

Impact Assessment of Teacher Professional Development Model

REPORT

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List of Acronyms

BACE	Bagabaga College of Education
BICE	Bimbilla College of Education
CPD	Continuous Professional Development
CoE	College of Education
DTST	District Teacher Support Team
E4L	Empowerment for Life
FGD	Focused Group Discussion
GES	Ghana Education Service
GV	Ghana Venskab
ICT	Information, Communication and Technology
INSET	In-service Teacher Education and Training
KII	Key Informant Interview
MoE	Ministry of Education (MoE)
MoU	Memorandum of Understanding
NaCCA	National Council for Curriculum and Assessment
NTC	National Teaching Council
NSAT	National Standards Assessment Test
NTS	National Teachers' Standards
PDC	Professional Development Coordinator
PTA	Parent-Teacher-Association
RAs	Research Assistant
ROI	Return on Investment
SfL	School for Life
SHEA	Sexual Harassment, Exploitation and Abuse
SISO	School Improvement Support Officer
SMART	Specific Measurable Realistic and Time-bound
SMC	School Management Committee
SPSS	Statistical Package for the Social Sciences
TACE	Tamale College of Education
TPD	Teacher Professional Development

EXECUTIVE SUMMARY

School for Life (SfL) and Danish NGO Ghana Venskab (GV) are two organizations that are committed to promoting inclusive quality basic education for all children in Ghana. To complement the government's efforts at ensuring good school-community relations, the creation of child friendly classrooms and good pupil-teacher relations, the two organizations since 2018 have been implementing the Teacher Professional Development (TPD) model in sixteen (16) schools in the Northern Region of Ghana. The TPD Model aims at contributing to the continuous professional development (CPD) of teachers to ensure improved learning outcomes in the schools. The introduction of the standard-based curriculum embedded in the National Pre-tertiary Education Curriculum Framework of Ghana has made this model even more important.

Therefore, having implemented the TPD Model for a number of years, SfL and partner GV commissioned an impact assessment to build the needed empirical evidence in order to advocate for the adoption by the ¹3 Colleges of Education and GES.

The impact assessment of the TPD Model was conducted in seven schools in the Mion, Karaga and Kumbungu districts. A mixed research approach was used in collecting and analysing data. A total of 384 participants including teachers, headteachers, District Teacher Support Teams, Professional Development Coordinators drawn from three colleges of education, school pupils, staff of SfL, PTA and SMC members participated in the impact assessment. The data collection tools included classroom observations, key informant interviews and focus group discussions. The findings from the impact assessment of the TPD Model showed that the model has contributed to improved learning environment in the schools. The findings showed improvement in teacher competencies. For instance 75% of teachers in Kumbungu were rated as having very good with regards to creating child friendly atmosphere in the classroom to support teaching and learning and another 75% in the same district rated as very good with regards to their pupil-teacher relations.. The impact assessment also confirmed significant positive changes in the academic performance of the pupils, with a social return on investment indicating positive gains from the implementation of the TPD Model. Key recommendations from the impact assessment included the following:

1. SfL and GV should explore ways of scaling up the TPD Model to many more schools. The roll-out of the TPD Model in districts and schools should commence with a baseline survey to ensure robust tracking of the achievements of the TPD Model. Negotiations could be

¹ The 3 colleges of Education are: Tamale College of Education, Bagabaga College of Education and Bimbilla College of Education

held with district stakeholders to identify treatment and control schools to ensure comparison in the changes in learning outcomes that can be attributable to the TPD Model.

2. SfL should advocate for the adoption and accreditation of TPD Model by NTC and NaCCA for CPD and INSET for teachers. This will motivate many more teachers to make themselves available for training at their own cost since their participation in the TPD Model trainings will help them accumulate the needed points for their promotions.
3. SfL could also explore the possibility of signing MoUs with some selected CoEs, and training some tutors in their colleges to roll-out the TPD Model as part of the training of teachers. This could serve as a basis for the adoption of the TPD model into the CoE curriculum if there is evidence to show a high pass rate of graduates in the teacher licensure examination.
4. The TPD Model should also target Kindergarten teachers. Early Childhood Educators need to understand child development and how to use learning through play (LTP) methodologies in teaching children at that tender age.
5. To be able to make a case for the nationwide adoption of TPD Model, SfL should partner with the district education offices to assess the social return on investment on government organised INSET to compare which of the two CPD models is more efficient.

1.0 INTRODUCTION

In 2019, the Ghana Education Service (GES) in collaboration with the NaCCA and the Ministry of Education (MoE) introduced a standard-based curriculum embedded in a National Pre-tertiary Education Curriculum Framework. This policy serves as the guideline against which the school curriculum will be reviewed and revised. The new educational reforms acknowledge that the success of Ghana's National Curriculum largely rests with the teacher factor. As observed by Knapp, (2003), higher standards for teachers accompany the push for higher standards for learners and greater accountability for student learning. Therefore, the National Curriculum made room for teacher CPD.

The key shifts in the reforms are highlighted below. First, is the expansion of Basic Education in Ghana which now comprise of kindergarten (4-5 years), Lower Primary (6-8 years), Upper Primary (8-12 years), Junior High School (12-15 years) and Senior High School (15-18 years). Second, is the change from "objective-based assessment" which was found to be too bookish with emphasis on merely passing examinations to "standard-based curriculum" which focuses on building character, nurturing values, and raising literate, confident, and engaged citizens who can think critically. The standard-based curriculum also ensures that the content of the national curriculum addresses national priorities and can be benchmarked internationally.

Third, the National Curriculum placed premium on learning with the following priorities:

- a particular focus on the **4Rs: Reading, wRiting, aRithmetic and cReativity** as a catalyst for achieving rapid sustainable developmental changes.
- a focus on the essential knowledge, skills and competences that Ghana's young people need to become educated citizens.
- a focus on mathematics and science as the fundamental building blocks for success in the era of technological advancement and
- ensuring that basic school lays the solid foundation necessary for tertiary education as well as preparations for early entry into the work place.

Fourth, the reforms emphasized the adoption of dialogic approaches to teaching which are more collaborative rather than the hitherto widely used teacher-centered approaches.

Fifth, CPD is also a critical factor in the new reforms for ensuring quality education. The importance of CPD cannot be over emphasized. No matter how good pre-service training for teachers is, it cannot be expected to prepare teachers for all the challenges they will face

throughout their careers. Education systems therefore seek to provide teachers with opportunities for in-service professional development in order to maintain a high standard of teaching and to retain a high-quality teacher workforce.

