Phase III

Interim Report on Master and Step-Down Training in Ghanaian Colleges of Education for IDP Foundation, Inc. and Sesame Workshop's Techniques for Effective Teaching

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Executive Summary

Project Overview

NORC at the University of Chicago is conducting a study of the third phase of the Techniques for Effective Teaching (TFET) program. During prior Phases I and II, the TFET program partnered with 127 private, low-fee primary schools across eight regions in Ghana to strengthen the capacity of early grade teachers (KG1-P3) to use child-friendly and inclusive teaching approaches. Phase III is the newest piloting phase of the program supporting the use of pupil-centered techniques by college faculty and student teachers within 46 Colleges of Education in Ghana. The roll out of TFET in the colleges takes place alongside broader national reforms to teacher education curriculum and training that promote similar constructivist theories of learning and pupil-centered pedagogy.

The purpose of NORC's Phase III research project is two-fold. First, the project's central aim is to generate insights into the efficacy of this newest phase by examining perceptions of TFET training effectiveness, understandings of key pedagogical concepts, and application of pupil-centered techniques in classrooms. The project's secondary aim is to support the on-going design of TFET by exploring how the Phase III training model fits within the broader context of pupil-centered reform to teacher education in Ghana. Throughout this report we present findings from an online survey and semi-structured interviews with Master and Step-Down training participants gathered between August and October 2021. The design of this study is informed by earlier phases of TFET training and where relevant, makes connections to prior TFET research.

Teacher Education Reform in Ghana

The roll out of TFET Phase III is happening during an overhaul to the national teacher education curriculum in Ghana that promotes similar principles of constructivist theory and pupil-centered pedagogy. In September 2017 the last cohort of students registered to start a 3-year Diploma in Basic Education, referred to in this study as the 'old' curriculum. The following year in 2018 the first cohort of students began a 'new' 4-year Bachelor of Education degree. Under the old curriculum students had two years of coursework and exams at college followed by a practical year in schools. In contrast, under the new curriculum, teaching practice is embedded into coursework starting in year 1 with students spending progressively more time in schools each year. Under both the old and new curricula, students complete a year of national service before becoming a fully licensed teacher. The TFET Phase III program aims to enhance the on-going work that colleges are doing to reform how teachers are prepared and to support the adoption of more inclusive, pupil-centered pedagogy.

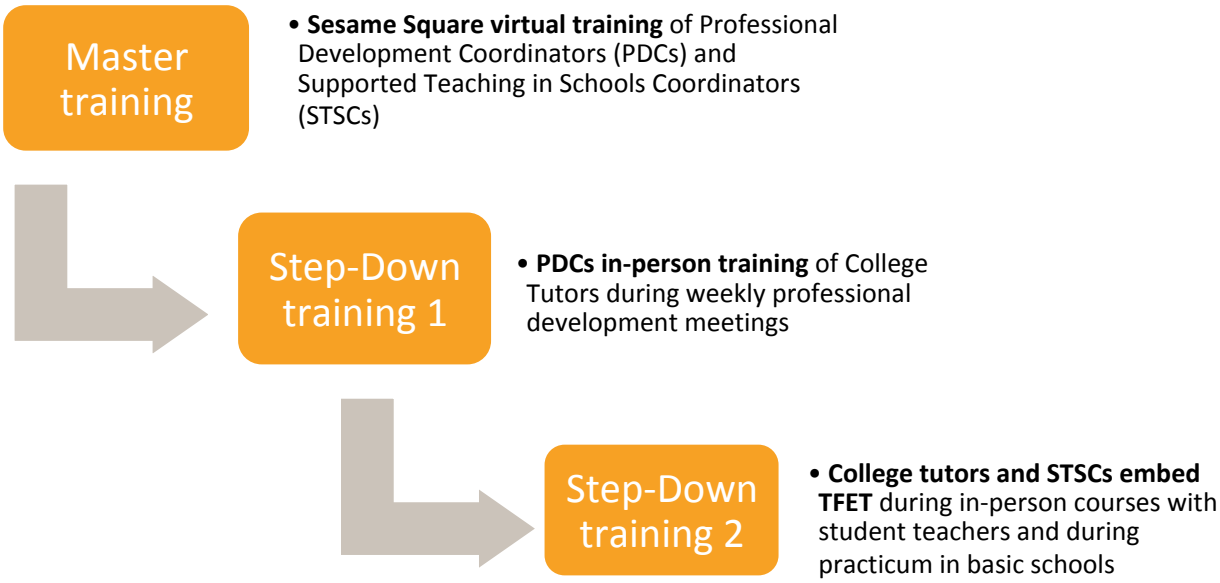
Summary of TFET Phase III Program Design

Within the 46 Colleges of Education in Ghana, Phase III of TFET follows a modified cascade "train the trainer" model with two main differences from Phase II. The first difference is the revision of TFET material, which excluded modules 5 and 6 on pupil-centered techniques for learning English literacy and mathematics. Several modules were also combined so that program content was covered over 10 training sessions. Although in earlier phases TFET was designed to support the in-service uptake of pupil-centered techniques by primary grade teachers, Phase III supports the pedagogic needs of educators and learners within higher education institutions. The backgrounds of training participants in the Colleges of Education span a variety of specialisms and grade levels, such as Science Education and secondary school.

Phase III of TFET also added a third level of cascade training. In prior phases the training model comprised two levels (one master and one Step-Down). In Phase III, participants were trained at one master and two different Step-Down training levels. The master training consisted of 10 sessions held between the 12th of October and the 27th of November in 2020. All sessions were held online and led by the Sesame Square team. The Master trainees were the Professional Development Coordinators (PDCs) and Supported Teaching in Schools Coordinators (STSCs) from the 46 Colleges of Education. Following the master training, the first level of Step-Down occurred in the colleges when the PDCs held their weekly professional development meetings with college tutors. The first level of Step-Down with tutors began the week of 11 January 2021 and was expected to mirror the master training sessions held by Sesame Square. PDCs were expected to use the 14 TFET YouTube videos and newly revised training manual during their weekly professional development sessions.

