demonstrating supported teaching in schools is being implemented effectively in line with NTS

An assumption of the theory of change is that the quality of preservice education is affected by a number of factors operating at different levels of the educational system. Some of these factors are:

- Gaps and inconsistencies in teacher education policies that do not serve the sector well;
- Capacity of national institutions established to govern (quality assure) teachers' education as part of the tertiary education sector;
- Leadership and management skills of college principals and their teams;
- Teaching skills of tutors in CoEs, particularly in inclusive, student-centred pedagogies;
- Mentoring skills of mentors in the schools where student teachers[1] practice teaching (and particularly gender-responsive mentoring strategies and inclusive, student-centred pedagogies); and
- Diploma in Basic Education (DBE) curriculum used to train student teachers, which is overloaded with upper secondary subject content, exam driven, and not designed to deliver teachers with specialist skills at each level of basic education[2].

In response to this assumption, T-TEL is designed as a complex, multicomponent programme with a wide range of intervention strategies.

A further assumption is that interventions to improve tutors'[3] teaching skills will lead to changes in the teaching skills of student teachers even without any T-TEL interventions targeted at student teachers. This assumption is based on evidence that beginning teachers are strongly influenced by models of good practice that they experienced as pupils in schools and as students in colleges. As a result, T-TEL's outcome targets aim for improvements in beginning teachers' performance without direct interventions with student teachers. Therefore, the main areas in which T-TEL aims to catalyse change are:

- Tutors
- College leaders
- National policy, institutions, and curriculum
- Mentors[4] in partner schools[5]

1.3 T-TEL's Implementation Strategies

T-TEL is working closely with the Ministry of Education and the NCTE, in consultation with national-level institutions such as the Ghana Education Service, National Teaching Council, NAB, the National Inspectorate Board, five public universities and 46 CoEs. By 2020, T-TEL seeks to create the right conditions for a teacher education system that meets the needs of the country and benefits both teachers and pupils alike. This is to be realised through the implementation of the following key strategies illustrated in FIGURE 1.1.

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[1] Student teacher refers to first year students pursuing a B.Ed and second year students pursuing a DBE at a CoE.
[2] The levels of basic education are from primary one to JHS three.
[3] Tutors are teachers who teach at the CoEs.
[4] Mentors are experienced basic school teachers in partner schools who provide support and mentoring to third year students pursuing a DBE at a CoE.
[5] Partner schools are basic schools where CoEs send their student teachers for field practicums.

FIGURE 1.2 T-TEL implementation strategies

Enabling a positive policy environment around the implementation of the new curriculum and broader changes to national education outlined in the Education Strategic Plan.

Continue supporting all 46 colleges of education to become tertiary institutions delivering excellent teacher education
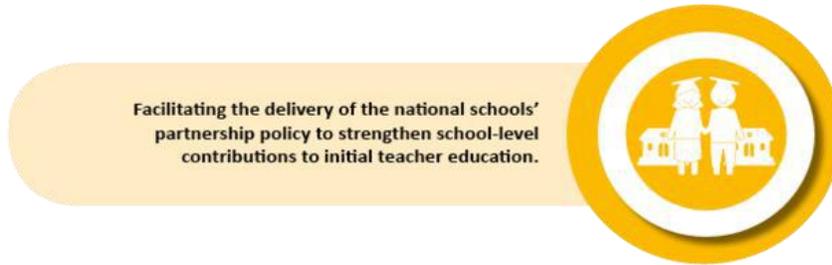
Facilitating the delivery of the national schools' partnership policy to strengthen school-level contributions to initial teacher education.

Supporting national education agencies and regulatory bodies to fulfil their roles in overseeing the teacher education reforms.

Strengthening institutional support to universities so they can better collaborate with CoEs to deliver the B.Ed curriculum.

2.2 SAMPLING DESIGN AND PROCESS

2.2.1 Sampling Process for Tutors and Student Teachers

As implemented during the 2018 annual survey, a multistage sampling procedure was adopted in the selection of the CoE tutors and student teachers for the annual survey. In the first stage, the 46 CoEs were stratified according to zones. To facilitate analysis of subgroups, CoEs were further stratified according to the sex composition of students (i.e., female-only CoEs, male-only CoEs, and mixed-sex CoEs). Similar to the methodology adopted for the phase 1 annual survey (2018), a deliberate effort was made to select mixed-sex CoEs for the survey. In this regard, 26 mixed-sex colleges, four females-only CoE, and one male-only CoE were randomly selected and included in the sample (see Annex 1).

In each CoE, an average of 12 English, mathematics, and science (EMS) tutors were randomly sampled from year one and two classes. Due to the low numbers of female tutors in CoEs, a deliberate effort was made to observe and interview all female EMS tutors in the sampled colleges. In total 368 tutors were observed teaching EMS and interviewed. Six student teachers (three males, three females) from a classroom of an observed tutor were randomly selected to participate in a student-teacher survey and key informant interviews using the lottery method. Unlike the 2018 annual study where self-administered questionnaires were administered, student teachers were individually interviewed to elicit detailed information to measure the 'proportion of B.Ed student teachers demonstrating higher levels of expected graduate attributes as indicated in the curriculum writing guide compared with diploma students.' In total, 2,208 interviews were conducted with student teachers.

2.2.2 Sampling Process for Mentors and Mentees

Mentors were sampled from partner schools in the districts in which the sampled CoE is situated. This was to reduce logistical costs. In each district (where CoE is located), an average of 16 mentors were interviewed given a total of 408 interviews. In doing so, the team collected the list of mentees and the names of partner schools in which they have been posted for field practicums from their respective CoEs. We then randomly selected mentees to interview in their respective schools using the lottery method. Per the T-TEL log frame, measuring of output indicator 5.3 requires that both mentors and mentees are observed during lessons delivery. Information from classroom observation was triangulated with respective mentors (if a mentee was observed) and mentee (if a mentor was observed). Sex consideration was factored in the sample selection to ensure the selection of both male and female mentors. Since both mentors and mentees are primary targets per the indicator requirements, one mentor and mentee were observed, and information triangulated with each other.

2.2.3 Sampling Process for Beginning Teachers and Pupils.

Similar to the methodology applied in past surveys, beginning teachers were sampled from the district where the sampled CoE is located. In urban districts, however, this did not work as beginning teachers are mostly posted to deprived districts and communities where teachers are in short supply. As was applied during the previous survey, the adjoining/nearer rural district in the same zone was considered if there were not enough beginning teachers in the sampled urban district (where the CoE is located). In sampling beginning teachers, the list of beginning teachers was collected from district education offices after which they were stratified by sex. Sixteen beginning teachers were randomly sampled for classroom observation and follow-up interviews using a lottery method. Having observed and interviewed beginning teachers, ten of their pupils (made up of five males and five females will randomly sampled using a lottery method to triangulate information collected during a classroom observation. See Table 2.1 for summary of sample allocations.

TABLE 2.1 Summary of sample allocation for quantitative survey

Target stakeholder	Tool	Target	Actual	Response Rate	Assumed Confidence Level (CL) and Margin of Error
Principals	Principal questionnaire	46	46	100%	Not Applicable
College secretaries	CoE Secretary interview Guide	46	46	100%	Not Applicable
Beginning teachers	Beginning teacher lesson observation	350	545	156%	(CL=95%, CI =±4.0%)
Tutors	Tutor lesson observation	368	368	100%	(CL=95%, CI =±4.0%)
Mentors	Mentor lesson observation	368	408	111%	(CL=95%, CI =±4.7%)
Mentees	Lesson observation	368	408	111%	(CL=95%, CI =±4.7%)
Pupils	Sleeping game	3500	4354	124%	(CL=95%, CI =±1.5%)
Student teachers	Student teacher interview questionnaire	2100	2208	105%	(CL=95%, CI =±2.0%)

2.2.4 Data Collection Method Per T-Tel Indicators

JMK developed tools the annual survey adopted to address each indicator. Table 2.2 shows the level at which measurement for each outcome and output indicators took place and the instruments deployed for data collection.

TABLE 2.2: Method for measurement of outcomes and intermediate outputs

Target stakeholder	Indicator	Level at which measurement took place	Tool/Mode of data-collection
Outcome Indicator 1 – Beginning teachers demonstrate better skills and practice, applying student-centred and gender-sensitive approaches to teaching and learning	Outcome Indicator 1.1 – Percentage of male and female beginning English, science, and mathematics teachers demonstrating core competencies in the Pre-Tertiary Teacher Professional Development Management Policy Framework	-- Basic school (Primary & JHS)	-- Lesson Observation -- Beginning Teacher Interviews -- Beginning Teacher Focus Group Discussion) FGD -- Pupil Sleeping Game
	Outcome Indicator 1.2 – Percentage of male and female beginning English, science, and mathematics teachers demonstrating knowledge and application of basic school curriculum and assessment	-- Basic school (Primary & JHS)	-- Lesson Observation -- Beginning Teacher Interviews -- Beginning Teacher FGD -- Pupil Sleeping Game
	Outcome Indicator 1.3 - Percentage of beginning male and female English, science, and mathematics teachers demonstrating gender-responsive instructional strategies	-- Basic school (Primary & JHS)	-- Lesson Observation -- Beginning Teacher Interviews -- Beginning Teacher FGD -- Pupil Sleeping Game
	Outcome Indicator 1.4 – Percentage of student teachers that demonstrate higher levels of expected graduate attributes identified in the curriculum writing guide	-- Colleges of education	-- Student Teacher Interviews -- Tutor interview
Output Indicator 1 – Strengthened Institutional and	Output Indicator 1.3 –	-- Colleges of education	-- Principal Key Informant Interviews (KII)

Target stakeholder	Indicator	Level at which measurement took place	Tool/Mode of data-collection
Instructional Performance of Colleges of Education	Percentage of colleges that ensure an inclusive, gender-sensitive environment for all staff and student teachers.		-- CoE Quality Assurance KII
Output Indicator 4 – Curriculum reform implemented through teacher education universities and affiliated CoE	**Output Indicator 4.2 -** Percentage of college tutors, beginning teachers demonstrating an understanding and application of the National Teachers' Standards	-- Colleges of education	-- Lesson Observation -- Tutor Interviews -- Tutor KII -- CoE Student Interviews -- CoE Student FGDs
	Output Indicator 4.3 – Percentage of male and female English, science, and mathematics tutors demonstrating student-focused teaching methods	-- Colleges of education	-- Lesson Observation -- Tutor Interviews -- Tutor KII -- COE Student Interviews -- COE Student FGDs
	Output Indicator 4.4 – Percentage of male and female tutors using gender-sensitive instructional methods	-- Colleges of education	-- Lesson Observation -- Tutor Interviews -- Tutor KII -- COE Student Interviews -- COE student FGDs
Output Indicator 5 – Partner schools aligned with the new curriculum and delivering effective teaching and learning	**Output Indicator 5.1 –** Percentage of basic schools within a CoE catchment area meeting CoEs' criteria to be considered a partner school	-- Basic school (Primary & JHS)	-- College of Education partner school metrics
	Output Indicator 5.2 – Percentage of CoEs' partner schools that are inclusive and gender-sensitive	-- Basic school (Primary & JHS)	-- Head teacher interview --Mentor lesson observation --Mentor interview
	Output Indicator 5.3 – Percentage of mentors and head teachers in partner schools that reinforce key components of the National Teachers' Standards	-- Basic school (Primary & JHS)	-- Mentor lesson observation -- Mentor follow-up interview --Mentor compliance matrix --Mentee follow-up interview --Head teacher interview
	Output Indicator 5.4 – Percentage of mentees receiving support from mentors in the delivery of basic education curriculum using pedagogy in line with the National Teachers' Standards and reflective of gender- and student-responsive instruction	-- Colleges of education	-- Mentor lesson observation -- Mentor follow-up interview -- Mentee lesson observation -- Mentee follow-up interview

2.2.5 College Management Survey

CoE principals and secretaries are the key stakeholders who responded to questions on institutional strengthening and instructional performance of CoEs. In this regard, the survey reached all the 46 CoEs to elicit the requite information to address the indicators in output 1. CoE stakeholders interviewed included:

Principals/vice principals, teaching and nonteaching staff, teaching practice coordinators (TPC) and supervisors. These stakeholders were reached with key informant interviews.