To improve the quality of the school experience and learning outcomes, Ghana passed the Education Act 778 (2008). This Act established a self-regulatory body for teaching known as the NTC, with responsibility for setting professional standards, registering and licensing teachers. The NTC ensures that National Teachers' Standards (NTS) which set out the minimum levels of practice that all trained teachers must reach by the end of their pre-service teacher education course in order to play such a critical role are adhered to.

1.1 Back ground to the study

The rapid technological changes in the world and differences in demographic and social conditions of learners warrant the continuous review of educational curricula. Therefore, the CPD of teachers is a *sine qua non* for meeting national and international aspirations. In the context of Ghana, the New National Curriculum requires the adoption of new pedagogical skills, acquisition of new knowledge and the use of ICT and other teaching and learning resources. Whilst some modest in-service trainings were rolled-out for teachers across the country, the effectiveness of these trainings vary from place to place. Additionally, teachers in some of the hard-to-reach districts with internet and electricity connectivity challenges have been unable to benefit from on-line teaching and learning resources.

It is within this context that SfL and GV made a commitment to support the CPD of teachers through the development and testing of the TPD Model. Since 2018, the two partners have tested the TPD Model in sixteen (16) schools and five (5) districts in the Northern Region of Ghana. The model aligns with the standard-based curriculum and seeks to improve relational competencies of teachers and to promote active learner participation and reflective teaching.

The implementation of the TPD Model involved the training of all teachers and headteachers in the beneficiary schools in various modules in the model, classroom observation and mentorship by District Teacher Support Teams (DTSTs) and Professional Development Coordinators (PDCs) from three Colleges of Education (CoE) namely, Tamale College of Education, Bagabaga College of Education in Tamale and Evangelical Presbyterian College of Education in Bimbilla. The roll-out of the TPD Model is meant to complement the In-Service Teacher Education and Training (INSET) programmes of the GES and NTC.

Preliminary feedback from teachers and other stakeholders in the beneficiary schools attest to improvement of teacher-learners' relations and more involvement of parents in school management.

The impact assessment of the TPD Model was therefore aimed at building empirical evidence on the value addition of the model in improving teaching and learning outcomes and to advocate for nation-wide adoption with the approval of the NTC.

1.2 Objectives

The objectives outlined for the impact assessment were as follows:

1. To ascertain the extent to which the TPD Model has impacted on the learning environment in the beneficiary schools.
2. To assess the impact of the TPD Model on learning outcomes in the beneficiary schools.
3. To examine the costs and benefits associated with the implementation of the TPD Model.

1.3 Questions Guiding the Study

The TPD Model impact assessment was guided by three main questions as indicated below:

1. Has the TPD Model contributed to improvement in the learning environment and outcomes in the beneficial schools?
2. Is there any statistically significant difference in pupils' mean scores before and after the implementation of the TPD model in P2 and P4 in the beneficiary schools?
3. What is the social returns on investment from the TPD Model?

2.0 METHODOLOGY

2.1 Impact Assessment Locations

The impact assessment was conducted in seven primary schools across three districts as shown in Table 1. These schools and districts historically have had challenges with access to quality public basic education. This informed the decision of SfL and GV to prioritize them for capacity building support under the Empowerment for Life (E4L) programme.

Table 1: TDP Model Impact Assessment Districts and Schools

Region	Districts	Schools
Northern	Mion	Kpligine Primary
		Sambu Primary
		Mbatinga Primary
	Karaga	Karaga Nurul Islam Prim. Sch
		Shebo D/A Prim. Sch.
	Kumbugu	Gingani R/C Primary School
		Nwogu Zion Primary School

2.2 Approach and Design

A mixed method approach was considered appropriate for this impact assessment given the need to collect and use both quantitative and qualitative data from the diverse participants involved in the TPD Model implementation. Also, a Pre-and Post TPD Model-test design was employed to examine the model's impact on learning outcomes. This was done for three subject areas, namely Mathematics, English Language and Science. The researchers also used Descriptive design which gave a leeward for the description of the various experiences of the TPD Model stakeholders.

The gains and improvements in learning were measured using the differences in mean scores of pupils between their post-TPD model administration scores and the baseline performance. In order to document the practices and strategies for possible national adoption of the model, the views of the various stakeholders involved in the implementation of the TPD Model were sought. The qualitative data collected from the participants was analysed thematically and the findings discussed, leading to major conclusions and recommendations for the action of the respective stakeholders.

2.3. Target Population for Impact Assessment

The TPD Model involved various stakeholders. These included pupils, teachers, head teachers, DTSTs, PDCs from CoE, SMCs, PTAs and SfL staff. All these categories of stakeholders were included in the impact assessment. The sample sizes selected for the various categories of stakeholders are shown in Table 2:

Table 2: Sample Size of Targeted Population

Stakeholders	Sample Size
1. Pupils	272 (Boys=36, Girls, 236)
2. Teachers	12
3. Headteachers	8
4. DTSTs	12
5. SMCs & PTAs	72
6. PDCs, CoE	2
7. SfL staff	6
Total	384

The sample size of 272 for pupils used in this study is the sum of the enrollments in P2 and P4 in the five basic schools involved in the study. There was no sampling done in favour of girls but the actual enrolments. The trend in Ghana is that, there are usually more girls at the primary school over boys but as they transition to the Junior High School, Senior High School the girls number declines significantly due to early marriages, teenage pregnancies, inability to purchase sanitary pads and other barriers which make them drop out of school. This explains why the school enrolment figures provided for the study had more girls over boys because the Primary 2 and 4 had more girls than boys.

2.4. Sample of Sampling Technique

The districts and schools involved in the impact assessment were purposively selected because they performed abysmally on the key variables of interest to the E4L project and were therefore beneficiaries of the SfL TPD Model testing. In each of the seven selected schools the headteachers were selected. In line with the framework for the conduct of National Standards Assessment Test (NSAT), Basic 2 and Basic 4 teachers were also selected for class room observation. This was to provide the evaluators the opportunity to assess the extent to which the teachers were adopting the pedagogical and other skills promoted in the TPD Model. The evaluators also collected the summative assessments scores of pupils in Basic 2 and Basic 4 for analysis to ascertain any changes in the test scores attributable to the TPD Model implementation.

2.5. Data Collection Methods and Tools

The impact assessment combined a number of data collection methods and tools. The methods employed included desk review of relevant project reports and literature, key Informant Interviews (KIIs) with heads of schools, DTSTs and PDCs. Focus Group Discussions (FGDs) with SMC and PTA members and class observation and rating of the performance of Basic 2 and Basic 4 teachers in the selected schools.