At the second level of Step-Down, tutors were expected to integrate TFET into their courses with student teachers studying under the new Bachelor of Education curriculum while on campus. Student teachers were also expected to receive TFET from STSCs during their practicum work in schools for one day a week. Rather than mirroring the master training, college tutors and STSCs were tasked to incorporate program content into the general training and mentoring of student teachers. Between the tutors and STSCs, student teachers should have "received" the TFET training by the middle of 2021. Figure 1 below summarizes the intended cascade training structure of TFET Phase III.

Figure 1. Overview of TFET Phase III Intended Training Structure within 46 Colleges of Education



Research Methods and Objectives

Between August and October 2021, we used a mixed methods research design to gather complementary forms of data on the implementation of TFET Phase III training. These data were gathered from online surveys and semi-structured interviews with training participants and focused on understandings of pupil-centered teaching and TFET training experience. The online survey produced a total of 40 Master and Step-Down trainee respondents representing 22 of the 46 Colleges of Education. From these surveys, we selected eight case study colleges where eight Master trainees and six Step-Down trainees were then interviewed by trained fieldworkers over the phone to explore the quality of training and program understandings. Interview data provided a more in-depth view of training processes, theories of learning, and how the new Bachelor of Education curriculum is being implemented in the colleges. Survey and interview data provided a more complete understanding of training quality within a context of broader pupil-centered reform.

This interim report on the Phase III Master and Step-Down training is the first in a series of reports and aims to answer the following research questions:

1. *What are the main implementation challenges and successes to the TFET training within colleges of education in Ghana?*

2. *How does the TFET program support the on-going work of curriculum reform in this context?*

Findings and Conclusions

Throughout this report we present findings from the Phase III Master and Step-Down training study. The following are key conclusions from this work organized by theme.

TFET Phase III Training

- Survey and interview data showed that most Master and Step-Down trainees felt confident or "well prepared" teaching other teachers to use TFET approaches, and felt most confident to train other teachers to use pupil grouping. A few trainees reported feeling less prepared to train others due to TFET's similarity to how tutors currently teach and because of the poor network connection during the virtual Master training. Network connection presents a broader challenge to teaching and learning across the Colleges of Education and basic schooling system in Ghana.
- Across the eight case study colleges, on average, Master trainees taught the TFET program to 26 participants who varied by role and area of specialization. All Master trainees reported teaching college tutors and most also taught PDCs. About half of Master trainees taught STSCs and other administrative or non-teaching staff. At two colleges Virtual Learning Troubleshooters participated in the training. At seven of the eight colleges, Master trainees reported training individuals from at least six different backgrounds or specialisms.
- The number of student teachers taught by the six interviewed Step-Down trainees varied widely from 17 to 1,058 in total. In some cases tutors reported teaching more than one cohort level. Of the six Step-Down trainees interviewed, five reported teaching students within the Early Childhood and/or Primary Education program, and four taught students in at least four different programs.
- Although TFET content was designed to support the pedagogy of Early Childhood educators, Step-Down training was offered to a wide variety of faculty, staff, and student teachers at the eight case study colleges with specialisms outside Early Childhood Education.
- Of the 40 online survey respondents, most had taught Modules 1 and 2 to others in their college (70% and 75% respectively). More than half of the 33 Master trainees had also taught other TFET modules while none of the 7 Step-Down trainee respondents reported teaching modules other than Modules 1 and 2. Across the 40 respondents, 12.5% said they had not taught the TFET techniques to anyone else yet.
- Interview data showed that program coverage varied between five and 12 modules during Step-Down training. By module, all trainees reported stepping down Module 2 on developing a child-friendly classroom and Module 4 on low-cost materials. Both modules were reported as the most useful content from survey and interview data. These findings suggest trainers may prioritize particular TFET content during Step-Down by its relevancy or usefulness to participants.
- The first level of Step-Down training occurred between February and August 2021 and varied between the eight case study colleges. Seven of the eight Master trainees reported training others once a week, and four of those seven reported training over a three-month period. Another two trained between 2-4 hours per week during one month. At the second level of Step-Down, findings suggest college tutors embedded techniques into their courses at least once a week after they received training.

- Each of the 14 trainees interviewed reported to model at least one kind of pupil-centered technique while conducting Step-Down training, and most reported grouping participants in different ways, including by ability, by mixing ability, and by department (e.g. mathematics, science, etc.).
- Eight trainees reported co-teaching program techniques during Step-Down with other faculty in their college to supplement their expertise in particular areas, such as assessment and evaluation.
- Across interview data, Master and Step-Down trainees described a similar training approach that involved a combination of participant grouping, engaging with videos and other materials, and discussing pupil-centered teaching in small and whole class groupings. These strategies mirror how trainees' conceptualized pupil-centered teaching.
- The concepts of "low-cost" materials and "positive" discipline were most frequently reported as challenging to teach due to diverse perspectives on what counts as "low" and large class sizes that require more traditional forms of discipline.
- Six Master trainees reported not having enough time to cover TFET content during their weekly professional development sessions, which parallels findings from Phase II reporting. Five trainees also cited network connectivity as a challenge to sharing TFET materials and videos before and during Step-Down training. Other reported challenges were the diverse specializations of training participants, which made it harder to teach program content, and inconsistent participation from tutors due to their heavy workloads.
- Overall, Step-Down trainees reported fewer challenges to teaching the TFET program; however, large class sizes, a lack of instructional time for TFET, and a lack of resources made stepping down to student teachers difficult for a few trainees.

Pupil-centered Techniques

- At the case study colleges, most trainees reported using at least some pupil-centered techniques *before* receiving TFET, and four reported mainly lecturing, or a more teacher-centered style of pedagogy. None described their pedagogic style as mainly teacher-centered *after* receiving TFET, and all 14 respondents identified the use of at least some pupil-centered techniques.
- After receiving TFET, half of the interview respondents reported adopting 'active learning' techniques (where students actively engage, discuss, or experiment with content). In addition, four Master trainees reported the use of low-cost materials during their lessons.
- About one quarter of survey respondents said the most useful program content for teaching other adults was Module 4 on developing low-cost materials. Similarly, at the case study colleges, six of 14 trainees said developing low-cost materials was the most useful part of TFET training for tutors and students. This is likely due to a commonly reported challenge with accessing teaching resources in colleges and at basic schools. For trainees, Module 4 presented a potential solution by creating innovative materials at little to no cost, suggesting its applicability to the college context.
- All interview participants agreed, "pupils learn better when lessons build on their experiences at home and in the community." Building on a pupil's prior knowledge and experience during lessons emerged as a central theme in this study and perceived by trainees as an effective technique for learning.