2.2.6 Other Qualitative Survey

To supplement the quantitative data, JMK also collected data to provide insight into how and why expected changes are or are not occurring[6]. In this regard, the team conducted qualitative data via FGDs and KIIs. FGDs and KIIs were carried out with tutors, student teachers, mentors, and mentees.

The qualitative survey explored issues around the programme's underlying assumptions to bringing about the expected change in behaviour of beginning teachers in using learner-centred and gender-sensitive approaches to teaching and learning. In particular, issues around organisation and attendance of tutors to professional development sessions, coaching support, mentors training, gender mainstreaming, the extent of support by CoE and school-level actors in implementing the new B.Ed curriculum, NTS and PTTPDMF policy, classroom conditions, motivation, and attendances, etc. were explored. Put in a different way, the qualitative survey assessed the extent to which the interventions introduced by T-TEL are being implemented, how and why. The sample frame in table 2.2 outline the target and actual sample size for the qualitative interviews.

TABLE 2.2: Summary of sample allocation for qualitative data collection

Target stakeholder	Tool	Target 2019	Actual	Response rate
Principals	Principal KII	46	46	100%
CoE secretaries	CoE Secretary and Quality Assurance (QA) KII	92	92	100%
Beginning teachers	Beginning teacher KII interview tool	350	545	156%
	Beginning teacher FGD Guide	10	10	100%
Tutors	Tutor interview tool	368	368	100%
	Tutor FGD Guide	10	10	100%
Student teachers	Student teacher interview guide	2,100	2,208	105%
	Student FGD guide	10	10	100%
Mentors	Mentor interview guide	368	408	111%
	Mentor FGD guide	10	10	100%
Mentees	Mentee KII Guide	368	408	111%
	Mentee FGD Guide	10	10	100%

2.3 DATA QUALITY CONTROL

A team of five supervisors was distributed across the T-TEL geographic zones. The field supervisors randomly visited the data-collection team in the regions assigned to observe the data-collection process to ensure that the enumerators were adhering to the survey protocols. The supervisors verified that nonresponses resulting from the field 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 the cross-referencing of observations and re-interviews with the original records recorded by enumerators. The data-management team at JMK cross-checked the observation and interviews conducted by the supervisor with the actual interview records to compute inter-rater reliability tests. A Kappa model generated 87.8 percent agreement for the tutor

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[6] Findings of the qualitative survey are presented in a separate report.

observation. The supervisors and quality assurance team provided technical support to the team if they found significant differences between the observation and interview records that the respective enumerator collected.

2.4 DATA MANAGEMENT AND ANALYSIS

The survey data were imported from the SurveyCTO platform and analysed by JMK using Stata® version 13 software. The Do File[7] feature of the Stata software allowed the 2019 annual survey data to be computed using the same computational procedure used for the 2018 annual surveys to ensure comparability of results. It is important to note that some computational procedures for some indicators were recomputed based on a review of those indicators prior to this survey (The changes are discussed under the specific indicators in the findings).

The data were analysed using descriptive statistical analysis to establish disaggregated scores for each data-collection tool. Data analysis and computation of indicator values were informed by scoring rubrics (See Annex 2). These scoring rubrics were developed to determine and make explicit, the *ideal* **scores** needed to be considered 'demonstrating' the specific practices or competencies highlighted in the log frame. For example, the composite score for outcome indicator 1 (Number and percentage of English, mathematics, and science male and female beginning teachers demonstrating interactive student-focused instructional methods) is an average of the three ideal scores that a teacher received for the student-focused components of the lesson observation, follow-up interview, and pupil interviews. If beginning teachers received the composite score needed to indicate that they had satisfactorily demonstrated student-focused methods, they are counted towards that indicator in the log frame. The requisite composite scores reflect what is ideal and required to substantively affect student learning (as opposed to a basic or minimum standard). Each of the scoring rubrics, along with the rationale for the ideal composite scores, were shared with T-TEL's key advisers for technical validation (see Annex 2 for documents on all the scoring rubrics).

For most key variables, t-tests were used to determine whether differences in the 2018 annual survey and 2019 annual scores were statistically significant at an alpha level ($p \leq 0.05$) Where there were differences among more than two groups, a Bonferroni multiple comparison tests at .05 was used to establish differences. For all differences noted in the report, an asterisk (*) has been used to indicate statistically significant differences between 2018 annual survey and 2019 annual survey scores. Also, for instances where there was a significant difference between male and female groups, two daggers (††) have been used to indicate statistical significance. And lastly, where significant differences exist between Year 1 and 2 college students[8], a double dagger (‡) has been used to signify significant differences. Significant difference tests were not conducted for indicators targeting CoEs. A triangle sign (∆) has been used to denote percentage change from annual survey 2018 to annual survey 2019. For all indicators that were computed in earlier surveys, the annual evaluation survey (October 2015) figures have been provided for reference purposes.

For each of the outcome indicators, a multiple regression analysis was conducted to determine the competencies that were significant in predicting the outcomes. (See Annex 4 for further details on the multiple regression analysis).

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[7] The Do File feature of Stata allows the saving of computational procedures for validation and future usage given the same variable names and analysis procedures.
[8] Year 1 students use the B.Ed curriculum and Year 2 students use the DBE curriculum.

showed 'excellent demonstration' using a cumulative scale on a 4-level Likert scale (0= Not observed, 1=Poor demonstration, 2=Satisfactory demonstration and 3= Excellent demonstration).

3.1 INTRODUCTION

This chapter presents the key findings of the 2019 survey. The subsections of this chapter address each of the outcome and output indicators. The findings are presented in order of change agents involved: beginning teachers, tutors, mentors, and college principals. This ensures a smooth flow of the report rather than using the numerical order of the indicators. This report begins with a summary description of the demographic characteristics of stakeholders and then provides further analysis of indicator findings by change agents involved. As required by the T-TEL log frame, the data have been disaggregated by sex and the main subjects of interest – English, mathematics, and science.

3.2 DEMOGRAPHIC PROFILE OF KEY RESPONDENTS

3.2.1 Demographic Profile of Beginning Teachers

Table 3.1 shows the demographic characteristics of beginning teachers observed and interviewed. In total, 545 beginning teachers were observed and interviewed. The distribution of beginning teachers is evenly split across subjects. Thus, 35.4 percent constitute science teachers, followed by mathematics teachers (33.0 percent) and English teachers (31.6 percent). A majority of beginning teachers sampled teach in JHS (43.5 percent), and the least in lower primary (25.1 percent).

TABLE 3.1: Demographic characteristics of beginning teachers (%)

Subject of Beginning Teachers	Male	Female	Overall
English	27.1	36.2	31.6
Mathematics	37.1	28.7	33.0
Science	35.7	35.1	35.4
Class of Beginning Teachers			
Lower Primary	10.0	41.1	25.1
Upper Primary	35.4	27.2	31.4
JHS	54.6	31.7	43.5
Total (N)	**280**	**265**	**545**

NOTE: Detail may not sum to totals due to rounding.

3.2.2 Demographic Profile of Tutors

Table 3.2 shows the demographic characteristics of tutors observed and interviewed. About eight out of ten tutors observed and interviewed (79.6 percent) were male with the remaining being female; this reflects the disproportionately higher number of male tutors versus female tutors in CoEs in Ghana. Also, the distribution of tutors sampled in colleges was even across subjects with a third of tutors representing English, mathematics, and science. About half of female tutors interviewed teach English (48.0 percent) while the majority of male tutors teach mathematics.

TABLE 3.2: Demographic characteristics of tutors (%)

Subject of Tutors	Male	Female	Overall
English	29.0	48.0	32.9
Mathematics	36.2	25.3	34.0
Science	34.8	26.7	33.2
Level of Tutors	**Male**	**Female**	**Overall**
Year 1	47.1	53.3	48.4
Year 2	52.9	46.7	51.6
Proportion of male and female tutors	79.6	20.4	100.0
Total (N)	**293**	**75**	**368**

NOTE: Detail may not sum to totals due to rounding.

3.2.3 Demographic Profile of CoE Students

Among the 2,208 student teachers surveyed, females constituted about half (51 percent) of the sample. See Table 3.3.

TABLE 3.3: Demographic characteristics of CoE students (%)

Sex of CoE Students	Male	Female	Overall
Year 1	48.5	50.6	49.0
Year 2	51.5	49.4	51.0
Proportion of male and female tutors	49.0	51.0	100.0
Total (N)	**1,081**	**1,127**	**2,208**

3.2.4 Demographic Profile of Mentors

Table 3.4 provides a demographic profile of the mentors sampled. The male mentors sampled for this survey were slightly more than half (51.2 percent) while the remaining were females (48.8 percent). About 38.7 percent of the mentors surveyed teach English, followed by 29.9 percent and 31.4 percent who teach mathematics and science, respectively. A majority of male mentors interviewed teach mathematics while the majority of females teach English. Also, the majority of male mentors teach in JHS (49.8 percent) while a majority of female mentors teach in lower primary.

TABLE 3.4: Demographic characteristics of mentors (%)

Subject of Mentors	Male	Female	Overall
English	27.3	50.8	38.7
Mathematics	40.7	18.6	29.9
Science	32.1	30.7	31.4
Class of Mentors			
Lower Primary	8.6	43.7	25.7
Upper Primary	41.6	31.7	36.8
JHS	49.8	24.6	37.5
Proportion of male and female tutors	51.2	48.8	100.0
Total (N)	**209**	**199**	**408**

NOTE: Detail may not sum to totals due to rounding.

Among mentees interviewed, males represented 57.4 percent, while females make up 42.6 percent. A majority of male mentees (41.9 percent) teach mathematics while a majority of female mentees (39.7 percent) teach English. See Table 3.5.

TABLE 3.5: Demographic characteristics of mentees (%)

Subject of Mentees	Male	Female	Overall
English	20.1	39.7	28.4
Mathematics	41.9	29.9	36.8
Science	38.0	30.5	34.8
Class of Mentees			
Lower Primary	15.8	35.1	24.0
Upper Primary	39.7	39.1	39.5
JHS	44.4	25.9	36.5
Proportion of male and female tutors	57.4	42.6	100.0
Total (N)	**234**	**174**	**408**

NOTE: Detail may not sum to totals due to rounding.

3.2.5 Demographics of College Management and Head Teachers of Partner Schools

As shown in Table 3.6, college principals and other management staff are predominantly male dominated. About seven of ten college principals are male, and about nine of ten college secretaries or quality assurance officers are male. Also, a majority of head teachers of partner schools interviewed were male (65.9 percent).

TABLE 3.6: Demographic characteristics of CoE management & partner schools (%)

Position	Male	Female	Overall	Total (N)
Principals	69.6	30.4	100.0	46
College secretaries/ QA officers	91.3	8.7	100.0	46
Head teachers of partner schools	65.9	34.1	100.0	214

3.3.1 Demonstration of Core Competencies in Pre-tertiary Teacher Professional Development and Management (PTTPDMF)

Outcome Indicator 1.1 Percentage of male and female beginning English, science, and mathematics teachers demonstrating core competencies in PTTPDMF

(Target for English, mathematics and science male and female beginning teachers is 40 percent in 2019)

The PTTPDMF is focused on issues that relate to teacher development and management of pretertiary education. The PTTPDMF seeks to enable teachers to function effectively at the basic and secondary levels and to develop and nurture teachers to become reflective and proficient practitioners. Contained in the PTTPDMF policy document are competency-based frameworks and professional standards that all teachers are expected to exhibit.

In assessing the demonstration of these competencies, beginning teachers were observed during EMS lessons against specific competency areas exhibited in Box 3.1.

The scores from the demonstration of core competencies were generated using defined scoring rubrics (see Annex 2.1). The composite score for this indicator is the average of the scores of the lesson observation, interview, and pupil game tools.