Five separate instruments (questionnaires and interview guides) as contained in Appendix 1 were developed and administered to the various categories of respondents which included pupils, teachers, Head teachers, District teachers support teams, PDC from CoE, GES training officers and school improvement support officers, PTAs and SMCs. The questionnaire for teachers focused on the mastery and demonstration of the key components in the TPD Model. The instrument for head teachers also covered how they ensured the implementation of the TPD model by the classroom teachers in their daily teaching in the selected schools. To measure pupils' gains and improved learning outcomes, Basic 2 and Basic 4 were selected for data collection. A tool was therefore developed and the class examination scores for mathematics (Numeracy), English language and science obtained for analysis.

2.6. Administration of Instruments

The Impact assessment instruments for gathering data were administered by trained research assistants under the guidance and supervision of the Monitoring, Evaluation and Research Officer and the Technical Advisor for Education and the lead consultant. This activity lasted for five days across the schools that participated in the assessment. Prior to the administration of the instruments, the research assistants were trained by the lead consultant on how to administer and conduct the individual interviews effectively. They were equally trained by the lead consultant on what to look out for in rating the performances of the teachers in the classroom. Examination scores template was also designed and given to the class teachers in Basic 2 and Basic 4 to populate. The scores were then analysed to determine whether a significant difference existed between their mean scores and the Effect size estimated to quantify the extent of gains. Effect size is the real measure of the impact. *A large effect size means that the TPD has practical significance, while a small effect size indicates limited practical applications.*

2.7 Methods of Data Analysis

The data was coded and analysed based on the research questions. The quantitative data was analysed by calculating the mean, standard deviation and effective size using SPSS, with results

presented as descriptive statistics, using tables and charts. In addition, all relevant responses were disaggregated based on variables such as district, school and category of respondents. The qualitative data was analysed under each specific research question and provided explanation where needed to complement the quantitative values. This is important because the quantitative data alone will not be sufficient for the planned advocacy for the nationwide adoption of the TPD Model.

2.8 Data Quality Assurance

Adequate measures were put in place to safeguard the integrity of the data and the final research report. The specific measures implemented are explained below. First, the SfL staff who served as the RAs, were trained on the data collection tools which were electronically administered. Second, the daily data entries were saved but only uploaded onto the server after the lead researcher had sampled some entries and certified that they met the quality criteria. Where there were gaps, the RAs were made to fill them before uploading. Third, the data was further cleaned before the analysis. Where inconsistencies were detected, RAs had to address those gaps before the final analysis. The above measures reduced data gaps and inconsistencies to the barest minimum.

2.9 Limitation of the Study

The terminal examination scores for the Shebo Primary School in the Karaga district and Mbatinga Primary in the Mion districts were not available. So instead of comparing the examinations scores of two schools in Karaga district only one was done and for Mion instead of three schools only two were available for analysis. This made it impossible to compare the learning gains across all the selected schools in the Karaga and the Mion districts.

3.0 RESULTS AND DISCUSSION

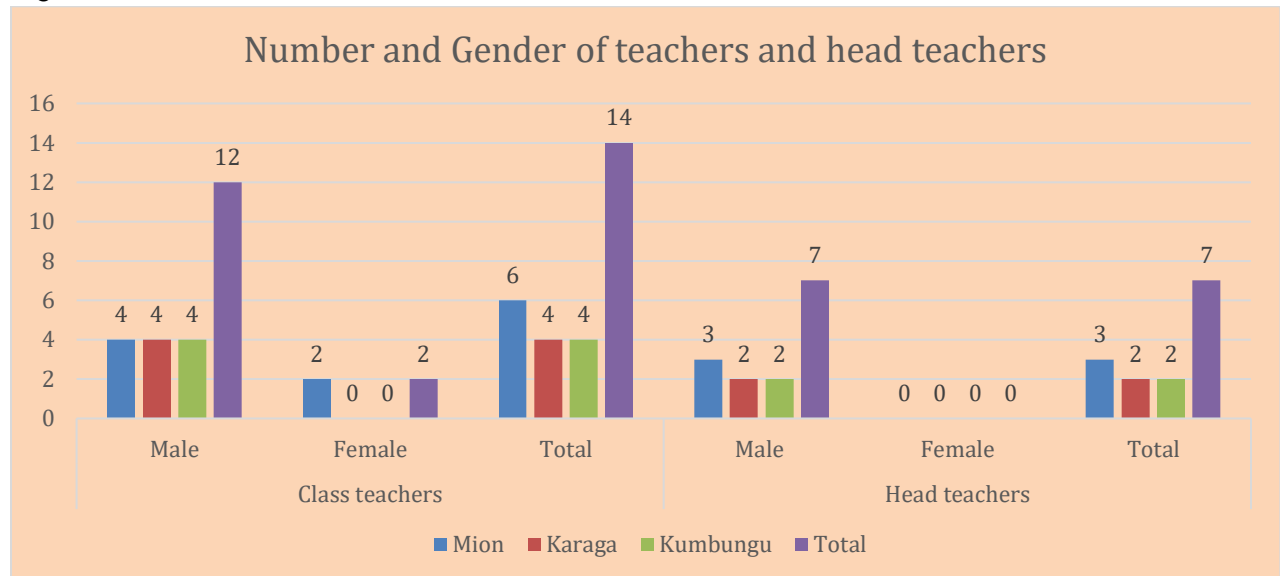
3.1 Demographics

3.1.1. Number and Gender of teachers

The findings as indicated in Figure 1, showed that a total of 14 class teachers participated in the impact assessment on the TPD model. Majority, 12 (85.7%) were males and 2 (14%) were females. The findings also showed that 7 head teachers participated in the study with all (100%) being males. It can therefore be concluded that there is no gender equity in the distribution of male and female teachers in the selected schools. Given the importance of female teachers as

role models to adolescent girls, this wide disparity between male and female teachers is a challenge.