- Findings from survey and interview data showed that PDCs, STSCs, and tutors hold a mostly constructivist, pupil-centered orientation to teaching and view several TFET-style techniques as effective for learning, especially role-play, student grouping, and differentiation. At the same time, data showed that some college faculty also value elements of traditional pedagogy, especially lecturing.
- Study participants expressed a similar conception of pupil-centered teaching that reflects several TFET approaches. The teacher is seen as a "facilitator" of learning that supports pupils as they explore materials together in groups. The teacher moves around the room, observing and giving feedback to students who should be talking more than the teacher. At the end of a pupil-centered lesson, students present their ideas to the class while the teacher manages the discussion.
- Although Module 9 on differentiation was only covered by a quarter of master trainees and two-thirds of Step-Down trainees, survey and interview data revealed that trainees understood how to use a wide variety of differentiation techniques that promote pupil-centered learning as presented within TFET.
- Bottle tops and objects from nature, such as sticks and stones, were most frequently named as low-cost resources for teaching math by survey respondents. Responses showed trainees understood how those teaching materials can be used to support pupils' *conceptual* development in early grade numeracy, especially for number concept, place value, and data representation.
- Classroom management and positive discipline stood out to participants as a useful and distinctive module that most Master and Step-Down trainees taught to others in their college. Although, the module continues to challenge trainees' traditional norms of discipline in schooling contexts, respondents also cited a wide variety of positive strategies for addressing the behavior of talkative students.
- Overall, findings suggest TFET potentially *enhanced* participants' existing repertoire of pupil-centered techniques for active learning and offered innovative approaches for developing teaching and learning materials. As a result, TFET may impact on how trained participants *think about* their pedagogy and potentially, how they carry out instruction.

Teacher Education Reform in Ghana

- Without prompting, six interview participants reported receiving trainings on pupil-centered instruction *before* receiving TFET (e.g. from the Transforming Teaching, Education, and Learning Project). Interview data also showed trainees were grouping pupils prior to receiving TFET. It is likely most trainees in this study received a similar kind of pupil-centered training to support the implementation of the new teacher education curriculum from T-TEL and/or other similar programs.
- TFET is generally seen as complementary to the on-going work that colleges are taking up to reform teacher education for promoting a pupil-friendly, inclusive learning environment. Student grouping and discussions were cited during interviews as the main similarities between TFET and other pupil-centered trainings. In contrast, positive discipline, developing low-cost materials, and supporting students with disabilities stood out to participants as unique to the TFET program.
- Trainees described the new B.Ed. curriculum as more pupil-centered than the old with an emphasis on activity-based learning. More specialized programs and courses under the new curriculum now integrate pedagogy with content knowledge. Under the old curriculum an exams-driven culture prioritized the acquisition of content knowledge.

Despite these changes, tutors find it challenging to align the new activity-based methods with on-going standardized exams.

- A lack of access to sufficient print and virtual resources in basic schools continues to challenge student teachers' adoption of pupil-centered techniques. Moreover, strategies to adapt techniques for large classes and on-going professional development may enhance student teachers' understanding and motivation to use pupil-centered approaches.

In conclusion, TFET Phase III was a timely, well-positioned program for supporting the on-going work of colleges in implementing the new B.Ed. curriculum. Training participants' prior knowledge and experience with pupil-centered instruction suggests TFET played a complementary role, potentially enhancing college faculty's existing repertoire of pupil-centered approaches. Recommendations include strategies for expanding the scope and quality of Step-Down training within the colleges of education.

Research Methodology

Between August and October 2021, we used a mixed methods research design to gather complementary forms of data on the implementation of TFET Phase III training. These data included a combination of closed-ended survey items on training experience and open-ended interview items on conceptual understandings of pupil-centered ideas, training approaches, and curriculum reform. Survey data produced insights on training quality across 22 unique Colleges of Education, while interview data allowed us to explore successes and challenges of Phase III training in greater depth. Interviews were conducted with 14 training participants representing eight case study colleges. In what follows we describe our sampling, design, and analytical approaches to the online survey and case study methods.

Online Survey

Sampling of TFET Phase III Training Participants

Beginning in August 2021, NORC disseminated online surveys to Master trainees from the 46 Colleges of Education that had participated in the Master training conducted by Sesame Square. From a list of 84 Master trainee contacts provided by IDP Foundation, 3 contacts could not be reached with the contact information given. An initial email was sent to 81 Master Trainee contacts on 3 August 2021, with a follow up email sent 10 days later. In addition to email, survey links were distributed via Whatsapp to trainees who had not yet responded on 24 August, with a final follow up message sent on 2 September 2021. At the end of the dissemination period, NORC received 42 total survey responses, of which 7 were incomplete and 2 did not provide consent. This produced a final sample of 33 survey responses (41% response rate) for the Master trainee Survey.

Our original research design was based on the understanding that we would have access to program monitoring data which would provide details of Step-Down training at each college together with lists of all participants at such training. In the absence of these lists, we requested Step-Down trainee contacts from Master trainees that participated in interviews at our eight case study colleges (see section on semi-structured interviews below). From the eight trainees we interviewed, six provided lists, totaling 72 Step-Down contacts. Using those six lists, an initial email was sent to 39 contacts on 29 September 2021, with a follow up email sent on 12 October. Additionally, a Whatsapp message was sent to 42 participants on 14 October, and another round of follow ups sent on 4 November 2021. At the end of the dissemination period, NORC received 10 total responses, of which 3 were incomplete. This produced a final sample of 7 responses (10% response rate) for the Step-Down trainee Survey. Despite a relatively low response rate from Step-Down trainees, the final sample of 40 survey responses (33 Master and 7 Step-Down) provided sufficient information to examine patterns in training quality and conceptual understanding.