Results presented in Table 3.7 show no statistically significant increment for male beginning teachers in demonstrating core competencies in PTTPDMF. For female beginning teachers, the results show statistically significant improvement by 15.1 percentage point from 2018 to 2019 in demonstrating core competencies in PTTPDMF. Across subjects, the highest significant improvement was recorded by female

Box 3.1: List of core competence in PTTPDMF assessment domains
- The teacher uses strategies to open the lesson
- The teacher uses strategies to provide clear explanations for new concepts, knowledge or skills
- The teacher uses different TLMs to facilitate learning
- The teacher asks pupils a range of questions during the lesson
- The teacher uses strategies to assess pupils' understanding
- The teacher gives constructive feedback on pupils' answers, work or effort
- The teacher uses techniques to address mixed abilities
- The teacher uses strategies to effectively manage a class (especially a large class)
- The teacher pays attention to the seating arrangements in the classroom
- The teacher has a clear, high-quality lesson plan for parts of the lesson

mathematics beginning teachers (20.0 percentage point change). This is followed by female English beginning teachers and science beginning teachers who recorded significant improvements by 16.4 and 13.5 percentage points respectively, in demonstrating core competencies in PTTPDMF. The 2019 target set for this indicator has been achieved by female beginning teachers, but male teachers fell short slightly. (See Annex 3.1 for the beginning teacher competency scores for all the indicators).

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[9] Beginning teachers are newly posted teachers who have graduated from a CoE.

TABLE 3.7: Beginning teachers demonstrating core competency in PTTPDMF by sex and subject area (%)

Subjects	Annual survey (Oct-2015)	Annual survey (Jun-2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	2.5	38.2	41.4	+3.2
Mathematics	0.0	31.5	35.0	+3.5
Science	4.9	35.1	43.2	+8.1
Total	2.4	34.2	39.6	+5.4
Total (N)	**210**	**222**	**280**	
Subjects	Annual survey (Oct-2015)	Annual survey (Jun-2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	0.0	32.9	49.3	+16.4*
Mathematics	0.0	30.0	50.0	+20.0*
Science	1.6	21.6	35.1	+13.5*
Total	0.6	28.9	44.0	+15.1*
Total (N)	**160**	**187**	**265**	

* p≤0.05

The study further analysed the proportion of beginning teachers demonstrating core competencies in PTTPDMF based on the level they teach. As shown in Table 3.8, male beginning teachers in lower and upper primary reported significant improvement from 2018 to 2019 by 24.1 and 12.9 percentage point respectively. However, male beginning teachers in JHS reported a statistically significant decline by 9.2 percentage point in demonstrating core competencies in PTTPDMF. For females, a statistically significant improvement was more pronounced for those female beginning teachers in the lower primary with a percentage increase of 28.9 percentage points. This is followed by a significant improvement for female beginning teachers in upper primary. Female beginning teachers in JHS, however, reported statistically significant decline in demonstrating the PTTPDMF.

TABLE 3.8: Beginning teachers demonstrating core competency in PTTPDMF by sex and level (%)

Levels	Annual survey (Oct-2015)	Annual survey (Jun-2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Lower Primary	1.1	23.7	47.8	+24.1*
Upper Primary	2.5	35.1	48.0	+12.9*
JHS	5.0	42.0	32.8	-9.2*
Total	2.4	34.2	39.6	+5.4
Total (N)	**210**	**222**	**280**	
Levels	Annual survey (Oct-2015)	Annual survey (Jun-2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Lower Primary	3.1	24.0	52.9	+28.9*
Upper Primary	0.0	22.6	41.5	+18.9*
JHS	0.0	50.0	37.5	-12.5*
Total	0.6	28.9	44.0	+15.1*
Total (N)	**160**	**187**	**265**	

* p≤0.05

Analysis of the competency scores reveals that beginning teachers are unable to obtain a higher score on the PTTPDMF to satisfy the requirements of the indicator. This may be attributed to teachers not paying attention to the seating arrangement of pupils in the classroom. To ensure a higher score, teachers must ensure that girls and

boys as well as vocal and quiet pupils are equally mixed throughout the classroom. Also, children who need more support or have some form of disability should be sitting at the front seats in the classroom.

A multiple regression analysis was conducted to determine the competencies that are significant in predicting this indicator. For this analysis, the outcome (ideal or not ideal) was used as the dependent variable and all competency scores (classroom observation, teacher interview and pupil game) related to the indicator were used as the predictor variables. The results reveal that overall, 11 of 27 competencies were significant in predicting the outcome of this indicator. Also, about 76 percent (R-squared[10]) of the variability in the outcome is explained by the competencies. The regression analysis was also intended to determine which competencies had significant influence on the outcome. The results further revealed that classroom observation scores (R-squared value of 21.2 percent) had the most significant influence on the outcome while the competency with the least effect on the outcome was pupil game scores (R-squared value of 3.5 percent). Please see Table 4.1 in Annex 4 for the output including specific competencies that were significant in predicting the outcome of this indicator.

3.3.2 Demonstration of the Application of Basic School Curriculum

> **Outcome Indicator 1.2 Percentage of male and female beginning English, science, and mathematics teachers demonstrating knowledge and application of basic school curriculum and assessment.**
>
> **(Target for English, mathematics and science male and female beginning teachers is 40 percent in 2019)**

In assessing this indicator, beginning teachers were observed during English, mathematics, and science lessons against specific competencies highlighted in Box 3.2. Similar to outcome indicator 1.1, the composite scores for the application of basic school curriculum were generated using scoring rubrics (see Annex 2.1). The scoring rubrics benchmark deployed in the analysis is the ideal score, which is the score recognised to be the level required to demonstrate the application of the basic school curriculum. This benchmark score represents beginning teachers who scored at least 36 points on classroom observation, 21 points on the teacher interview, and 40 points on the pupil interviews.

Table 3.9 shows minor improvement in male beginning teachers' ability to demonstrate the application of basic school curriculum but not statistically significant. Similar results of no significant change were recorded across subjects. Female beginning teachers reported a significant improvement in demonstrating the application of basic school curriculum from 30.0 percent in 2018 to 41.5 percent in 2019. Across subjects, female mathematics and science beginning teachers witnessed improvements by 17.9 and 13.8 percentage points respectively from 2018 to 2019 in demonstrating the application of basic school

Box 3.2: List of basic school curriculum assessment domains
- The teacher uses effective strategies to provide clear explanations for new concepts, knowledge or skills
- The teacher uses different interactive methods/activities to facilitate learning
- The teacher uses different strategies to assess pupil understanding
- The teacher uses strategies to close the lesson
- The teacher has a clear, high-quality lesson plan for different parts of the lesson

curriculum. The 2019 target for this indicator was achieved. See Annex 3.1 for competency scores.

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[10] Detailed explanation of the key terminologies are provided in Annex 4

TABLE 3.9: Beginning teachers demonstrating the application of basic school curriculum by sex and subject area (%)

Subjects	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	2.5	36.4	39.3	+2.9
Mathematics	0.0	31.5	36.3	+4.8
Science	4.9	37.3	45.3	+8.0
Total	2.8	34.7	40.3	+5.6
Total (N)	**210**	**222**	**280**	

Subjects	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	3.1	35.5	42.5	+7.0
Mathematics	0.0	28.3	46.2	+17.9*
Science	1.7	23.5	37.3	+13.8*
Total	1.3	30.0	41.5	+11.5*
Total (N)	**160**	**187**	**265**	

*p≤0.05

Discussions with beginning teachers revealed that two main challenges have resulted in less than half of beginning teachers attaining the requirement for the indicator. These are unavailable or limited TLMs needed during lessons and difficulty identifying strategies that should be adopted to assist pupils with learning disabilities. Some teachers further indicated that due to these key challenges, they feel inadequate in providing the support pupils require.

The study also sought to measure the proportion of teachers demonstrating the application of basic school curriculum based on the level beginning teachers teach. As shown in Table 3.10, the results show statistically significant improvement for male beginning teachers in upper primary, but significant decline was also recorded for male beginning teachers in JHS. Female beginning teachers showed statistically significant improvement in lower and upper primaries. However, a significant decline was recorded in JHS. Also, significantly more male teachers in upper primary were found to demonstrate the application of the school curriculum compared with females at the same level.

TABLE 3.10: Beginning teachers demonstrating the application of basic school curriculum by sex and level (%)

Levels	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Lower Primary	2.1	28.8	36.4	+7.6
Upper Primary	3.1	31.9	56.2††	+24.3*
JHS	0.0	43.5	31.4	-12.1*
Total	2.8	34.7	40.3	+5.6
Total (N)	**210**	**222**	**280**	

Levels	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Lower Primary	3.3	25.0	55.1	+30.1*
Upper Primary	0.0	28.3	36.8	+8.5*
JHS	0.0	44.7	32.4	-12.3*
Total	0.7	30	41.5	+11.5*
Total (N)	**160**	**187**	**265**	

*††; *p≤0.05*

A multiple regression analysis was conducted to determine the competencies that are significant in predicting this indicator. For this analysis, the outcome (ideal or not ideal) was used as the dependent variable and all competency scores (classroom observation, teacher interview and pupil game) related to the indicator were used as the predictor variables. The results reveal that overall, 8 of 15 competencies were significant in predicting the outcome of this indicator. Also, about 74 percent (R-squared) of the variability in the outcome is explained by the competencies. The regression analysis was also intended to determine which competencies had significant influence on the outcome. The results further revealed that classroom observation scores (R-squared value of 34.0 percent) had the most significant influence on the outcome while the competency with the least effect on the outcome was pupil game scores (R-squared value of 2.6 percent). Please see Table 4.2 in Annex 4 for the output including specific competencies that were significant in predicting the outcome of this indicator.

3.3.3 Demonstration of Gender-Sensitive Instructional Methods

Outcome Indicator 1.3 Percentage of beginning male and female English, science, and mathematics teachers demonstrating gender-responsive instructional strategies.

(Target for English, mathematics and science male and female beginning teachers is 30 percent in 2019)

Prior to this survey, the wording of indicator 1.3 was revised. The indicator presently measures the proportion of beginning teachers demonstrating gender-sensitive instructional methods. In assessing the demonstration of these instructional methods, beginning teachers were observed during EMS lessons against specific competencies highlighted in Box 3.3. Similar to the previous outcome indicators, the composite scores from the demonstration of gender-sensitive instructional methods were generated using scoring rubrics (see Annex 2.1).

Box 3.3: List of gender-sensitive instructional domains
- Application of all teaching methods equally to male and female students
- Use of gender-responsive strategies to challenge gender roles and gender norms
- Having clearly paid attention to the seating arrangement in the classroom

The scoring rubrics benchmark deployed in the analysis is an ***ideal*** **score**, which is the score recognised to be the level required to demonstrate gender-sensitive instructional methods. This benchmark score represents beginning teachers who scored at least 24 points for classroom observation, 10 points in the teacher interview, and 32 points in the pupil interviews.

Survey results presented in Table 3.11 indicate statistically significant improvement for male beginning teachers between 2018 and 2019 in demonstrating gender-sensitive instructional methods. In terms of subjects taught, male beginning teachers, teaching science (37.0 percent), English (32.9 percent) and mathematics (26.0 percent) all showed significant improvement between 2018 and 2019. Also, female beginning teachers teaching mathematics and science reported significant improvements. The 2019 target was achieved by male beginning teachers, but female beginning teachers fell short by a slight margin. The overall target of 30 percent was achieved. A key reason for a higher proportion of teachers not meeting the target based on the competency scores for this indicator is the lack of supervision by teachers in ensuring that the seating arrangement of boys and girls are mixed during lesson delivery.