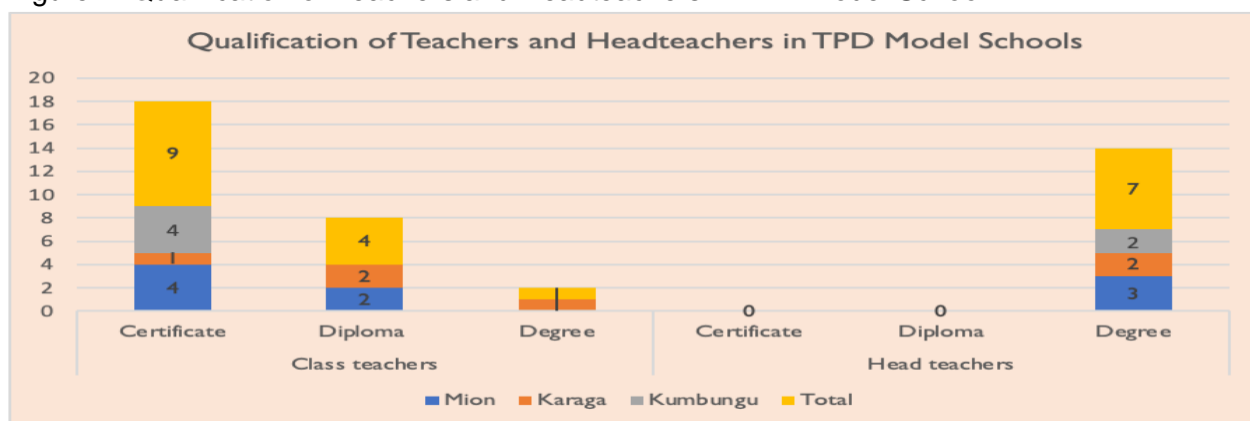
Figure 1: Number and Gender of Teachers and Headteachers in TPD Model Schools



3.1.2. Qualification of teachers

The minimum qualification for teaching in basic schools in Ghana is a certificate in basic education. However, the preferred qualification is a degree in basic education. The findings as indicated in Figure 2, showed that majority 9 (64%) out of 14 teachers held the minimum level of education, with 4(29%) and 1(7%) having Diploma and Degree certificates in basic education respectively. The few class room teachers holding Diploma and Degree qualifications makes a more compelling case for the roll-out of the TPD Model to increase their pedagogical skills to enable them function optimally in the class room. The findings however showed that all the 7(100%) head teachers had Degrees in Basic Education. However, one of the head teachers had a degree in BSc Real Estate, which is unrelated to teaching of children. This anomaly therefore needs to be rectified.

Figure 2: Qualification of Teachers and Headteachers in TPD Model School

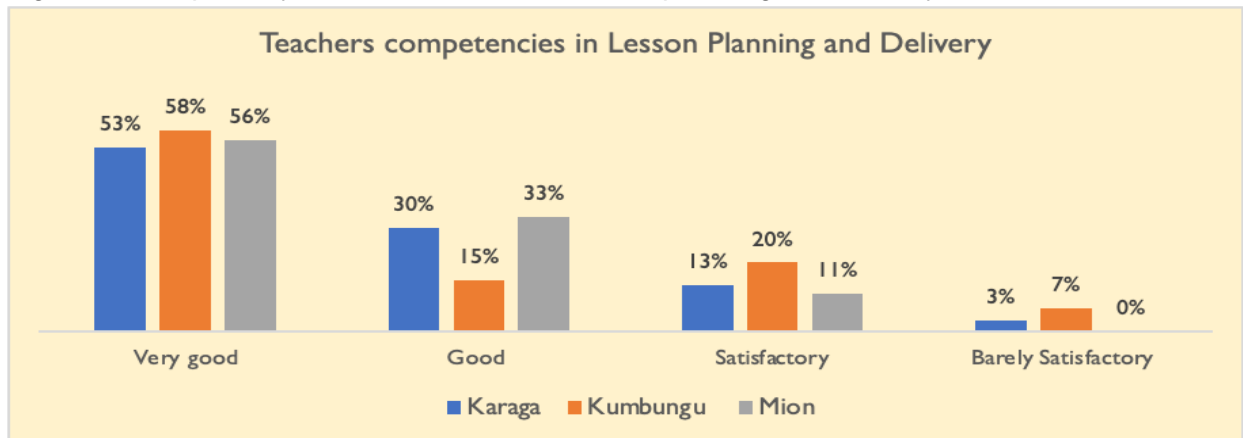


3.2 Impact of TPD Model on Learning Environment

The nature of the learning environment plays an active role in shaping the learning and behavioral outcomes of learners. It is in this respect that, the TPD Model has included modules to create a conducive environment for teaching and learning in the E4L programme schools. The TPD Model includes specific modules for improving the teaching skills and relations between teachers and pupils in the classroom situation and also with their parents and guardians. The impact assessment therefore assessed the competency levels of teachers who participated in the TPD Model trainings implemented by SfL. Classroom observations were conducted in Basic Two and Basic Four in each of the selected schools. This included observing and rating the performance of teachers in four domains with sub-variables. The domains were (1) Lesson planning and use (2) Teacher and Pupil Relations in the Classroom, (3) Child Friendly Atmosphere in the Classroom and (4) School and Community Relations.

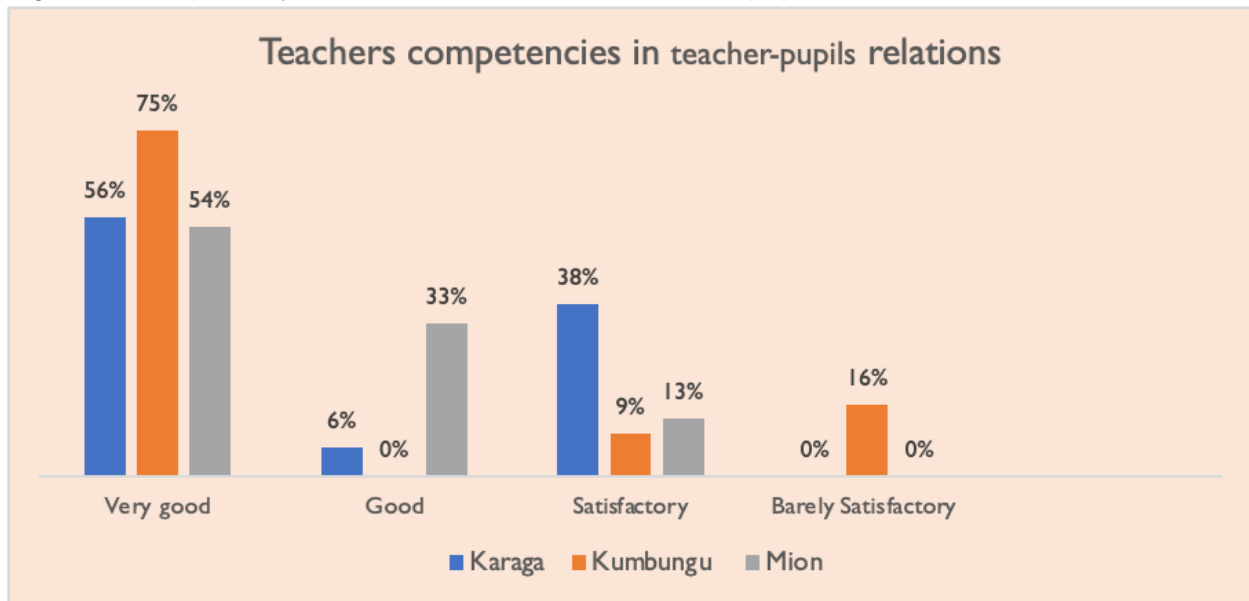
The findings on lesson planning and delivery, showed an increase in the competency levels of the teachers in all the districts as compared to the baseline. As shown in Figure 3, 53% of the teachers in Karaga, 58% in Kumbungu and 56% in Mion were rated around very good. The findings therefore portrayed that the teachers demonstrated very good competencies in lesson planning and delivery by preparing their schemes of learning, stating SMART objectives, exhibiting knowledge in the subject matter, reviewing the previous lesson, presenting the lesson in a systematic and orderly structure, presenting varied activities to the learners, using variety of teaching methods, with relevant examples, using teaching and learning resources appropriately, using questioning techniques appropriately by using probing and leading questions, providing extra directions to resource locations for learners to search for information to enhance their learning, pacing the lesson appropriately to ensure the learners follow, and drawing attention of learners to the end of the lesson by helping them to summarize and reinforce major points learned.