The online survey gathered background data on trainees' highest educational qualification, early grade teaching experience, academic specialization, and primary role within their college. Overall, 22 unique colleges were represented across the 40 survey respondents. Most colleges had one or two Master trainees represented. Table 1 shows the distribution of the 40 survey responses by the university that the college is affiliated to. Across all respondents, 58% defined their primary role as Tutor, including 86% of Step-Down Trainees and more than 50% of Master Trainees. Professional Development Coordinator (PDC) was the second most common role represented by 12% of Master trainees and one Step-Down trainee.

Table 1. Affiliated University of Online Survey Respondents

Affiliated University	Number of respondents
KNUST	5
UDS Tamale	10
UEW. U-TVET	4
UEW. Winneba	7
University of Cape Coast	10
University of Ghana	2

By subject area, 42% of Master trainees had experience teaching or supporting students in Education and Professional Development. There were no Step-Down trainees with this area of specialization. Experience teaching Early Childhood or Primary Education courses was reported by 29% of Step-Down trainees and 18% of Masters. About one-quarter of Master and Step-Down trainees taught Math and ICT. Subject areas taught the least by survey respondents were Language, Vocational and/or Technical, and Social Sciences. Self-reported teaching experience showed more than 60% of Master and Step-Down trainees had taught

P3. Only 10% of all trainees had experience teaching KG1 and KG3. Finally, almost all Master trainees surveyed held a Masters degree or higher, and all Step-Down trainees reported a Masters degree. For a complete list of summary tables on respondent background data, see Appendix A.

Online Survey Design

The online survey elicited responses from Master and Step-Down trainees on their education background, perception of training effectiveness, understanding of TFET content, and experience with Step-Down training. The survey included vignettes, imagery, open and closed-ended questions, and items that probed trainees' level of agreement with statements about pupil-centered learning. The survey tools for the Master and Step-Down trainee survey can be found in Appendices B and C.

Analytical Approach

At the end of survey dissemination, raw response data was extracted from Qualtrics. For summary statistics of the sample and of close-ended responses, data were imported, cleaned, and analyzed using STATA. For open-ended responses, raw data were imported, cleaned, and coded in Excel. Due to the low response rate from Step-Down trainees (n=7), we could not conduct statistical tests to analyze differences between these groups. However, survey responses do provide descriptive summary that is useful for interpreting the qualitative findings from in-depth interviews. Throughout the report, survey and interview data are presented together, producing a more complete picture of TFET Phase III training efficacy.

Semi-structured Interviews

Sampling of Case Study Colleges and Participants

To further examine the quality of TFET Phase III training, we selected eight case study colleges. Our initial criteria included colleges that 1) specialized in Early Childhood (ECE) or General Education, and 2) where a Master trainee had carried out Step-Down training. From a list of 28 colleges that met our selection criteria, we aimed to select two colleges from each of the four mentoring universities. In the absence of any program monitoring data on Step-Down training in the colleges, we used responses to the online Master trainee survey to identify appropriate institutions to serve as case study colleges. Of the 33 Master trainees that completed the survey, *nine*[1] were located in a college specializing in ECE or General Education and reported Step-Down training on all modules at their college.

[1] Unfortunately, these colleges were not drawn from all four of the mentoring universities. We therefore called all individuals on the Master trainee list who were from colleges affiliated with the

From the list of nine Master trainee contacts, we recruited one Master trainee from eight different colleges. These eight trainees were interviewed by trained fieldworkers for about 45 minutes via telephone during the month of September 2021. Following each Master trainee interview, we asked participants to share contact details for the people they Step-Down trained. We sought to use these lists of Step-Down trainee contacts to recruit individuals with whom we could interview at the same eight case study colleges and to disseminate the online Step-Down survey. Unfortunately, two Master trainees were unable to provide these lists due to hospitalization and an unsuccessful Step-Down training experience[2]. We therefore conducted interviews with Step-Down trainees at only six of the eight case study colleges via telephone during October 2021.

Overall, our recruitment efforts produced a sample of eight Master trainees and six Step-Down trainees from eight varying colleges. The table below presents the case study sample for this study alongside university affiliation and college specialism. Seven of the eight colleges specialize in General Education, and one specializes in Early Childhood.

Table 2. Master Trainee Case Study Participants

University	Case Study College	Master Trainee	Step-Down Trainee	College Specialism
University of Development Studies, Tamale	1	1 (PDC)	1 (Tutor)	General
	2	2 (STSC)	N/A; Master trainee hospitalized	General
	3	3 (Tutor)	3 (Tutor)	General
University of Cape Coast	4	4 (PDC)	4 (Tutor)	General
University of Education, Winneba	5	5 (Tutor)	5 (Tutor)	General
	6	6 (Tutor)	6 (Tutor)	General
	7	7 (PDC)	7 (Tutor)	Early Childhood
University of Ghana, Accra	8	8 (Tutor)	N/A; Unsuccessful Step-Down	General

under-represented universities in an attempt to encourage them to complete the online survey. Despite these efforts, no further responses were received.

[2] We attempted to recruit two additional case study colleges from a list of 12 additional Master trainees who had not completed the online survey, but were at a college specialising in ECE or General affiliated to one of the two under-represented universities (University of Ghana and University of Cape Coast). Of those 12, three said they had not yet held Step-Down training, four were no longer at the college, and five did not respond.

Two of the eight colleges are located within the Brong Ahafo region and two are in Upper East. The remaining four colleges are located in the Western, Ashanti, Eastern, and Northern regions.

Semi-structured Interview Design

Using a variety of vignettes and scales, semi-structured interviews probed Master and Step-Down trainees' understanding of pupil-centered concepts and how program techniques promote learning. Earlier Phase II research showed that training participants were generally prepared to impart many of the easier spatial and material changes to teaching (e.g. student grouping, display of materials, etc.). We therefore designed the interviews to purposefully examine participants' theories of how children learn and what makes particular teaching techniques effective or not effective.