TABLE 3.11: Beginning teachers demonstrating gender-sensitive instructional methods by sex and subject (%)

Subjects	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	1.2	21.8	32.9	*+11.1*
Mathematics	0.0	16.3	26.0	*+9.7*
Science	0.0	21.3	37.0	*+15.7*
Total	0.4	19.4	31.8	*+12.4*
Total (N)	**210**	**222**	**280**	

Subjects	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	3.1	21.1	25.0	*+3.9*
Mathematics	0.0	16.7	32.3	*+15.6*
Science	0.0	17.7	32.1	*+14.4*
Total	0.6	18.7	29.5	*+10.8*
Total (N)	**160**	**187**	**265**	

*$p \leq 0.05$

The survey also assessed beginning teachers' performance in demonstrating a gender-sensitive instructional method based on the level taught. As depicted in Table 3.12, male beginning teachers in upper (21.5 percent) and lower primary (10.6 percent) levels witnessed significant improvement from 2018 to 2019. Similarly, female beginning teachers in upper (17.5 percent) and lower primary (16.1percent) recorded significant improvement from 2018 to 2019 by more than 15 percentage point each.

TABLE 3.12: Beginning teachers demonstrating gender-sensitive instructional methods by sex and level (%)

Levels	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Lower Primary	0.0	15.3	25.9	*+10.6*
Upper Primary	0.0	17.0	38.5	*+21.5*
JHS	0.7	26.1	28.6	*+2.5*
Total	0.4	19.4	31.8	*+12.4*
Total (N)	**210**	**222**	**280**	

Levels	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Lower Primary	0.0	20.0	36.1	*+16.1*
Upper Primary	0.0	13.2	30.7	*+17.5*
JHS	1.4	23.7	21.6	*-2.1*
Total	0.6	18.7	29.5	*+10.8*
Total (N)	**160**	**187**	**265**	

*$p \leq 0.05$

A multiple regression analysis was conducted to determine the competencies that are significant in predicting this indicator. For this analysis, the outcome (ideal or not ideal) was used as the dependent variable and all competency scores (classroom observation, teacher interview and pupil game) related to the indicator were used as the predictor variables. The results reveal that overall, six of ten competencies were significant in predicting the outcome of this indicator. Also, about 85.6 percent (R-squared) of the variability in the outcome is explained by the competencies. The regression analysis was also intended to determine which competencies had significant

influence on the outcome. The results further revealed that classroom observation scores (R-squared value of 47.4 percent) had the most significant influence on the outcome while the competency with the least effect on the outcome was pupil game scores (R-squared value of 0.5 percent). Please see Table 4.3 in Annex 4 for the output including specific competencies that were significant in predicting the outcome of this indicator.

3.3.4 Demonstration of Application of the National Teachers' Standards

Output Indicator 4.2A Percentage of beginning teachers demonstrating an understanding and application of the NTS

(Target for beginning teachers is 70 percent in 2019)

Ghana has reformed and restructured its teacher education system in response to demands of a new vision and mission for education to meet the demands of a knowledge society in which the teacher is an agent of change. What has been missing in this entire process is a National Teachers' Standards (NTS).

The Standards are designed to codify what a 'good teacher' looks like for Ghana, recognising the urgent need to improve the quality of the school experience and learning outcomes for all learners and to raise the status of teachers in their communities and country. The Standards are aspirational in their vision, positively embracing the promises and challenges of the 21st century for Ghana. The NTS for Ghana provides the standards for both preservice and in-service teachers.

Box 3.4: National Teachers' Standards
The NTS provides a definition of and a key reference point for the work of teachers towards achieving the learning and social outcomes articulated in the 2008 Education Act.

The annual survey sought to determine the proportion of beginning teachers that demonstrate an understanding and application of the NTS. Results presented in Table 3.13 shows that 30.1 percent of beginning teachers understand and demonstrate the application of the NTS. Across subjects, 32.1 percent of science teachers demonstrated application of NTS. The 2019 target for this indicator was not achieved.

TABLE 3.13: Beginning teachers demonstrating the application of NTS by sex and subject (%)

Sex	English	Mathematics	Science	Total
Male	25.0	26.9	33.0	28.6
Female	34.4	29.0	31.2	31.7
Total	30.2	27.8	32.1	30.1
Total (N)	**172**	**180**	**193**	**545**

The survey also sought to ascertain the proportion of teachers demonstrating the application of the NTS based on the level they teach. See Table 3.14.

TABLE 3.14: Beginning teachers demonstrating the application of NTS by sex and level (%)

Sex	Lower Primary	Upper Primary	JHS	Total
Male	21.4	35.4	25.5	28.6
Female	38.5	30.6	23.8	31.7
Total	35.0	33.3	24.9	30.1

| Total (N) | 137 | 171 | 237 | 545 |

A multiple regression analysis was conducted to determine the competencies that are significant in predicting this indicator. For this analysis, the outcome (ideal or not ideal) was used as the dependent variable and all competency scores (classroom observation and teacher interview) related to the indicator were used as the predictor variables. The results reveal that overall, ten of thirty-five competencies were significant in predicting the outcome of this indicator. Also, about 80 percent (R-squared) of the variability in the outcome is explained by the competencies. The regression analysis was also intended to determine which competencies had significant influence on the outcome. The results further revealed that classroom observation scores (R-squared value of 20.0 percent) had the most significant influence on the outcome. Please see Table 4.4 in Annex 4 for the output including specific competencies that were significant in predicting the outcome of this indicator.

3.3.5 Guttman Scaling of Classroom Observation Questions

For this analysis, the hierarchy of items was based on 'excellent demonstration' during classroom observation. The results reveal that the top three competency that were hierarchically on top were 'Teacher dressed neatly, modestly and decently'. This was followed by 'Teacher arrives in class on time for lessons' and lastly 'Teacher creates a warm and friendly learning environment'.

The three least competencies that received excellent demonstration are 'Teacher uses examples (in exercises or activities) that challenge or reverse traditional gender roles', 'Teacher points out and discusses traditional gender roles that appear in books/materials' and 'Teacher uses tablets, phones and other digital resources when teaching'.

3.4 TUTOR OUTPUT INDICATOR FINDINGS

3.4.1 Demonstration of Student-focused Teaching Methods by College Tutors

Output Indicator 4.3 Percentage of male and female English, science, and mathematics tutors demonstrating student-focused teaching methods

Annual survey 2019 target for

- **Male English tutors is 85 percent and female tutors is 80 percent**
- **Male Mathematics tutors is 90 percent and female tutors is 80 percent**
- **Male Science tutors is 85 percent and female tutors is 70 percent**

Indicator 4.3 of T-TEL Phase 2 measures the share of tutors who demonstrate student-focused teaching methods during the delivery of lessons. Box 3.5 provides teaching strategies tutors are expected to exhibit to facilitate effective learning. To measure the tutors' application of student-focused teaching strategies, three methods were employed to provide one composite indicator: lesson observations, follow-up interviews with tutors, and self-administered questionnaires for ten of

Box 3.5: Student-focused teaching domains

- Use of different interactive methods
- Range of questions
- Promotes whole group discussion
- Group/pair work
- Use of assessment strategies
- Gives constructive feedback
- Use of strategies for mixed abilities

the observed tutors' students based on the scoring rubrics (see Annex 2.2). The scoring rubrics benchmark deployed in the analysis is an ***ideal* score**, which is the score recognised to be the level required to demonstrate competency in the use of student-focused teaching methods. This benchmark represents the average of tutors who scored at least 64 points for classroom observation, 35 points in the teacher interview, and 88 points for student interviews. This score represents the minimum required competency for this indicator.

Based on the measurement of this indicator, Table 3.15 shows a significant reduction in the proportion of male mathematics tutors applying student-focused teaching methods.

For female tutors, the results do not show a significant improvement in the proportion of tutors demonstrating the use of student-focused teaching methods. The results also show the 2019 target for EMS male tutors has not been achieved but was achieved by female EMS tutors. (See Annex 3.2 for the tutor competency scores for the indicators).

Based on results from observed competency scores, slightly over a third of tutors use strategies to close lessons. Specifically, 'asking students questions to gauge their understanding of the lesson' and 'reviewing of core concepts and skills taught during the lesson.' An improvement in these competencies by tutors may improve the proportion who satisfy the indicator.

TABLE 3.15: Tutors demonstrating the use of student-focused teaching methods by sex and subject (%)

Subjects	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	23.3	74.6	80.0	+5.4
Mathematics	28.6	86.3	72.6	-13.7*
Science	26.0	73.4	79.4	+6.0
Total	26.4	78.4	77.1	-1.3
Total (N)	**220**	**222**	**293**	
Subjects	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	36.7	71.4	83.3	+11.9
Mathematics	22.2	78.6	84.2	+5.8
Science	5.9	64.7	75.0	+10.3
Total	25.0	71.2	81.3	+10.1
Total (N)	**56**	**59**	**75**	

* p≤0.05

As illustrated in Table 3.16, the proportion of male tutors in Year 1 and Year 2, demonstrating student-focused remained unchanged between 2018 and 2019.

TABLE 3.16: Tutors demonstrating the use of student-focused teaching methods by sex and level (%)

Level	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Year 1	16.8	81.3	80.4	-0.9
Year 2	17.3	75.7	74.2	-1.5
Total	26.4	78.4	77.1	-1.3
Total (N)	**220**	**222**	**293**	

Level	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Year 1	12.1	77.8	82.5	+4.7
Year 2	13.3	65.6	80.0	+14.4
Total	25.0	71.2	81.3	+10.1
Total (N)	**56**	**59**	**75**	

* p≤0.05

3.4.2 Demonstration of Gender-Sensitive Instructional Methods by Tutors

Output Indicator 4.4 Percentage of male and female tutors using gender-sensitive instructional methods

Annual survey 2019 target for

- **English male tutors is 75 percent and female tutors is 65 percent**
- **Mathematics male tutors is 85 percent and female tutors is 75 percent**
- **Science male tutors is 75 percent and female tutors is 80 percent**

The annual survey assessed tutors' use of gender-responsive instructional methods based on the following criteria:

- The extent of equal treatment of female and male students (with regard to questions, discussion, participation, encouragement, classroom leadership, etc.)
- The usage of gender-responsive strategies (with regard to challenging traditional gender roles in TLMs, examples, activities, etc.)

To assess the current level of tutors' use of gender-sensitive instructional methods, three methods were employed to provide composite scores: lesson observations, follow-up interviews with tutors; and self-administered questionnaires for six students of the observed tutors using scoring rubrics based on a composite score from the three assessment tools (see Annex 2.2). The scoring rubric deployed in the analysis is the **_ideal_ score**, which is the score recognised to be the level required to demonstrate gender-sensitive instructional methods. The minimum composite score for a tutor to be counted towards the log frame indicator is 16 points for tutor observation, 7 points for tutor interview, and 24 points for students of the tutor interviewed.

Based on the measurement of the indicator, Table 3.17 shows a statistically significant increase in the proportion of both male and female tutors who use gender-sensitive instructional methods. Across subjects, male English

and science tutors obtained significantly higher scores. The proportion of female tutors demonstrating gender-sensitivity significantly increased between 2018 and 2019. Female English tutors had the highest significant increase by 29.0 percentage points. The annual survey 2019 target has been achieved by male English and science tutors. Female EMS tutors achieved the 2019 target.

TABLE 3.17: Tutors demonstrating gender-sensitive instructional methods by sex and subject (%)

Subjects	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	4.7	65.1	81.2	+16.1*
Mathematics	2.6	75.0	76.4	+1.4
Science	0.0	65.8	76.5	+10.7*
Total	1.8	68.9	77.8	+8.9*
Total (N)	**220**	**222**	**293**	
Subjects	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
English	0.0	57.1	86.1	+29.0*
Mathematics	11.1	64.3	84.2	+19.9*
Science	5.9	76.5	85.0	+8.5
Total	3.6	64.4	85.3	+20.9*
Total (N)	**56**	**59**	**75**	

* p≤0.05

As shown in Table 3.18, the proportion of male tutors in Year 2 demonstrating gender-sensitive instructional methods increased significantly. Also, the proportion of both female tutors in Year 1 and Year 2 demonstrating gender-sensitivity increased significantly from 2018 to 2019.