Figure 3: Competency levels of teachers in lesson planning and delivery



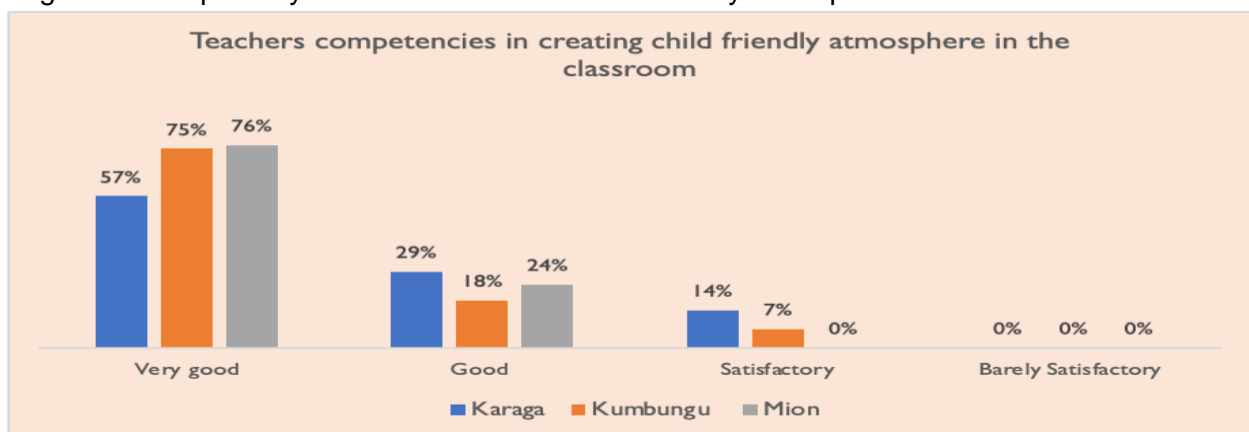
The findings also showed that the roll-out of the TPD Model in the selected schools have improved the competencies of teachers in their relations with the pupils. The evidence as adduced in Figure 4 showed that majority, 56% in Karaga, 75% in Kumbungu and 54% in Mion were rated as having very good competencies in teacher-pupil relations. This was demonstrated by the teachers using starters to create rapport between them and the learners, teacher motivating and inviting questions from pupils during the lesson, teachers encouraging active participation of pupils in lesson through oral questions that demand short answers, teachers using a variety of assessment procedures to obtain feedback on pupils learning, such as short tests/quizzes, homework, group tasks, assignments, teachers providing prompt feedback on assignments given to pupils to support and motivate their learning, teachers being very approachable and friendly to pupils, teachers being willing to assist pupils overcome their learning problems/misconceptions outside the classrooms, teachers reflecting critically with learners during the teaching and learning process, and teachers accepting constructive feedback to improve and refine teaching and learning.

Figure 4: Competency levels of teachers in relations with pupils



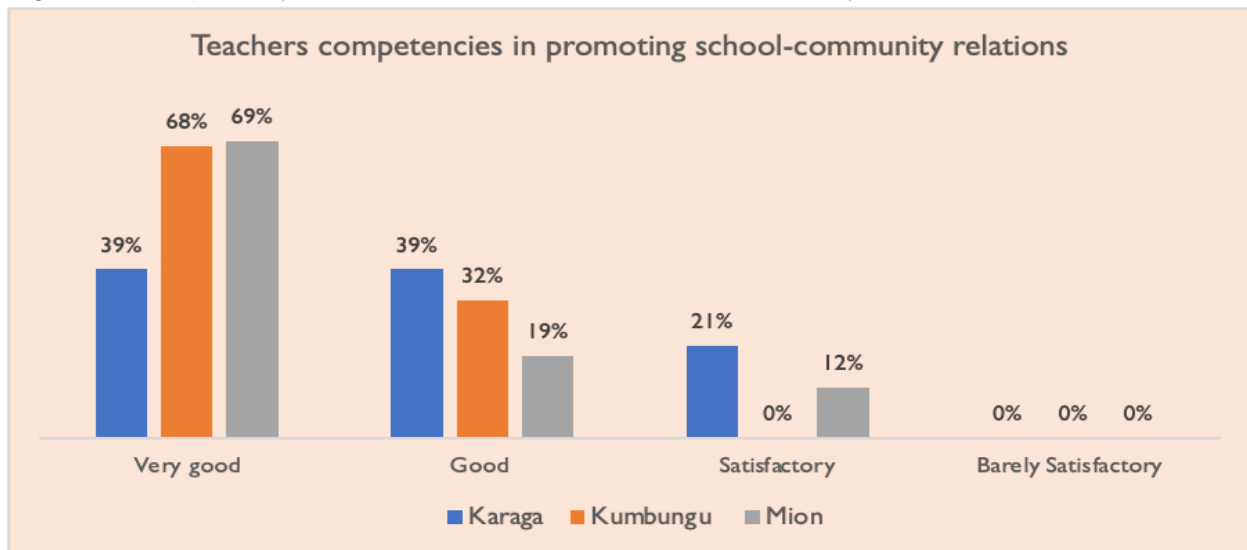
The findings on the assessment of teachers' competencies in creating child friendly atmosphere in the classroom to promote effective learning showed a positive impact of the TPD Model. The findings as shown in Figure 5 indicate that 57% of the teachers in Karaga, 75% in Kumbungu and 76% in Mion as demonstrating very good competencies in creating child friendly atmosphere in the classroom and effective class management. This was portrayed by the teachers treating all pupils fairly and firmly, teachers starting the lessons at the allotted time, teachers establishing ground rules to control and manage misbehavior promptly and constructively in class, teachers dressing decently, teachers demonstrating creativity and innovation, teachers exhibiting appropriate professional conduct as in being decorum in their speech and behavior, teachers promoting independent thinking by the pupils and teachers also ensuring that the classroom is clean and furniture well arranged.