Interviews also focused on the perspectives of participants as *trainees* and as *trainers*. We sought details on Step-Down training coverage, approaches, challenges, and usefulness to others. The semi-structured interviews explored the distance between participants' prior understanding of pedagogy (their self-reported teaching style before the training) and pupil-centered approaches received from TFET training. Finally, participants were asked about the old and new teacher education curricula and ways to best support newly trained teachers to use pupil-centered techniques in basic schools. The complete Master and Step-Down Trainee interview tools can be found in Appendices D and E.

Analytical Approach

Closed-ended interview data was extracted into excel for quantitative analyses, while open-ended responses to questions were transcribed and coded thematically using Dedoose, a qualitative analysis software. A conceptual framework was designed to structure the data into three main categories. These were 1) the quality of TFET Phase III training, 2) impact, uptake, and understandings of pupil-centered pedagogy, and 3) implementation of the old 3-year diploma and new Bachelor of Education curriculum in the colleges. Across the 14 interviews, we looked for similarities and differences amongst the case study colleges and between Master and Step-Down trainee remarks.

Using a mixed methods approach, the interview and survey data were first analyzed separately and then interpreted together during the evaluation stage of analysis. Comparing both forms of data produced a more complete understanding of TFET training quality within the context of broader curriculum reform.

The sections that follow present the study's findings. Section 3 examines effectiveness of the TFET Phase III Master and Step-Down training. Section 4 assesses the presence of pupil-centered techniques within the colleges. Finally, Section 5 presents evidence on curriculum

reform and potential ways TFET may support the adoption of pupil-centered pedagogy within colleges and basic schools in Ghana.

TFET Phase III Training

The TFET Phase III Master training consisted of 10 sessions held online from 12 October to 27 November 2020 by the Sesame Square team. Master trainees were the PDCs and STSCs from the 46 Colleges of Education. There were also 18 Virtual Learning Trouble-shooters that attended the course. The first level of Step-Down with college tutors began the week of 11 January 2021 and was expected to mirror the Master training sessions held by Sesame Square. The PDCs were expected to use the 14 TFET YouTube videos and newly revised training manual during their professional development meetings. At the second level of Step-Down, college tutors were expected to integrate TFET into their courses with student teachers studying under the new Bachelor of Education curriculum on campus. Student teachers were also expected to receive TFET from STSCs during their practicum work in schools for one day a week. Rather than mirroring the master training, college tutors and STSCs were expected to incorporate TFET content into the general training and mentoring of students.

This section examines the effectiveness of TFET Phase III Master and Step-Down training by drawing on survey and interview data with program participants. We first explore distinguishing features of TFET, or what makes TFET different from other pupil-centered workshops that support the newly revised curriculum. Next, we examine the experiences of trainees during TFET training, including their confidence to train others. Finally, we describe how each level of Step-Down training was carried out with college tutors and student teachers and highlight the main successes and challenges.

Distinguishing Characteristics of TFET

Without prompting, interview data revealed at least six participants participated in prior trainings on pupil-centered instruction. In particular, the Transforming Teaching, Education, and Learning Project in partnership with mentoring universities supported the professional development of PDCs, STSCs, and tutors through other kinds of workshops and trainings. Thus, it is most likely that the 14 interview respondents had participated in other kinds of pupil-centered trainings before TFET. Although participants were not explicitly asked how TFET differed from other programs, the data indicated several ways TFET enhanced or complemented on-going reform efforts to curricula in the colleges.

Across interviews, TFET is generally seen as complementary to the on-going work that colleges are taking up to reform teacher education. Participants explained the program "enhanced" current understandings of pupil-centered teaching, "reminded" them of

techniques, "complimented" the active learning methods they already use, and offered a kind of "checklist" or "guide" to keep their pedagogy "on track." Promoting a pupil-friendly, inclusive learning environment and incorporating student grouping and discussions were cited by participants as the main similarities between TFET and other constructivist program content. Master trainee 1, a PDC, explained:

> I have had several workshops and courses similar to what you have done by T-Tel and other agencies and so inclusive learning, making sure everybody was on board and all that was something I did not play with but I must say that your workshop was a very good reminder, it was more detailed and I believe it helped me to interact even more with my students.

On the other hand, interviews revealed several characteristics that distinguish TFET from other pupil-centered trainings that potentially contribute new pedagogical knowledge. Two master trainees and two Step-Down trainees explained that TFET techniques were innovative and offered insight into the latest pedagogical trends. MT 6 explained:

> [TFET training] came at the appropriate time and it also helped us to also stay focused and it also taught us that we can make our lessons very fun, very interactive and still achieve the learning outcomes. We can also make our classroom environment a very conducive place so that all our learners will feel at ease when even coming to class because they might have their individual differences, individual problems but we should make sure that our classroom is always conducive for them to learn new things, get new ideas and flourish and grow.

According to MT 2, the unique early grades focus helped develop their confidence in supporting college tutors that specialize in Early Childhood Education. Positive discipline, developing low-cost teaching and learning materials, creating an inclusive classroom for students with disabilities, and the importance of lesson preparation stood out to participants as content unique to the TFET program. During interviews, TFET was described as "more detailed" than other trainings and offered instructional notes that were helpful for "facilitating" learning.

TFET Trainee Experience

Interviews and surveys sought to explore two complementary perspectives on training, that is, participant experience as a *trainee* and as a *trainer.* This sub-section reports on the former, drawing from data on master trainees' experience during the master training conducted by Sesame Square and on Step-Down trainees' experience as participants of the first level of Step-Down.

Preparation to Train Others

The online survey assessed the extent to which Master and Step-Down trainees felt confident to train or teach others to use seven techniques covered in the TFET Phase III program.

Responses were scored on a scale from 1-4, with 1 corresponding to 'Not Confident' and 4 corresponding to 'Very Confident'. The table below presents the data on trainee confidence. No respondents said they were 'Not confident' to teach a part of the program.