TABLE 3.18: Tutors demonstrating the use of gender-sensitive instructional methods by sex and level (%)

Level	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Year 1	2.7	72.0	74.6	+2.6
Year 2	0.0	66.1	80.7	+14.6*
Total	1.8	68.9	77.8	+8.9*
Total (N)	**220**	**222**	**293**	
Level	Annual survey (Oct-2015)	Annual survey (Jun- 2018)	Annual survey (Jun-2019)	Δ from 2018 to 2019
Year 1	0.0	63.0	87.5	+24.5*
Year 2	13.0	65.6	82.9	+17.3*
Total	3.6	64.4	85.3	+20.9*
Total (N)	**56**	**59**	**75**	

* p≤0.05

3.4.3 Demonstration of Application of the National Teachers' Standards

> **Output Indicator 4.2C Percentage of tutors demonstrating an understanding and application of the NTS (Target for tutors is 80 percent in 2019)**

T-TEL output indicator 4.2 measures the percentage of tutors who understand and apply the NTS to guide teacher preparation and practice in their schools. In this regard, the annual survey assessed the demonstration of NTS through observation and interview.

As illustrated in Table 3.19, 60.1 percent of sampled tutors were observed as applying the NTS expected of college tutors. The results further reveal that 61.3 percent of female tutors demonstrated the application of key components of NTS. The 2019 target of 80 percent for this indicator has not been achieved.

TABLE 3.19: Tutors demonstrating the application of NTS by sex and subject (%)

Subjects	Male	Female	Overall
English	57.7	72.2	62.0
Mathematics	59.4	52.6	58.4
Science	61.8	50.0	59.8
Total	59.7	61.3	60.1
Total (N)	**293**	**75**	**368**

Table 3.20 provides scores of NTS-related classroom observations used in the computation of the indicator. We observe from the results that the key drivers for the indicator are 'tutor creates a safe, encouraging learning environment', 'Tutor listens to students and give constructive feedback', and 'Tutor employs a variety to strategies to encourage participation and critical thinking'. We also observe from the results that tutors scored least on the 'use of strategies to enactment in the lesson' (12.8 percent) and also 'teaching students how children develop and learn in diverse contexts'. An improvement in these competencies will increase the proportion of tutors who satisfy the indicator.

TABLE 3.20: Observation scores for tutors demonstrating NTS by sex (%)

Teacher Competencies	Male	Female	Overall
Creates a safe, encouraging learning environment	97.6	97.3	97.6
Tutor listens to students and gives constructive feedback	93.5	96.0	94.0
Employs a variety of instructional strategies that encourage student participation and critical thinking	90.4	89.3	90.2
Teacher exhibits ethical teacher codes of conduct during the lesson delivery	78.8	78.7	78.8
Pays attention to all students, especially girls and students with Special educational needs, ensuring their progress	42.3	56.0	45.1
Explains concepts clearly using examples familiar to students	41.6	42.7	41.9
Uses a variety of assessment modes during teaching to support learning	38.2	50.7	40.8
Teacher demonstrates effective, growing leadership qualities in the classroom	28.3	41.3	31.0
Produces and uses a variety of teaching and learning resources that enhance learning, including information, communication, and technology	30.0	32.0	30.4
Teacher use of age and grade(s) appropriate strategies to enact in the lesson	13.7	9.3	12.8
Understands how children develop and learn in diverse contexts and applies this in their teaching	13.3	10.7	12.8

With regards to the year group tutors teach, an even proportion of tutors teaching in Year 1 (59.0 percent) and Year 2 (61.1 percent) demonstrate the application of NTS. The results also show that 59.4 percent of male tutors teaching Year 1 class demonstrate the application of NTS, while 57.5 percent of the female counterparts demonstrate application of NTS. For tutors teaching Year 2 classes, 60 percent of male tutors demonstrated the application of NTS with 66 percent of female tutors also did so.

3.5 CoE Students' Output Indicator Findings

3.5.1 Demonstration of Higher Levels of Expected Graduate Attributes identified in the Curriculum Writing Guide

> **Outcome Indicator 1.4 Percentage of student teachers that demonstrate higher levels of expected graduate attributes identified in the curriculum writing guide**
>
> **(2019 target yet to be set)**

The indicator measures the proportion of student teachers that demonstrate expected graduate attributes identified in the curriculum writing guide as defined in Box 3.6.

Results in Table 3.21 show that 39.2 percent of student teachers demonstrate the expected graduate attributes in the curriculum writing guide. A proportion of 41.5 percent of male student teachers demonstrate higher levels of expected graduate attributes included in the curriculum writing guide, while 36.9 percent of female student

Box 3.6: Graduate attributes domains
- Enthusiastic, good teachers with the professional skills, knowledge, and understanding that enable them to achieve the NTS.
- Independent learners with academic skills such as clarity of expression (written and spoken) and the ability to support their arguments with effective use of reading.
- Innovative practitioners who understand the curriculum and are able motivate those they teach.
- Reflective practitioners who develop their teaching through planning for learning, recognizing and addressing issues related to inclusion and equity, using classroom and school-based action research and enquiry, integrating technology, core and transferable skills into their teaching, responding effectively to challenges including education policy and curriculum change demonstrating initiative and resilience.
- Teachers who demonstrate: thorough understanding of equity and inclusivity in education, responding appropriately to the needs of all pupils; the ability to build a strong network of relationships with their pupils, other professionals and parents and caregivers; the manipulative skills necessary to teach practical subjects ; the ability to support and manage the learning and well-being of all pupils whatever the context of the school and its community; effective, growing leadership qualities in the classroom and in the wider school community, guided by the legal and ethical codes of conduct required by a professional teacher.

teachers also do same. An almost even proportion of student teachers in Year 1 (38.0 percent) and Year 2 (40.4 percent) demonstrate higher levels of expected graduate attributes in the curriculum writing guide. Similar results were recorded across sex. (See Annex 3.3 for the student competency scores for the indicators)

TABLE 3.21: Student teachers demonstrating higher levels of expected graduate attributes in the curriculum writing guide by sex and year (%)

Sex	Year 1 students	Year 2 students	Total
Male	41.4	41.6	41.5
Female	34.7	39.1	36.9
Total	38.0	40.4	39.2
Total (N)	**1,088**	**1120**	**2,208**

One of the key competencies of this indicator where students scored least (15.6 percent) is 'being articulate and persuasive in their expressions' and also 'effectively supporting their arguments with reading.' An improvement in this competency will increase the proportion of students satisfying the requirements of this indicator.

3.5.2 Demonstration of Application of the National Teachers' Standards

Output Indicator 4.2b Percentage of student teachers demonstrating an understanding and application of the NTS

(Target for student teachers is 70 percent in 2019)

The NTS represents the first collectively agreed standards to guide teacher preparation and practice in Ghana. The standards represent 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 behaviours they are supposed to exhibit. The Standards set a clear baseline of expectations for the professional knowledge, practice, conduct, attitude, rights, and obligations expected of teachers working in schools at the pretertiary level. All teachers completing their initial teacher training will be assessed against the NTS. The standards are divided

Box 3.7: 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

into three main domains, each with its own subdivisions (See Box 3.7)

Table 3.22 show results of CoE students demonstrating the application of the NTS. The results indicate that 31.9 percent of CoE students demonstrating application of NTS, with males constituting 35.0 percent and females constituting 28.9 percent. Across year groups, a significantly higher proportion of male student teachers in Year 1 demonstrated application of NTS than their female peers. Also, significantly more female students in Year 2 demonstrated knowledge in NTS compared to their counterparts in Year 1. The target of 70 percent set for this indicator for 2019 has not been achieved.

TABLE 3.22: CoE students demonstrating the application of NTS by sex and year (%)

Sex	Year 1 students	Year 2 students	Total
Male	34.0††	35.8	35.0
Female	26.0	31.9‡	28.9
Total	29.9	33.9	31.9
Total (N)	**1,088**	**1,120**	**2,208**

‡, †† p≤0.05

Evaluating the various competency scores that determine the proportion of students meeting the requirement of the indicator, students scored least on three key areas of the NTS, these are; 'How a teacher should portray himself/herself as a role model to students', 'How a teacher should engage with his/her students' parents and the community' and 'How a teacher should take into consideration learners' backgrounds in his/her planning and teaching'. An improvement in these competencies will increase the proportion of students satisfying the requirements of the indicator.

Output Indicator 5.3a Percentage of mentors that reinforce key components of the National Teachers' Standards

(2019 target yet to be set)

The annual survey assessed whether mentors are reinforcing NTS to guide teacher preparation and practice in their schools. As illustrated in Table 3.23, 29.7 percent of mentors were reinforcing key components of NTS expected of teachers. The results further reveal that significantly more male mentors than female mentors reinforce key components of NTS.

TABLE 3.23: Mentors demonstrating the application of NTS by sex and subject (%)

Sex	English	Mathematics	Science	Total
Male	38.6	29.4	38.8††	34.9††
Female	27.7	24.3	18.0	24.1
Total	31.7	27.9	28.9	29.7
Total (N)	**158**	**122**	**128**	**408**

†† p≤0.05

Based on the level taught by mentors, the results reveal that 32.0 percent of mentors in JHS demonstrate the application of NTS. The results also indicate that a higher proportion of male mentors in lower primary demonstrate application of NTS than female mentors at the lower primary level of education (see Table 3.24).

TABLE 3.24: Mentors demonstrating the application of NTS by sex and level (%)

Sex	Lower Primary	Upper Primary	JHS	Total
Male	44.4††	33.3	34.6	34.9††
Female	21.8	25.4	26.5	24.1
Total	25.7	30.0	32.0	29.7
Total (N)	**105**	**150**	**153**	**408**

†† p≤0.05

Output Indicator 5.4 Percentage of mentees receiving support from mentors in the delivery of basic education curriculum using pedagogy in line with the National Teachers' Standards and reflective of gender- and student-responsive instruction

(2019 target yet to be set)

T-TEL output indicator 5.4 measures the demonstration of NTS by mentees with the support of mentors in the delivery of basic education curriculum reflecting both gender- and student-responsive instructions. To measure this indicator, the 2019 survey assessed whether mentees demonstrate the application of NTS in their preparation and practice through the support of their mentors. As illustrated in Table 3.25, 23.0 percent of mentees were observed to be demonstrating knowledge and application of NTS. The results further reveal that 26.1 percent of

male mentees demonstrate application of NTS, with 19.0 percent being female mentees exhibiting strong application of key components of NTS.

TABLE 3.25: Mentees demonstrating knowledge and application of NTS by sex and subject (%)

Sex	English	Mathematics	Science	Total
Male	27.7	27.6	23.6	26.1
Female	18.8	21.2	17.0	19.0
Total	22.4	25.3	21.1	23.0
Total (N)	**116**	**150**	**142**	**408**

With respect to the level, mentees were assessed, the results further show that slightly more than a quarter of mentees at the JHS level were observed to be applying NTS, with 34.6 percent being males and 8.9 percent being females. About one-quarter of mentees at the lower primary level show high levels of application of key components of NTS, with 27.0 percent males and 23.0 females. At the upper primary level, 18.6 percent of mentees showed high levels of application of key components of NTS, with 16.1 percent males and 22.1 percent females (See Table 3.26).

TABLE 3.26: Mentees demonstrating the application of NTS by sex and level (%)

Sex	Lower Primary	Upper Primary	JHS	Total
Male	27.0	16.1	34.6	26.1
Female	23.0	22.1	8.9	19.0
Total	24.5	18.6	26.9	23.0
Total (N)	**98**	**161**	**149**	**408**

3.8 CoE Principal Output Indicator Findings

3.8.1 Demonstration of Application of Inclusive and Gender-Sensitive Environment

> **Output Indicator 1.3 Percentage of colleges that ensure an inclusive, gender-sensitive environment for all staff and student teachers.**
>
> **(2019 target yet to be set)**

The indicator is measured by calculating the percentage of CoEs that meet or exceed 15 points on a composite scale based on three instruments: (a) the CoE Principal Interview Guide; (b) the Tutor Lesson Observation Tool; and, (c) the CoE Student Questionnaire. See Box 3.9 for criteria for measuring the indicator. The results indicate that less than one-fifth (17.4 percent) of colleges ensure an inclusive, gender-sensitive environment. Across sex of college principals, a higher proportion of male principals (21.9 percent) ensure an inclusive, gender-sensitive environment than female principals (7.1 percent).