Figure 5: Competency levels of teachers in child friendly atmosphere in the classroom



The findings from the assessment also showed the positive impact of the TPD Model in promoting good teacher-community relations. Figure 6 shows that 68% of teachers in Kumbungu and 69% of teachers in Mion exhibited very good competencies in teacher-community relations. However, in Karaga a lower percentage, 39% of teachers were rated as very good and another 39% rated as good in terms of teacher-community relations.

Figure 6: Competency levels of teachers in school and community relations



Key informant interviews with the head teachers and focus group discussions with the PTAs/SMCs confirmed that, teachers since the roll-out of the TPD Model have been issuing regular end of term examination reports to the parents of the pupils and also do invite parents to discuss the academic performance of their wards. The teachers also organized extra classes for pupils over the weekends, and actively participated in PTA meetings.

The general impression from the impact assessment is that the TPD Model has created a more stimulating learning environment in the E4L programme schools. A few direct quotations and testimonies from the headteachers, DTSTs, PDCs, SISOs, PTA and SMCs members are documented below.

“Before the roll-out of the TPD Model, enrolment was very low in our school and the pupils were not regular to school as well. The parents were burning charcoal in the school which was not appropriate. Teaching methodologies were largely teacher centred, mostly requiring pupils to memorize facts. Teachers used limited teaching and learning resources with the excuse that government has not provided textbooks and other learning materials. I struggled with my teachers to ensure they prepare their schemes of learning and lesson notes. This is no longer the situation. Our school enrolment has increased. The charcoal burning has stopped because of the good relations between the school and the community. Pupils are

now regular in school and the teachers involve the pupils in the teaching and learning process. Learner centered methodologies have been adopted by teachers and has positively affected teaching and learning. The teachers have also kept learners in study groups and assign them projects to undertake in order to improve their reasoning and creativity skills. The TPD Model places emphasis on the importance of preparing schemes of learning and lessons notes and these are adhered to by all the teachers in my school now. Gender friendly pedagogies have also been adopted in the school through the introduction of the TPD Model”.

Key Informant Interview with Headteacher in Karaga district

“SfL has organized trainings for us on our roles and responsibilities as executives of the PTA. This includes the need for us to support the school management to improve teaching and learning. As a result of these trainings, we have been able to mobilize resources and constructed a teacher’s quarters to accommodate our teachers. We also support the feeding of teachers by providing them food items particularly yams. We successfully lobbied the District Assembly for a three-unit classroom block”.

FGD with PTA in Mion district

“Due to the education we received from the SfL , E4L programme on the importance of good school and community relations we have been able to do the following for our community school:

- We constructed urinary pits for the school,
- We connected electricity to teachers’ quarter,
- We repaired the damaged roof in one of the classrooms.

We therefore see SfL as a valuable partner in improving teaching and learning in our community”

FGD with SMCs members in Kumbungu district

“The TPD Model is a game changer in our schools. We need to advocate for it to be replicated across many more schools”.

SISO, Mion District

“The TPD Model in my view is a useful one for improving teaching and learning in our schools. SfL needs to advocate for the incorporation of the model into the professional learning communities (PLC).

DTST member, Karaga District.

“The TPD Model is certainly a useful tool for the pre-and post-training of teachers. My recommendation is to incorporate it into the curriculum of the CoEs”.

PDC, Tamale CoE.

Source: Field Assessment, 2023

3.3 Impact of TPD Model on Learning outcomes

One of the cardinal objectives of the TPD Model impact assessment, was to establish whether the roll-out of the model has impacted positively on learning outcomes in the selected schools or not.

To measure the impact of the TPD on learning outcomes, the assessors used learner results (2021) prior to the implementation of the TPD model as baseline (when learners were in P2) and tracked the change in learning gains of these same learners (now in P4). In essence, the assessment tracked the change in learning gains of these same learners over the period of 2021 to 2023. The assessment involved three subject areas namely Mathematics, English Language and Science as captured in Table 3.

In Table 3, some gains were observed in Kplingini primary, where pupils' mean scores across the subject areas examined at the end of P4 were compared with that observed in P2 which served as reference or baseline performance or comparison purposes in this study. While the grand mean for mathematics in P2 was 48.18, that of P4 appreciated to 58.48, reporting a difference of 10.3, and represented a significant change in the mean scores.

The change in mean scores in mathematics represented a gain in learning the subject attributable to the intervention implemented from 2021 to 2023.

Again, pupils' mean scores reported in English language also increased from 45.61 to 45.76, representing a minimal change. Pupils' mean performance in science was observed to increase from 43.79 in P2 to 50.30 in P4 representing an improvement in learning gains. Reports on pupils' mean performance at Sambu primary, also in the Mion showed similar patterns in improvements as observed in Kplingini school. Positive mean differences were observed in Mathematics, English language and Science between grand mean scores for each of the respective subject areas examined. These positive mean scores differences represented gains made in learning and an improvement in pupils' learning across these classes.

Kumbungu district as a participating district presented two schools for the study, these were Gingani primary and Nwogu A. M. E Zion primary. Pupils' mean scores in like manner showed an increment in their overall performance in Mathematics, English language and Science between P2 and P4. It was observed that unlike the average gains in learning across the subjects in the Mion district, the general gain in mean performance across the schools in the subjects examined were positive and above average relative to their performance at the baseline in P2.

Pupils' mean performance in the subjects in Karaga district showed remarkable differences between P4 and P2. While the grand mean score reported in Mathematics at P4 was 73.78, that recorded for same subject in P2 was 68.67 representing a mean difference of 5.11. Similar gains were observed in English language where the mean scores increased from 73.71 in P2 to 76.22 in P4. In similar, whilst learning gain for Science was positive as shown by the the increase in the grand mean score from 72.16 for P.2 to 72.78 for P.4, it was a relatively a small learning gain..