Table 3: Confidence to Train Others in TFET Phase III Techniques

How well prepared or confident do you feel to train other teachers to:	Very Confident	Somewhat Confident	A little Confident	Total (n=40)
Incorporate pupils' ideas questions and experiences into lessons	34 85%	6 15%	0 -	**40** **100%**
Have pupils work together in small groups	39 97.5%	1 2.5%	0 -	**40** **100%**
Teach with creative low-cost resources	33 82.5%	6 15%	1 2.5%	**40** **100%**
Support positive pupil behavior in their classroom	34 85%	5 12.5%	1 2.5%	**40** **100%**
Create interactive hands-on activities for pupils to explore new ideas	33 82.5%	7 17.5%	0 -	**40** **100%**
Use a variety of strategies activities and assessment during a lesson	35 87.5%	5 12.5%	0 -	**40** **100%**
Make accommodation for pupils with special learning needs	28 70%	11 27.5%	1 2.5%	**40** **100%**

Generally, trainees felt confident teaching other teachers to use TFET approaches. Trainees felt most confident to train other teachers to use pupil grouping. Interview data helps explain this finding, which showed that most trainees identified pupil grouping as a central feature of pupil-centered teaching because its supports cooperative learning, or pupils learning from one another. Interview data also showed trainees were grouping pupils prior to receiving the TFET training. The table above also shows that trainees felt least confident with training on accommodations for pupils with special needs, although most respondents (70%) still reported that they were very confident. Confidence to impart pupil-centered pedagogy likely stems from trainees' prior knowledge and experience with using TFET-style techniques.

Across the 14 interviews, 10 training participants reported feeling "well prepared" to train others at their college after the training ended. Of those 10, five were master trainees (PDCs, STSCs, and tutors), and five were Step-Down trainees (college tutors). The TFET YouTube

videos and training manual were cited most frequently as useful materials for learning. MT 2 stressed the usefulness of pictures and videos throughout the training:

> They helped us to actually understand the concept that we are going through very well. For example, we look at some of the things like assessment, video assessment and you see that feedback of assessment given to even parents, sometimes inviting the parents to come is a good thing that has helped the concept of the assessment… and then the way learners learn through play, we have a video to that effect and that is helping us. Even in mathematics, going out to, advising learners to jump has done well for our methodology classroom

Two respondents also emphasized the effectiveness of TFET's training approach, especially the use of grouping to facilitate participant learning.

In contrast, one Step-Down trainee and three master trainees reported feeling less prepared to train others after the training ended. The virtual nature of the training and TFET's similarity to how tutors currently teach were the main reasons given. Moreover, seven of the eight master trainees explained that poor network connection and virtual learning were major challenges to their training experience. According to MT 7, "Next time they shouldn't organize virtual training for the master trainers, it is not effective…they only gave us about GHS 20 for data and meanwhile it is cost ineffective." MT 8 agreed: "I will say [I was partly prepared] because this particular training was done via Zoom and it was due to the situation, it was COVID era, but it could have been more effective if it was done face to face." These remarks indicate a broader challenge across the Colleges of Education and basic schooling system in Ghana with network reliability and access. Accessing online resources for TFET training and classroom teaching was the most commonly cited challenge for student teachers.

TFET Trainer Experience

Drawing on survey and interview data, this section describes how Step-Down training was carried out by PDCs, STSCs, and college tutors at each level of the cascade model. In the following discussion of training participants, coverage, duration, and approaches, we highlight the main successes and challenges experienced by trainers as well as similarities and differences between the two levels of Step-Down training with college tutors and student teachers.

Step-Down Training Participants

Interview data revealed several characteristics of training participants, including the number of people trained as well as their primary role and area of specialization.

Step-Down Training Level 1

During the first level of Step-Down with college tutors, the number of training participants ranged from 18 to 35. On average, Master trainees taught the TFET program to 26 participants who varied by role and area of specialization. The table below summarizes how training participants varied across the eight case study colleges. Where '+' indicates the presence of specific roles, '-' denotes their absence from the training.

Table 4. Step-Down Training Level 1 Participant Roles Across the Case Study Colleges

Case Study Colleges	Professional Development Coordinators	Virtual Learning Troubleshooters	Supported Teaching in Schools Coordinators	College Tutors	Other Admin or Non-teaching Staff
1	+	-	+	+	+
2	+	-	+	+	-
3	-	-	-	+	+
4	+	-	+	+	-
5	+	+	-	+	-
6	+	+	+	+	+
7	-	-	+	+	+
8	+	-	-	+	-
TOTAL	**6**	**2**	**5**	**8**	**4**

Across the case study colleges, all Master trainees reported teaching college tutors during the Step-Down training. Most trainees also taught PDCs and about half taught STSCs and other administrative or non-teaching staff. At two colleges Virtual Learning Troubleshooters participated in the training.

Although TFET was designed to support the pedagogy of Early Childhood educators, the specialisms of participants varied widely. At seven of the eight case study colleges, Master trainees reported training individuals from at least six different backgrounds or specialisms. At five of the eight colleges, Step-Down training participants specialized in Early Childhood Education. At six colleges, participants also had a background in Education and Professional Development, and at seven colleges participants specialized in Math and ICT, Social Sciences, Vocational and/or Technical studies, Science Education, and Languages. One Master trainee did not report on the academic specialisms of training participants.

Step-Down Training Level 2

Interview data showed that the number of student teachers taught by the six Step-Down trainees varied widely from 17 to 1,058 in total. Three of the Step-Down trainees reported teaching between 300 – 550 students. Data on student cohort level showed that two of the six trainees taught one cohort of students (level 100 and level 200 respectively). Two trainees

taught two different cohorts of students (level 200/300 and level 100/200 respectively), and two trainees did not report which cohorts they taught. During interviews, tutors were asked whether they taught and/or supported student teachers in several areas of specialization. This data provided an indication of the backgrounds or programs of study for student teachers that received TFET. Table 4 summarizes these specialisms across six of the eight case study colleges. Where '+' indicates the presence of teaching students within a specialized program, '-' denotes the absence.