Box 3.9 Criteria for measurement

❖ **CoE Principal Interview Guide:**
- College provides evidence that it provides dedicated spaces and admission for students from disadvantaged backgrounds
- College provides evidence that it has a transparent reporting system for harassment
- College provides evidence that it provides recourse and reprimand for harassment of any kind

❖ **Tutor Lesson Observation Tool:**
- The tutor uses gender-responsive strategies to challenge gender roles and gender norms.

Output Indicator 5.1 Percentage of partner schools meeting minimum quality criteria

(2019 target yet to be set)

The 2019 survey examined the minimum quality criteria met by partner schools. The quality indicator includes *Teaching & Learning, Monitoring & Evaluation,* and *Pastoral Support*[11]. In computing this indicator, partner schools must obtain a rating of 'Good' or 'Excellent' on a four-point Likert scale to satisfy the indicator. As shown in Table 3.27, exactly half of all partner schools have met the minimum criteria with significantly more female-headed schools meeting the criteria compared with male-headed partner schools.

TABLE 3.27: Partner schools meeting minimum criteria (%)

Partner schools	Scores
Male-headed schools	44.7††
Female-headed schools	60.3
Overall	50.0
Total (N)	**214**

†† p≤0.05

Table 3.28 provides a breakdown of the performance of the partner schools based on the criteria for the indicator. Overall, about 68 percent of partner schools met the teaching and learning criteria while about half of the partner schools (51.9 percent) met the pastoral support criterion.

TABLE 3.28: Competency scores for partner schools meeting minimum criteria (%)

Competency	Male-headed	Female-headed	Overall
Teaching & Learning	66.7	71.2	68.2
Monitoring & Evaluation	51.8	57.5	53.7
Pastoral Support	45.4††	64.4	51.9
Total (N)	**141**	**73**	**214**

Output Indicator 5.2 Percentage of CoEs' partner schools that are inclusive and gender-sensitive

(2019 target yet to be set)

Partner schools that are inclusive ensure access and learning for all children, especially those disadvantaged because of linguistic, ethnic, gender, geographic considerations, religious minorities, those from economically impoverished backgrounds, and children with special educational needs, including those with disabilities.

Results from Table 3.29 reveals that 32.7 percent of partner schools are inclusive and gender-sensitive. Female head teachers obtained higher scores compared with the male head teachers.

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[11] Pastoral Support is a service that provides help and support to students as well as providing information, advice and guidance.

TABLE 3.29 CoEs' partner schools that are inclusive and gender-sensitive (%)

Partner schools	Scores
Male-headed schools	29.8††
Female-headed schools	38.4
Overall	32.7
Total (N)	**214**

Table 3.30 reveals that partner schools scored least on the accessibility of children to the schools with 4.2 percent of partner schools demonstrating competence in providing special education needs.

TABLE 3.30 Scores on competencies obtained by partner schools for the indicator (%)

Partner schools	Scores
Accessibility of all children (including those with special educational needs) to the school's physical infrastructure designs and constructions.	4.2
TLMs are accessible to all learners, and they reflect and respect the diversity of Ghanaian society in their coverage	85.5
The school has a learning environment free from discrimination, is safe and friendly for all children within the school, and has sanctions in place for those who transgress this requirement	91.1
The school has an admissions policy that admits children from all backgrounds	82.7
Total (N)	**214**

> **Output Indicator 5.3B Percentage of head teachers in partner schools that reinforce key components of the National Teachers' Standards**
>
> **(2019 target yet to be set)**

The 2019 survey also assessed whether head teachers of CoE partner schools are enforcing NTS to guide teacher preparation and practice in their schools. About 76.2 percent of head teachers in partner schools were identified as reinforcing key components of NTS. The results further reveal that 78.7 percent of male-headed teachers reinforce components of NTS in partner schools while 71.2 percent of female head teachers were found to be reinforcing key components of NTS in their schools.

The annual survey sought to measure the progress made by T-TEL towards the achievement of results in its log frame. The survey was intended to provide information on what has or has not changed as a result of T-TEL's ongoing efforts. In sum, the annual survey produced robust evidence that can inform policy and practice aimed at driving improvements in CoEs and partner schools. The key conclusions are outlined below:

The results of the study portray a further improvement in T-TEL's quest to improve teacher education in Ghana. This is evident based on the significant progress in achieving targets set especially for the outcome indicators. After exploring the results of the outcome indicators, we can conclude that significantly more females have improved compared with previous annual surveys. Progress in PTTPDMF as well as knowledge and application of school curriculum, was significantly driven by teachers' interactive engagement with students and teachers' use of various strategies to provide explanations to the challenges of students face. However, the study reveals that some teachers are not adhering to issues related to gender-sensitivity. Beginning teachers must ensure that girls and boys and also vocal and quiet pupils are equally mixed throughout the classroom. Also, teachers have to ensure that children who need more support or have some form of disability are sitting at the front seats in the classroom.

For tutors, the key output indicators have not witnessed a decline from previous surveys. However, the rate of increment in the proportion of tutors demonstrating student-focused teaching and gender-sensitive instructional methods has stagnated with no notable significant increments in the 2019 annual survey.

ANNEXES

ANNEX 1: LIST OF COLLEGES OF EDUCATION

Zones	NAME of CoE	DISTRICT & REGION	SEX COMPOSITION of CoE M = Mixed-sex CoE SF = Female-only CoE SM = Male-only CoE	POPULATION
ZONE 1 NORTHERN / UPPER EAST & WEST	1. Bagabaga College of Education**	Tamale Metropolitan District / Northern Region	M	970
	2. Bimbila Evangelical Presbyterian College of Education**	Nanumba North District / Northern Region	M	1,088
	3. Gbewaa College of Education	Bawku District / Upper East Region	M	1,124
	4. Nusrat Jahan Ahmadiyya College of Education**	Wa Municipal District / Upper West Region	M	769
	5. St John Bosco College**	Navrongo, (Kassena-Nankana District) / Upper East Region	M	1,155
	6. Tamale College of Education	Tamale Metropolitan District / Northern Region	M	1,185
	7. Tumu College of Education**	Tumu (Sissala East District) / Upper West	M	715
	8. Gambaga College of Education	Gambaga District/ Northern region	M	878
	9. St. Vincent College of Education	Yendi, Northern Region	M	247
	10. McCoy College of Education**	Nadowli, U/W	M	234
ZONE 2 ASHANTI / BRONG AHAFO	1. Akrokerri College of Education**	Adansi North District / Ashanti Region	M	1,201
	2. Atebubu College of Education	Atebubu-Amantin District / Brong Ahafo Region	M	1,140
	3. Agogo Presbyterian College of Education**	Asante Akim North District / Ashanti Region	SF	732
	4. Berekum College of Education**	Berekum Municipal District / Brong Ahafo Region	M	1,247
	5. Mampong Technical College of Education**	Mampong Municipal District / Ashanti Region	SM	1,194
	6. Ofinso College of Education	Offinso Municipal District / Ashanti Region	M	1,103
	7. St. Joseph College of Education**	Bechem, (Tano South District) / Brong Ahafo Region	M	869
	8. St. Louis College of Education	Kumasi Metropolitan / Ashanti Region	SF	1,017
	9. St. Monica's College of Education**	Mampong Municipal District / Ashanti Region	SF	1,078
	10. St. Ambrose College of Education**	Dormaa Municipal /Brong Ahafo Region	M	435
	11 Wesley College of Education**	Kumasi Metropolitan / Ashanti Region	M	1,026
	12.Al Faruq College of Education	Wench, Brong Ahafo	M	422

Zones	NAME of CoE	DISTRICT & REGION	SEX COMPOSITION of CoE M = Mixed-sex CoE SF = Female-only CoE SM = Male-only CoE	POPULATION
	13.Seventh Day Adventist College of Education, Agona**	Agona, Ashanti Region	M	690
ZONE 3 VOLTA	1. Akatsi College of Education**	Akatsi South District / Volta Region	M	1,126
	2. Dambai College of Education**	Krachi East District / Volta Region	M	702
	3. Evangelical Presbyterian College of Education	Amedzofe, (Ho Municipal) / Volta Region	M	599
	4. Jasikan College of Education**	Jasikan District / Volta Region	M	1046
	5. Peki College of Education**	Peki, (South Dayi District) / Volta Region	M	631
	6. St. Francis' College of Education**	Hohoe Municipal District / Volta Region	M	1,013
	7. St. Teresa's College of Education**	Hohoe Municipal District / Volta Region	SF	630
ZONE 4 CENTRAL & WESTERN	1. Enchi College of Education**	Aowin District / Western Region	M	841
	2. Foso College of Education**	Assin North District / Central Region	M	1,008
	3. Holy Child College of Education	Takoradi Metropolitan / Western Region	SF	734
	4. Komenda College of Education**	Komenda-Edina-Eguafo-Abrem District / Central Region	M	970
	5. Ola College of Education**	Cape Coast Metropolitan / Central Region	SF	1,057
	6. Wiawso College of Education**	Sefwi-Wiawso District / Western Region	M	1,077
	7. Bia Lamp Lighter College of Education	Sefwi Essam Debiso	M	274
ZONE 5 EASTERN / GREATER ACCRA	1. Abetifi Presbyterian College of Education**	Kwahu East District / Eastern Region	M	1009
	2. Ada College of Education	Dangme East District / Greater Accra Region	M	838
	3. Accra College of Education	Accra Metropolitan / Greater Accra Region	M	911
	4. Kibi Presbyterian College of Education**	East Akim Municipal District / Eastern Region	M	776
	5. Mount Mary College of Education	Somanya, (Yilo Krobo District) / Eastern Region	M	1244
	6. Presbyterian College of Education**	Akropong, (Akuapim North District) / Eastern Region	M	1,439
	7. Presbyterian Women's College of Education	Aburi, (Akuapim South Municipal District) / Eastern Region)	SF	665
	8. Seventh Day Adventist College of Education**	Asokore-Koforidua, (New-Juaben Municipal District) / Eastern Region	M	1,076

Zones	NAME of CoE	DISTRICT & REGION	SEX COMPOSITION of CoE M = Mixed-sex CoE SF = Female-only CoE SM = Male-only CoE	POPULATION
	9. Methodist College of Education, Akim Asene-Aboabo, Oda**	Akim Asene-Aboabo, Oda Eastern Region	M	278

** Colleges in which classroom observations were conducted.

Annex 2.1 Beginning Teacher Rubrics

Scoring Rubrics for
Beginning Teacher.xls
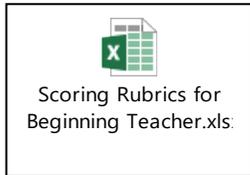
Annex 2.2 CoE Tutor Rubrics

Scoring rubrics for
Tutors.xlsx
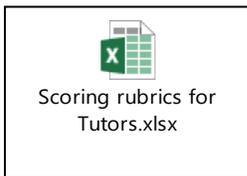
Annex 2.3 CoE Student Rubrics

Scoring Rubrics for
College Students.xlsx
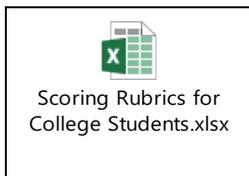
Annex 2.4 Mentor-Mentee Rubrics

Scoring rubrics for
Mentors and Mentees
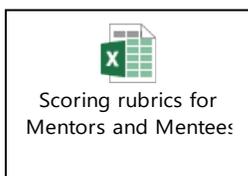
Annex 2.5 CoE Principal Rubrics

Scoring Rubric
College Principals.xlsx
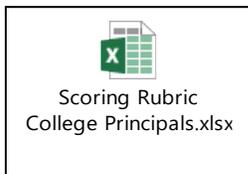
Annex 2.6 Partner School Rubrics