Table 3: Scores Earned in each term for P2 and P4.

CLASSES TESTED	SUBJECTS EXAMINED IN THE SCHOOLS	NAME OF SCHOOLS INVOLVED IN THE STUDY	Mean	N	Std. Deviation
CLASS 2	MATHEMATICS	KPULGINE ISLAMIC PRIMARY	48.18	66	14.132
		SAMBU ISLAMIC PRIMARY	66.97	66	17.769
		GINGANI R/C PRIMARY	52.70	66	10.960
		NWOGU ZION PRIMARY	71.22	108	11.773
		KARAGA NURI ISL. PRIMARY	68.67	102	13.956
		Total	63.17	408	16.359
		ENGLISH LANGUAGE	KPULGINE ISLAMIC PRIMARY	KPULGINE ISLAMIC PRIMARY	45.61
SAMBU ISLAMIC PRIMARY	58.61			66	15.296

	GINGANI R/C PRIMARY	46.89	66	8.254
	NWOGU ZION PRIMARY	66.42	108	12.739
	KARAGA NURI ISL. PRIMARY	73.71	102	13.268
	Total	60.45	408	17.247
SCIENCE	KPULGINE ISLAMIC PRIMARY	43.79	66	14.651
	SAMBU ISLAMIC PRIMARY	66.70	66	16.968
	GINGANI R/C PRIMARY	50.70	66	5.860
	NWOGU ZION PRIMARY	70.71	108	10.521
	KARAGA NURI ISL. PRIMARY	72.16	102	13.143
	Total	62.83	408	16.766
Total	KPULGINE ISLAMIC PRIMARY	45.86	198	15.148
	SAMBU ISLAMIC PRIMARY	64.09	198	17.073
	GINGANI R/C PRIMARY	50.10	198	8.903

		NWOGU ZION PRIMARY	69.45	324	11.874
		KARAGA NURI ISL. PRIMARY	71.51	306	13.581
		Total	62.15	1224	16.825
CLASS 4	MATHEMATICS	KPULGINE ISLAMIC PRIMARY	58.48	66	9.805
		SAMBU ISLAMIC PRIMARY	65.24	66	18.339
		GINGANI R/C PRIMARY	48.77	66	9.630
		NWOGU ZION PRIMARY	68.61	98	14.671
		KARAGA NURI ISL. PRIMARY	73.78	102	11.388
		Total	64.41	398	15.656
	ENGLISH LANGUAGE	KPULGINE ISLAMIC PRIMARY	45.76	66	17.459
		SAMBU ISLAMIC PRIMARY	68.47	66	16.818
		GINGANI R/C PRIMARY	47.14	66	7.632
		NWOGU ZION PRIMARY	59.96	102	11.950

	KARAGA NURI ISL. PRIMARY	76.22	102	11.048
	Total	61.04	402	17.596
SCIENCE	KPULGINE ISLAMIC PRIMARY	50.30	66	19.052
	SAMBU ISLAMIC PRIMARY	67.22	65	15.038
	GINGANI R/C PRIMARY	51.20	66	9.337
	NWOGU ZION PRIMARY	64.38	108	11.819
	KARAGA NURI ISL. PRIMARY	72.78	102	11.576
	Total	62.52	407	15.934
Total	KPULGINE ISLAMIC PRIMARY	51.52	198	16.731
	SAMBU ISLAMIC PRIMARY	66.97	197	16.762
	GINGANI R/C PRIMARY	49.04	198	9.021
	NWOGU ZION PRIMARY	64.26	308	13.261
	KARAGA NURI ISL. PRIMARY	74.26	306	11.394

		Total	62.65	1207	16.462
Total	MATHEMATICS	KPULGINE ISLAMIC PRIMARY	53.33	132	13.173
		SAMBU ISLAMIC PRIMARY	66.11	132	18.008
		GINGANI R/C PRIMARY	50.73	132	10.464
		NWOGU ZION PRIMARY	69.98	206	13.262
		KARAGA NURI ISL. PRIMARY	71.23	204	12.962
		Total	63.78	806	16.018
	ENGLISH LANGUAGE	KPULGINE ISLAMIC PRIMARY	45.68	132	16.905
		SAMBU ISLAMIC PRIMARY	63.54	132	16.761
		GINGANI R/C PRIMARY	47.02	132	7.919
		NWOGU ZION PRIMARY	63.28	210	12.750
		KARAGA NURI ISL. PRIMARY	74.96	204	12.243
		Total	60.75	810	17.413

SCIENCE	KPULGINE ISLAMIC PRIMARY	47.05	132	17.243
	SAMBU ISLAMIC PRIMARY	66.95	131	15.980
	GINGANI R/C PRIMARY	50.95	132	7.769
	NWOGU ZION PRIMARY	67.55	216	11.605
	KARAGA NURI ISL. PRIMARY	72.47	204	12.357
	Total	62.67	815	16.346
Total	KPULGINE ISLAMIC PRIMARY	48.69	396	16.189
	SAMBU ISLAMIC PRIMARY	65.53	395	16.959
	GINGANI R/C PRIMARY	49.57	396	8.967
	NWOGU ZION PRIMARY	66.92	632	12.825
	KARAGA NURI ISL. PRIMARY	72.89	612	12.600
	Total	62.40	2431	16.644

Source: Class scores, 2023

The general observations of mean score differences across the subjects covered in the schools selected indicated a statistically significant difference in the pupils' mean performance. This

decision is supported in Table 4, where the sig or p-value ($p=.000 < 0.05$), is less than the alpha (α) level. *The decision therefore was to reject the claim of no mean difference in performance in each of the subject areas and to accept the fact that, there were marked differences in mean scores of pupils between P2 and P4 as supported by this p-value ($p(.000) < 0.05$). This suggested that, the intervention carried out on pupils learning brought about gains or changes in their learning as a result of the intervention.* Based on the statistically significant decision on the performance of pupils in schools involved in the study, it can be concluded that the use of knowledge and skills acquired from training on TPD model made a positive mark on teachers approach to teaching and gains in learning.