Table 5. Step-Down Training Level 2 Participant Specialisms Across Case Study Colleges

Case Study Colleges	Early Childhood and/or Primary Education	Math and ICT	Social Sciences	Education and Professional Development	Vocational and/or Technical	Science Education	Languages	Other
1	+	+	+	+	+	+	+	+
3	+	-	-	+	-	-	+	+
4	-	+	+	+	+	+	+	-
5	+	-	+	-	-	+	+	-
6	+	-	-	-	-	-	-	+
7	+	-	-	-	-	+	-	-
TOTAL	**5**	**2**	**3**	**3**	**2**	**4**	**4**	**3**

Of the six Step-Down trainees interviewed, five reported teaching students within the Early Childhood and/or Primary Education program. 'Colleges that specialize in Early Childhood' was a selection criterion for the eight case study colleges in this study. Four taught science and/or language courses and three taught within the Social Sciences and Professional Development programs.

Overall, interview data on Step-Down training participants indicates that TFET training was offered to a wide variety of faculty, staff, and student teachers at the eight case study colleges with specialisms outside Early Childhood Education to which program content is geared. Alignment between program design (especially what content is taught) and training participants (who receives the content) should be considered during future program design.

Coverage

The 40 responses to the online survey provide some indication of which modules were taught across 22 unique Colleges of Education. Findings from this data are summarized in the table below.

Table 6. TFET Phase III Training Coverage by Master and Step-Down Trainees

Which of the following modules have you taught or stepped down to others in your college?	Freq.	Percent
Module 1. Fundamentals of teaching and lesson planning	28	70
Master Trainee	24	72.7
Step-Down	4	57.1
Module 2. Developing a child-friendly classroom	30	75
Master Trainee	25	75.8
Step-Down	5	71.4
Other TFET modules	19	47.5
Master Trainee	19	57.6
Step-Down	0	0
None. I have not taught the TFET techniques to anyone else	5	12.5
Master Trainee	3	9.1
Step-Down	2	28.6

Of the 40 survey respondents, most had taught Modules 1 and 2 to others in their college (70% and 75% respectively). More than half of the 33 Master trainees had also taught other TFET modules while none of the 7 Step-Down trainee respondents reported doing so. Across the 40 respondents, 12.5% said they had not taught the TFET techniques to anyone else yet.

During interviews with eight Master and six Step-Down trainees, we sought additional information on training coverage based on the contents of the revised TFET Phase III training manual. The following table summarizes training coverage reported by participants module by module.

Table 7. Master and Step-Down Trainer Coverage of TFET Program Modules

TFET Phase III Program Modules Taught by Trainees to Others	Master trainees (n=8)	Step-Down trainees (n=6)	All trainees (n=14)
Module 1. Fundamentals of teaching and lesson planning	100%	83%	92%
Module 2. Developing a child-friendly classroom	100%	100%	100%
Module 3. Positive Discipline and Classroom Management	88%	83%	86%
Module 4. Developing and Teaching with Creative Low-cost Materials	100%	100%	100%
Module 7. Time Management	63%	67%	65%
Module 8. Practical Ways to Make the Classroom Creative and Fun	63%	83%	73%
Module 9. Differentiated Instruction	25%	67%	46%
Module 10. Evaluation and Assessment	50%	33%	42%
Module 11 Girls Education and Inclusion in the Classroom	25%	50%	38%
Module 12. Ensuring an Inclusive Learning Environment	50%	50%	50%

Module 13. Early Education and Childhood Development	13%	33%	23%
Module 14. Learning through Play	63%	50%	57%

All Master and Step-Down trainees reported teaching Module 2 on developing a child-friendly classroom and Module 4 on low-cost materials. Both modules were also reported as the most useful content from survey and interview data. This suggests trainers may prioritize TFET content coverage during Step-Down training by its relevancy or usefulness to participants. In contrast, Module 13 on early childhood education and Module 11 on girls education and inclusion were taught the least by 23% and 38% of trainees respectively. About half of Master trainees and a third of Step-Down trainees reported teaching Module 10 on assessment. According to Step-Down trainee 2, they did not cover Module 10 with student teachers because, "it is different from what the national teacher education assessment policy is."

Interview data also showed that trainer coverage ranged from five modules to 12 modules. Table 8 summarizes these findings by sub-group.

Table 8. Number of Modules Taught to Others during Step-Down Training

Number of TFET modules taught to others during Step-Down training	Master trainees	Step-Down trainees	All trainees
5 – 6 modules	4	2	6
7 – 8 modules	2	1	3
More than 9 modules	2	3	5

Of the 14 trainees we interviewed, six reported teaching five or six modules during the Step-Down training, three covered seven or eight modules, and five trainees covered more than nine. Only one Master trainee reported teaching all 12 TFET modules. Overall, findings indicate that module coverage varied significantly across trainers with an emphasis on covering the most useful modules for participants in the colleges.

Duration

Significant variation emerged from interview data across the eight case study colleges on when training occurred and how long it lasted. After the Master training ended on 27 November 2020, Master trainees carried out the first level of Step-Down at their respective colleges as part of an existing weekly professional development program. Master trainee responses to *when* Step-Down training occurred indicated a relatively wide timeframe spanning February to August 2021 (between two and eight months after Master training ended). Seven of the eight Master trainees reported training others once a week, and four of those seven reported training over a three-month period. Another two trained between 2-4 hours per week over one month.

One third of Step-Down trainees reported teaching TFET techniques to student teachers during courses *more than* once a week, and two-thirds taught just once per week. Step-Down trainee 1 explained: "In fact, after the training, you will see it is almost part of your teaching style so mostly anytime I am in the class, I try." Interview data suggests Step-Down trainees embedded techniques into their courses each week after they received training. How techniques were embedded is discussed in the section below on training pedagogy.

Trainer Pedagogy

Interview data revealed *how* trainers stepped down TFET techniques to college tutors and to student teachers. In particular, we examined what materials were used to train, whether the trainer modeled pupil-centered techniques during training, and general teaching approaches. Findings provide a descriptive account of training pedagogy, which varied between the eight case study colleges. Although self-reported teaching approaches are a limited measure of pedagogic quality, remarks do provide insight into what trainees think effective and/or pupil-centered teaching looks like in practice.