Scoring
Rubrics_Partner Schoc
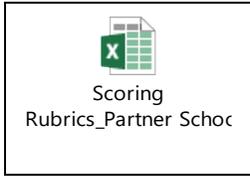
Annex 3.1 Beginning Teacher Competency Scores

Outcome Indicator 1.1 Percentage of male and female beginning English, science, and mathematics teachers demonstrating core competencies in the Pre-Tertiary Teacher Professional Development Management Policy Framework

Beginning teachers' observation competency scores from 2019 for outcome indicator 1.1 (%)

Teacher competencies	Male	Female	Overall
The teacher asks pupils/ students a range of questions during the lesson.	88.5	92.5	90.4
The teacher uses strategies to provide clear explanations for new concepts, knowledge, or skills.	88.1	86.4	87.3
The teacher gives constructive feedback on the student's answers, work or effort.	86.3	86.5	86.4
The teacher has a clear, high-quality lesson plan or activity plan for parts of the lesson.	80.4	86.7	83.5
The teacher uses strategies to open the lesson.	77.8	79.6	78.7
The teacher uses different teaching and learning materials to facilitate learning.	71.7	80.7	76.1
The teacher uses strategies to assess pupil/student understanding.	68.0	61.9	65.0
The teacher uses strategies to effectively manage a class (particularly a large class).	48.4	55.6	51.9
The teacher uses techniques to address mixed abilities.	45.8	46.3	46.0
The teacher has clearly paid attention to the seating arrangements in the classroom.	3.3	8.8	6.0

Outcome Indicator 1.2 Percentage of male and female beginning English, science, and mathematics teachers demonstrating knowledge and application of basic school curriculum and assessment

Beginning teachers' observation competency scores from 2019 for outcome indicator 1.2 (%)

Teacher competencies	Male	Female	Overall
The teacher uses strategies to provide clear explanations for new concepts, knowledge, or skills.	88.1	86.4	87.3
The teacher has a clear, high-quality lesson plan or activity plan for parts of the lesson.	80.4	86.7	83.5
The teacher uses strategies to close the lesson.	79.9	77.5	78.7
The teacher uses different TLMs to facilitate learning.	71.7	80.7	76.1
The teacher uses strategies to assess pupil/student understanding.	68.0	61.9	65.0
The teacher uses different interactive methods/ activities to facilitate learning.	51.7	59.8	55.7

Outcome Indicator 1.3 Percentage of beginning male and female English, science, and mathematics teachers demonstrating gender-responsive instructional strategies.

Beginning teachers' observation competency scores from 2019 for outcome indicator 1.3 (%)

Teacher competencies	Male	Female	Overall
The teacher applies all teaching methods equally to boys and girls.	82.6	81.1	81.9
The teacher uses strategies to challenge traditional gender roles and norms.	47.9	43.3	45.7
The teacher has clearly paid attention to the seating arrangements in the classroom.	3.3	8.8	6.0

Output Indicator 4.2A Percentage of beginning teachers demonstrating an understanding and application of the National Teachers' Standards

Beginning teachers' observation competency scores from 2019 for outcome indicator 4.2A (%)

Teacher Standards	Male	Female	Overall
Creates a safe, encouraging learning environment	96.4	97.0	96.7
Teacher listens to students and gives constructive feedback	88.2	88.7	88.4
Employs a variety of instructional strategies that encourage student participation and critical thinking	79.3	76.6	78.0
Teacher exhibits ethical teacher codes of conduct during the lesson delivery	72.1	77.4	74.7
Pays attention to all students, especially girls and students with special educational needs, ensuring their progress.	43.9	46.4	45.1
Explains concepts clearly using examples familiar to students	44.6	40.4	42.6
Uses a variety of assessment modes during teaching to support learning	36.4	40.4	38.4
Produces and uses a variety of teaching and learning resources that enhance learning, including information and communication technology	25.4	24.5	25.0
Teacher demonstrates effective, growing leadership qualities in the classroom	25.4	22.6	24.0
Understands how children develop and learn in diverse contexts and applies this in their teaching.	13.6	14.3	13.9
Teacher use of age and grade(s) appropriate strategies to enact in the lesson	11.8	15.9	13.8

Annex 3.2: Tutor Observation Competency Scores

Output Indicator 4.2C Percentage of college tutors demonstrating an understanding and application of the NTS

Tutor observation competency scores from 2019 for outcome indicator 4.2C (%)

Tutor Competencies	Male	Female	Overall
Creates a safe, encouraging learning environment	97.6	97.3	97.6
Teacher listens to students and gives constructive feedback	93.5	96.0	94.0
Employs a variety of instructional strategies that encourage student participation and critical thinking	90.4	89.3	90.2
Teacher exhibits ethical teacher codes of conduct during the lesson delivery	78.8	78.7	78.8
Pays attention to all students, especially girls and students with Special educational needs (SEN), ensuring their progress	42.3	56.0	45.1
Explains concepts clearly using examples familiar to students	41.6	42.7	41.9
Uses a variety of assessment modes during teaching to support learning	38.2	50.7	40.8
Teacher demonstrates effective, growing leadership qualities in the classroom	28.3	41.3	31.0
Produces and uses a variety of teaching and learning resources that enhance learning, including information, communication and Technology (ICT)	30.0	32.0	30.4
Teacher use of age and grade(s) appropriate strategies to enact in the lesson	13.7	9.3	12.8
Understands how children develop and learn in diverse contexts and applies this in their teaching	13.3	10.7	12.8

Output Indicator 4.3 Percentage of male and female English, science, and mathematics tutors demonstrating student-focused teaching methods

Tutor observation competency scores from 2019 for outcome indicator 4.3 (%)

Tutor Competencies	Male	Female	Overall
The tutor gives constructive feedback on the student's answers, work, or effort.	88.1	90.7	88.6
The tutor promotes and manages the whole-class discussion.	85.9	89.3	86.4
The tutor asks students a range of questions during the lesson.	84.6	92.0	86.1
The tutor applies all teaching methods equally to female and male students.	73.7	77.3	74.5
The tutor uses strategies to assess student understanding.	67.6	77.3	69.6
The tutor uses different interactive methods/ activities to facilitate learning.	61.1	66.7	62.2
The tutor uses strategies to organise and execute group or pair work.	60.4	66.8	61.7
The tutor uses techniques to address mixed abilities.	47.8	58.7	50.0
The tutor uses strategies to close the lesson.	34.5	42.7	36.1

Annex 3.3: Student Teacher Observation Competency Scores

Outcome Indicator 1.4 Percentage of student teachers' that demonstrate higher levels of expected graduate attributes identified in the curriculum writing guide

Student teachers' competency scores from 2019 for outcome indicator 1.4 (%)

Teacher Competencies	Year 1 students	Year 2 students	Overall
Innovative practitioners who understand the curriculum and are able to motivate those they teach	78.0	82.4	80.3
Teachers exhibit skills necessary to teach practical subjects	75.0	79.2	77.1
Teachers who demonstrate: the ability to support and manage the learning and well-being of all pupils whatever the context of the school and its community	72.0	73.3	72.6
Teachers who demonstrate a thorough understanding of equity and inclusivity in education, responding appropriately to the needs of all pupils	67.5	71.5	69.5
Teachers who demonstrate effective, growing leadership qualities in the classroom and in the wider school community, guided by the legal and ethical codes of conduct required by a professional teacher	60.8	65.3	63.0
Teachers who demonstrate: the ability to build a strong network of relationships with their pupils, other professionals and parents, and careers	30.1	38.0	34.1
Independent learners with academic skills such as clarity of expression (written and spoken) and the ability to support their arguments with effective use of reading	14.0	17.8	15.9

Output Indicator 4.2b Percentage of student teachers' demonstrating an understanding and application of the National Teachers' Standards

Student teachers' competency scores from 2019 for outcome indicator 4.2b (%)

Student Competencies	Year 1 students	Year 2 students	Overall
Clarity of expression of student	81.5	82.7	82.1
Qualities of a good teacher	78.4	77.4	77.9
What kinds of materials should the teacher use to enhance learning	75.0	79.2	77.1
How should a teacher give constructive feedback to students?	71.1	76.6	73.9
How should a teacher explain concepts using familiar examples to students	72.0	73.3	72.6
How should a teacher pay attention to all learners, especially girls and learners with special educational needs	67.5	71.5	69.5
What should a teacher do to portray himself/herself as an agent of change in the school, community or country as a whole	60.9	66.0	63.5
What are some of the codes of conduct	60.8	65.3	63.0
What should a teacher do to improve on his/her personal and professional development as a teacher	58.1	62.4	60.3
How should a teacher identify students who have learning difficulties and address their needs?	52.8	59.4	56.1

Student Competencies	Year 1 students	Year 2 students	Overall
What should the teacher do to conduct research to improve teaching?	49.9	54.8	52.4
What should a teacher do give tasks that encourage learner collaboration and leads to purposeful learning in a class	43.9	48.8	46.4
What strategies should a teacher use to deliver lessons to pupils at different age and ability groups	43.1	47.8	45.5
How should a teacher take into consideration learners' backgrounds in his/her planning and teaching?	33.8	38.8	36.3
How should a teacher portray himself/herself as a role model to students	31.5	36.9	34.2
How should a teacher engage with his/her students' parents and the community	30.1	38.0	34.1

Annex 3.4: Mentors' Competency Scores

Output Indicator 5.3a Percentage of mentors and head teachers in partner schools that reinforce key components of the National Teachers' Standards

Mentors' competency scores from 2019 for outcome indicator 5.3a (%)

Mentor Competencies	Male	Female	Overall
Creates a safe, encouraging learning Environment	98.6	97.5	98.0
Teacher listens to students and gives constructive feedback.	96.7	95.0	95.8
Employs a variety of instructional strategies that encourage student participation and critical thinking	95.2	90.5	92.9
The mentor exhibits ethical mentor Codes of conduct during the lesson delivery.	88.5	82.9	85.8
Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their Teaching.	84.2	75.4	79.9
Explains concepts clearly using examples familiar to students.	51.7	51.3	51.5
Manages behaviour and learning with small and large classes	46.4	46.7	46.6
Uses a variety of assessment modes during teaching to support learning	46.9	42.2	44.6
The mentor demonstrates effective, growing leadership qualities in the classroom	35.4	33.2	34.3
Pays attention to all students, especially girls and students with SEN, ensuring their progress.	35.4	26.1	30.9
The mentor understands how children develop and learn in diverse contexts and applies this in their teaching.	33.0	22.1	27.7
The mentor use of age and grade(s) appropriate strategies to enact in the lesson	24.9	27.6	26.2
Consideration of Learners' cultural, linguistic Socio-economic and educational backgrounds in planning and teaching	23.9	23.6	23.8
Produces and uses a variety of teaching and learning resources that enhance learning, including ICT.	23.9	22.6	23.3
Employs instructional strategies appropriate for mixed ability, Multi-lingual and multi-age classes	24.4	16.1	20.3
Sets meaningful tasks that encourage learner collaboration and leads to purposeful learning.	21.1	17.6	19.4

Mentors' competency scores from 2019 for outcome indicator 5.3a (%)

Teacher Competencies	Male	Female	Overall
Community practice	99.5	97.5	98.5
Teaching and learning	95.7	97.0	96.3
Assessment	87.1	84.9	86.0
Knowledge of educational framework	84.2	84.4	84.3
Knowledge of students	54.1	56.3	55.2
Managing the learning environment	46.9	44.7	45.8
Professional development	46.4	39.2	42.9

Annex 3.5: Mentees' Competency Scores

Output Indicator 5.4 Percentage of mentees receiving support from mentors in the delivery of basic education curriculum using pedagogy in line with the National Teachers' Standards and reflective of gender- and student-responsive instruction

Mentees' competency scores from 2019 for outcome indicator 5.4 (%)