Table 4. Measure of significant difference

Scores Earned in Each term * Names of Districts Involved in the Study	Groups	Sum of squares	df	Mean square	F	Sig.
	Between groups	94342.102	2	47171.051	197.871	.000
	Within groups	578817.057	2428	238.393		
	Total	673159.159	2430			

To support and concretize the significant conclusions arrived at relying on the data, this study further sought to quantify the size of the effect made by the intervention using Cohen's d for the calculation of effect size. According to Coe cited in Cohen et. al (2007), an effect size is the quantification of the difference or a measure of the effectiveness of a treatment between any two groups.

Several different calculations of effect size exist in literature including Richardson, 1996; Caparo and Caparo, 2002; r^2 , adjusted R^2 , η^2 , ω^2 , Cramer's V , Kendall's W , Cohen's d , and Eta. Like the correlation coefficient, r , the effect size assumes values between 0 and 1. Cohen et. al (2007), further provided guidelines for interpreting various ranges of effect size estimated as follows: 0 – 0.20 (weak effect), 0.21 – 0.50(modest effect), 0.51 – 1.00 (moderate effect) and >1.00 (strong effect). From Table 5, Eta squared value reported for effect size in this study is 0.14, which according to the guidelines is a moderate to large effect. This effect size suggests that the intervention made a moderate or above average to a large effect on the learning outcomes of the pupils in the schools. This moderate to high effect of the TPD model on learning gains and

outcomes has wider implications for its application across the schools in the districts. It suggests that learners gained and improved a lot more in the learning outcomes in the subject areas examined.

Table 5: Measures of Association

	Eta	Eta Squared
SCORES EARNED IN EACH TERM * NAMES OF DISTRICTS INVOLVED IN THE STUDY	.374	.140

Based on the findings of the impact assessment, the following conclusions can be drawn relative to the TPD:

1. It emerged that pupils' mean performance across the three subjects involved in the study improved averagely (appreciated moderately) between the before- and -after the implementation of the TPD model in the classrooms. This means in simple terms that the application of the TPD model by teachers in the classrooms resulted in between average and above average gains in the pupils' learning and performance.
2. Again, it was found that, an eta value of 0.374 (eta squared=0.14), representing 37.4 percent in improvement in pupils' learning gains, accounted for by the impact attributable to application of the TPD model by teachers, teaching content in the respective subjects involved in this study. In terms of percentage, around 37.4% (Table 5), equivalent to the size of the change (effect size) in pupils' learning gains accounted for by the implementation of the TPD model in the classrooms. As indicated earlier, the eta value represents the effect size or how much impact or improvement the use of the TPD model made on pupils' learning gains and outcomes.

3.4 Return on Investment for TPD Model

The third objective for the TPD Model impact assessment relates to value for money. It sought to establish whether the costs and benefits associated with the implementation of the TPD Model was worthwhile.

Whilst the ToR recommended the use of Return on investment (ROI) calculated as $ROI = (\text{Cost of Investment} / \text{Net Profit}) \times 100$ often used to justify decisions to engage in new investment, this may not be an appropriate measure given that the financing of the TPD was not from commercial

sources. Yet there is ample evidence from the study that show that the TPD model has generated significant social returns on investment. The business case for the adoption of the TPD model could therefore be argued from the following angles:

First is its contribution to learning gains. The analysis showed that for example the grand mean for mathematics in P2 was 48.18, but was 58.48 for P4. The difference of 10.3, therefore represents a significant change in the mean scores which is attributable to the TPD Model.

Second, the TPD investment resulted in enhanced collaboration between school management and parents. A clear testimony can be cited of the School Management Committee members from Karaga district. They observed as follows “Due to the education we received from the SfL , E4L programme on the importance of good school and community relations we have been able to construct urinary pits for the school, connected electricity to teachers’ quarter and repair the damaged roof in one of the classrooms.

Third, the teachers also confirmed the increase in school enrolment and attendance as a result of the improved community-school relations as a result of the TPD. This is confirmed by the remarks from a headteacher in a beneficiary school in the Karaga district, who observed that “Before the roll-out of the TPD Model, enrolment was very low in our school and the pupils were not regular to school as well. Now our school enrolment has doubled and pupils are more regular in school”.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations based on the findings of the study are presented below.

4.1 Conclusions

Based on the findings the following conclusions can be drawn.

First, it can be concluded that the TPD Model is very relevant because the new standard-based curriculum in Ghana places a high premium on CPD. This could be through INSET and Professional Learning Community (PLC) sessions. The TPD Model therefore has come to address the gaps experienced in promoting the CPD for teachers. The findings from this assessment also show that teachers and education authorities all support the roll-out of the TPD Model because of its positive impact on teaching and learning in the schools.

Second, the impact assessment has demonstrated empirically that the TPD Model has contributed to learning gains in the beneficial schools. This is evident in the high mean scores documented in the report.

Third, the TPD Model has improved school-community relations resulting in increased school enrolments and attendance, with community members willingly mobilizing resources to improve school infrastructure and holding teachers and school management accountable.

Fourth conclusion is that, the TPD Model has promoted active learning through the use of learner-centred pedagogies. Learners' creativity and analytical capacities are encouraged. Their confidence is boosted in class making them comparable to their peers in the other parts of the world.

4.2 Recommendations




Based on the findings, the following recommendations are made.

1. SfL and GV should explore ways of scaling up the up TPD Model to many more schools. The roll-out of the TPD Model in districts and schools should commence with a baseline survey to ensure robust tracking of the achievements of the TPD Model. Negotiations could be held with district stakeholders to identify treatment and control schools to ensure comparison in the changes in learning outcomes that can be attributable to the TPD Model.
2. SfL should advocate for the adoption and accreditation of TPD Model by NTC and NaCCA for CPD and INSET for teachers. This will motivate many more teachers to make themselves available for training at their own cost since their participation in the TPD Model trainings will help them accumulate the needed points for their promotions.
3. SfL could also explore the possibility of signing MoUs with some selected CoEs, and training some tutors in their colleges to roll-out the TPD Model as part of the training of teachers. This could serve as a basis for the adoption of the TPD model into the CoE curriculum if there is evidence to show a high pass rate of graduates in the teacher licensure examination.
4. The TPD Model should also target Kindergarten teachers. Early Childhood Educators need to understand child development and how to use learning through play (LTP) methodologies in teaching children at that tender age.
5. To be able to make a case for the nationwide adoption of TPD Model, SfL should partner with the district education offices to assess the social return on investment on government organised INSET to compare which of the two CPD models is more efficient.

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ANNEXES

Title	Document
1. ToR	 Terms of Reference.docx
2. Data Collection Tools	 Data Collection Tools.docx
3. Interview summaries	 SfL TPD Model Assessment - Summ.