Competencies	Male	Female	Overall
Creates a safe, encouraging learning environment	98.7	96.6	97.8
Teacher listens to students and gives constructive feedback.	42.9	93.7	95.6
Employs a variety of instructional strategies that encourage student participation and critical thinking	90.6	87.4	89.2
The mentee exhibits ethical mentor codes of conduct during the lesson delivery.	91.5	82.2	87.5
Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their teaching.	87.6	71.8	80.9
Explains concepts clearly using examples familiar to students.	58.6	51.7	55.6
Manages behaviour and learning with small and large classes	43.2	49.4	45.8
Uses a variety of assessment modes during teaching to support learning	43.2	42.5	42.9
The mentee demonstrates effective, growing leadership qualities in the classroom	30.8	29.3	30.2
Pays attention to all students, especially girls and students with Special educational needs (SEN), ensuring their progress.	29.1	29.3	29.2
Produces and uses a variety of teaching and learning resources that enhance learning, including ICT.	23.9	27.0	25.3
The mentee understands how children develop and learn in diverse contexts and applies this in their teaching.	24.4	17.8	21.6
Consideration of Learners' cultural, linguistic cocio-economic and educational backgrounds in planning and teaching	21.4	21.3	21.3
The mentee uses of age and grade(s) appropriate strategies to enact in the lesson	22.2	19.5	21.1
Employs instructional strategies appropriate for mixed ability, Multi-lingual and multi-age classes	23.5	13.8	19.4
Sets meaningful tasks that encourage learner collaboration and leads to purposeful learning.	20.5	12.1	16.9

Mentees' competency scores from 2019 for outcome indicator 5.4 (%)

Teacher Competencies	Male	Female	Overall
Community practice	99.2	99.4	99.3
Teaching and learning	99.2	97.1	98.3
Knowledge of educational frameworks	89.3	86.8	88.2
Assessment	86.8	85.1	86.0
Knowledge of students	52.1	48.9	50.7
Managing the learning environment	46.2	35.1	41.4
Professional development	42.3	32.8	38.2

A multiple regression is used when we want to predict the value of a variable (dependent) based on the values of two or more other variables (predictors). It is also used to determine if the predictors have any effect or significance in influencing the results of the dependent variable. In the context of this study, the outcome indicators for beginning teachers were used as dependent variables and the competencies that relate to the indicators were used as the predictors to determine the effect or influence they may have on the outcome indicators. The information below explains the key terminologies in the results of the analysis.

Parameter

Parameters are the distinct number of predictor variables (competencies) that were used in the model to predict the outcome.

Root Mean Square Error (RMSE)

The RMSE is the standard deviation of the prediction error. In other words, it provides information on the measure of the error in the prediction. Typically, the closer the RMSE is to zero, the better the prediction.

R-Squared

The R-squared (measured in percentages), also known as the coefficient of determination is a measure of how well the predictor variables (competencies) explain the variabilities in the outcome. Usually the larger the R-squared value, the better the regression model fits the observation.

F and P-Values

The F-test statistic and p-value is a method for testing the overall significance of the regression model. In summary, if the p-value is less than 0.05 (as it is in all the outputs for this study), it means the predictors are significant in predicting the outcome or dependent variable. Assuming we had observed a p-value of more than 0.05 for this study, it would mean the regression model is not useful.

Coefficients

Coefficients are changes that result in the outcome variable for unit changes in the predictor variables.

Standard Error

The standard error provides a measure of how wrong the regression model is on average using the units of the outcome variable. Smaller values are better because it indicates that the observations are closer to the fitted model.

t and P>|t|

This are results of a t-test which measures the significance of each of the competency items being measured. Usually, if the P>|t| value is less than 0.05, it means that the competency significantly contributes to the model. If the P>|t| value is greater than 0.05, it means the competency has no significant effect on the outcome.

Table 4.1: Output of multiple regression for beginning teacher outcome indicator 1.1

Parameters	RMSE	"R-Square"	F-Value	P-Value
28	0.2537186	0.7536	42.69686	0.0000

Competencies	Coefficient	Standard Error	t	P>|t|
Classroom observation				
Strategies to open lesson**	0.0027	0.0011	2.410	0.016
Strategies to give explanation	0.0017	0.0038	0.450	0.651
Use of different teaching materials	0.0061	0.0036	1.710	0.088
Ask range of questions**	0.0051	0.0014	3.670	0.000
Use of assessment strategies**	0.0039	0.0007	5.220	0.000
Gives constructive feedback	0.0013	0.0013	1.020	0.310
Strategies for mixed abilities**	0.0178	0.0053	3.360	0.001
strategies to manage a class	0.0073	0.0041	1.780	0.075
Attention to seating arrangements	-0.0046	0.0075	-0.610	0.540
High quality lesson plan	0.0013	0.0034	0.400	0.691
Teacher interviews				
Strategies to open lesson	0.0166	0.0092	1.79	0.074
Strategies to give explanation	0.0100	0.0073	1.37	0.171
Use of different teaching materials	0.0120	0.0072	1.66	0.097
Questions that prompt analysis**	0.0231	0.0084	2.76	0.006
Use of assessment strategies**	-0.0232	0.0097	-2.38	0.018
Gives constructive feedback**	0.0214	0.0087	2.46	0.014
Strategies for mixed abilities	-0.0059	0.0121	-0.49	0.627
strategies to manage a class	-0.0089	0.0121	-0.74	0.461
Attention to seating arrangements	0.0164	0.0125	1.31	0.191
High quality lesson plan**	0.0246	0.0071	3.47	0.001
Brings pictures, etc. to teach	-0.0038	0.0063	-0.61	0.542
Pupil sleeping game				
Make students feel bad	0.0021	0.0032	0.680	0.499
Tells students how to improve	0.0031	0.0031	1.000	0.317
Gives extra help to students	0.0036	0.0034	1.050	0.293
Makes sure the boys and girls are mixed**	0.0125	0.0036	3.480	0.001
Gets students to stop talking without shouting**	0.0075	0.0030	2.500	0.013
Makes the subject interesting and easy**	0.0096	0.0042	2.290	0.023
Constant term	0.4966	0.0540	9.200	0.000

NOTE: Competencies with (**) contributed significantly to the outcome indicator

Table 4.2: Output of multiple regression for beginning teacher outcome indicator 1.2

Parameters	RMSE	"R-Square"	F-Value	P-Value
14	0.2541736	0.74.17	88.7748	0.0000

Competencies	Coefficient	Standard Error	t	P>|t|
Classroom observation				
Strategies to open lesson	0.0026	0.0035	0.750	0.453
Strategies to give explanation	0.0025	0.0033	0.770	0.445
Use of different interactive methods**	0.0095	0.0029	3.250	0.001
Use of assessment strategies**	0.0101	0.0007	15.530	0.000
Use of strategies to close the lesson**	0.0111	0.0053	2.110	0.035
Strategies to open lesson	0.0026	0.0035	0.750	0.453
Strategies to give explanation	0.0025	0.0033	0.770	0.445
Teacher interviews				
Strategies to give explanation**	0.0233	0.0068	3.440	0.001
Use of different teaching materials	0.0050	0.0068	0.740	0.463
Use of different interactive methods**	0.0159	0.0070	2.260	0.025
Use of assessment strategies	-0.0014	0.0092	-0.160	0.875
Use of strategies to close the lesson	0.0161	0.0102	1.580	0.114
Pupil sleeping game				
Brings pictures or objects to help teach a lesson**	0.0192	0.0071	2.690	0.008
Uses activities like games or role play to help teach a lesson**	-0.0239	0.0080	-2.990	0.003
Goes over the important things he/she has taught**	0.0171	0.0033	5.170	0.000
Constant term	0.7077	0.0390	18.130	0.000

NOTE: Competencies with (**) contributed significantly to the outcome indicator

Table 4.3: Output of multiple regression for beginning teacher outcome indicator 1.3

Parameters	RMSE	"R-Square"	F-Value	P-Value
11	0.1767935	0.8564	288.5766	0.0000

Competencies	Coefficient	Standard Error	t	P>|t|
Classroom observation				
Equal treatment of girls and boys	-0.0015	0.0017	-0.850	0.395
Use of gender-responsive strategies**	0.0127	0.0003	37.900	0.000
Attention to seating arrangements	0.0032	0.0043	0.740	0.461
Teacher interviews				
Equal treatment of girls and boys**	0.0183	0.0039	4.630	0.000
Use of gender-responsive strategies**	0.0137	0.0067	2.060	0.040
Attention to seating arrangements	0.0111	0.0073	1.520	0.129
Pupil sleeping game				
Encourages girls to take leadership roles**	0.0049	0.0020	2.480	0.014
Likes boys and girls equally	0.0107	0.0229	0.470	0.642
Makes girls feel like they can do well in subject	0.0017	0.0019	0.920	0.360
Makes sure the boys and girls are mixed in the classroom seating arrangement	0.0045	0.0022	2.090	0.037
Constant term	0.9010	0.0224	40.280	0.000

NOTE: Competencies with (**) contributed significantly to the outcome indicator

Table 4.4: Output of multiple regression for beginning teacher outcome indicator 4.2A

Parameters	RMSE	"R-Square"	F-Value	P-Value
36	0.2123261	0.7999	58.1175	0.0000

Competencies	Coefficient	Standard Error	t	P>|t|
Classroom observation				
Demonstrates effective leadership**	0.0127	0.0039	3.270	0.001
Exhibits ethical teacher Codes of conduct	0.0037	0.0024	1.520	0.128
Uses appropriate strategies to enact during lesson**	0.0096	0.0040	2.370	0.018
Understands how children develop and learn in diverse contexts**	0.0124	0.0041	2.990	0.003
Creates a safe, encouraging learning Environment	0.0018	0.0036	0.490	0.624
Encourage student participation and critical thinking**	0.0057	0.0019	3.030	0.003
Pays attention to all students**	0.0131	0.0026	5.080	0.000
Explains concepts clearly using examples**	0.0092	0.0025	3.740	0.000
Uses a variety of teaching and learning resources	0.0032	0.0028	1.150	0.252
Uses a variety of assessment modes	-0.0057	0.0032	-1.740	0.082
Gives constructive feedback	-0.0040	0.0032	-1.260	0.206
Teacher interviews				
Critically reflect on practices to improve	0.0161	0.0157	1.030	0.306
Improve on personal professional development	-0.0002	0.0113	-0.020	0.983
Nurture effective leadership among students	0.0122	0.0132	0.920	0.358
Exhibit ethical codes of conduct in class	0.0034	0.0123	0.270	0.785
Engage with colleagues and other professionals	-0.0203	0.0168	-1.210	0.228
Engage with students' parents and community	-0.0050	0.0123	-0.400	0.688
Good role model for students	-0.0159	0.0152	-1.040	0.297
Agent of change in school and community	0.0057	0.0114	0.500	0.619
Command over subject area during lesson	0.0061	0.0149	0.410	0.683
Strategy to deliver lesson to all age groups	-0.0170	0.0174	-0.980	0.327
Plan lessons for all ability groups	0.0022	0.0149	0.150	0.883
Consideration of learner background	0.0319	0.0196	1.630	0.104
Small-scale action research for improvement**	0.0324	0.0098	3.320	0.001
Create a safe learning environment	-0.0085	0.0121	-0.700	0.484
Manage behaviour and learning with students**	0.0207	0.0100	2.070	0.039
Encourage participation and critical thinking	0.0234	0.0128	1.840	0.067
Pay attention to all students**	0.0195	0.0062	3.180	0.002
Appropriate strategy for mix learners' ability	-0.0071	0.0118	-0.600	0.547
Encourage learner collaboration	0.0003	0.0131	0.020	0.980
Explain concepts using familiar examples	-0.0172	0.0180	-0.960	0.339
Use variety of teaching and learning materials	-0.0119	0.0110	-1.080	0.280
Integrate a variety of assessment modes	0.0061	0.0095	0.640	0.522
Identify and rectify students' learning difficulties**	0.0638	0.0152	4.200	0.000
Communicate students' performance to parents	-0.0207	0.0107	-1.930	0.054
Constant term	-0.3672	0.0521	-7.040	0.000

NOTE: Competencies with (**) contributed significantly to the outcome indicator