Use of Materials

Four Master and two Step-Down trainees reported using the TFET YouTube videos to present module content to participants. Videos laid the foundation for group discussion and were paused occasionally so that trainees could reflect and discuss observations. Step-Down trainee 1 explained: "During the video you pause at some point and ask them what is good about the way the teacher is teaching. If they have comments on it, in that case, you try to bring their mind on the way the teacher is trying to impact or teach in a child-centered manner." Several trainees also used the training manual, TFET images, PowerPoint slides, and other YouTube videos as training materials. For instance, Master trainee 4 described using training manual images to teach the difference between a pupil-centered and teacher-centered classroom.

Modeling TFET Techniques

When asked whether any TFET techniques were used while training, each of the 14 trainees reported to model at least one kind of pupil-centered technique. Seven Master and four Step-Down trainees reported grouping participants in different ways, including by ability, by mixing ability, and by department (e.g. mathematics, science, etc.). In this study, survey respondents also felt most confident teaching others to group pupils, and grouping emerged as central to how most trainees defined the concept of pupil-centered teaching. Facilitating whole and paired discussions (e.g. think, pair share), giving participants opportunities to contribute their own ideas to the lesson, and presenting content were also commonly reported as pupil-centered strategies by Master and Step-Down trainees. Other less frequently reported techniques included students' exploration of materials, accepting all answers to a question,

song and role play, giving feedback to students on their learning, and using low-cost teaching and learning materials.

Other Teaching Approaches

Trainee remarks on general training approaches revealed several patterns across the case study colleges. First, seven Master trainees and one Step-Down trainee reported co-teaching program techniques with other faculty in their college. At several colleges, PDCs typically co-taught other professional development sessions with another PDC in the college, so stepping down TFET followed suit. In other cases, trainees sought out the expertise of a colleague to cover particular program content. Master trainee 6 invited two "assessment measurement and evaluation" experts to review relevant module material and assist during Step-Down training: "They were quite versatile and quite knowledgeable in that particular field…their knowledge really helped." Master trainee 3, who specializes in language and literacy, invited a mathematics expert to demonstrate program techniques: "We began the learning with a song; it was a hands-on activity that we demonstrated in the class."

Across interview data, Master and Step-Down trainees described a similar training approach that involved a combination of participant grouping, engaging with videos and other materials, and discussing pupil-centered teaching in small and whole class groupings. These strategies mirror how trainees' conceptualized pupil-centered teaching during interviews, discussed in the next section. Five trainees reported replicating the style of training that they had received on TFET. In contrast, a few trainees shared unique training approaches. These were selecting and teaching "things that will be grasped easily," integrating or "joining" content between modules, and making connections between TFET and the BEd program content. Master trainee 5, a college tutor, explained how they embedded the techniques into courses with student teachers: "Mostly when you go to the classroom to present your lesson, you relate it to what you learnt from the program you also went through so that you won't go out of context."

Challenging Content to Teach

When asked whether any topics or modules were difficult to teach, two Master and two Step-Down trainees cited Module 4 on low-cost materials. Some participants found the concept of "low-cost" context-specific: "People think that what you think is low cost will also not be low cost for somebody, so they think that the low cost is challenging." Others explained that time and skills are needed to search for materials and to create something that will be of "effective quality." Master trainee 8 sought the support of other college tutors specializing in the Vocational studies to produce examples of self-made materials. Two Master and one Step-Down trainee also explained that positive discipline was hard for participants to understand or put into practice because of large class sizes and traditional understandings of discipline in Ghana.

Training Challenges

Master Trainees reported several challenges to stepping down techniques. The most frequently cited challenge was that trainings were too short. Master Trainees used their weekly professional development sessions to present the techniques, and six reported that this was not enough time to cover all the content in sufficient depth. Master Trainee 4 explained, "Timing is always a problem because there is not always enough time to do the activities." This challenge parallels findings from TFET Phase II research. Issues with poor network connectivity was also mentioned by five of the eight Master trainees. For example, Master Trainee 6 sent video links to tutors ahead of the training to save time, but found that they needed to play the videos during the training time anyway because participants were not able to watch them due to network access issues.

Challenges with network connection produced a secondary challenge with access to training materials. Master Trainees 6 and 7 explained hard copies of TFET materials would make training easier. Master Trainee 8 reported not receiving TFET materials and trained others based on memory. Other reported challenges were the diverse specializations of training participants, which made it harder to teach program content, and inconsistent participation from tutors due to their heavy workloads. Master trainee 2 suggested that training "should be more related to the subject area rather than mixing or combining the teachers for all the subject areas." Finally, challenges mentioned by two or fewer respondents were not having enough physical space to train or time to prepare for the training. Master trainee 8 mentioned that they were never reimbursed for data that they bought for their training.

Overall, findings suggest Step-Down Trainees had more flexibility and resources to present TFET techniques since they embedded them into their weekly courses. Thus, they faced fewer challenges than Master Trainees. One challenge mentioned by three Step-Down Trainees was that large class sizes made training more difficult. Step-Down Trainee 3 explained, "If you really want the effectiveness of some of these techniques, the classroom size should be small; not as large as 100." Relatedly, two Step-Down trainees cited a lack of resources, such as physical space, chairs, and photocopies of the materials. Finally, one trainee expressed limited time for instruction on TFET because of the timing of exams.

Conclusions on Phase III TFET Training

Although training participants likely received some kind of pupil-centered training *before* receiving TFET, findings from this study suggest TFET Phase III training complemented the on-going work of colleges to reform teacher education and promote pupil-centered approaches. Unique to TFET are modules on the use of positive discipline and low-cost materials framed by an early grades focus. Although several trainees reported challenges with virtual learning during the Master training, most trainees reported feeling confident or well

prepared to teach others to use TFET approaches. Of the 40 survey respondents, most had taught the first few modules to others in their colleges, but 13% had not taught any modules at the time of the survey, indicating potential challenges to the cascade training model. Although Step-Down trainees reported fewer training challenges than Masters, trainers felt most challenged by a lack of instructional time to teach TFET techniques and by poor network connection, inhibiting access to the virtual TFET training materials.

Findings from the eight case study colleges revealed significant variation in how Step-Down training occurred with college tutors and student teachers, including how long it lasted, what content was covered, and which individuals were trained. Although TFET is geared toward early grade educators, Step-Down training was offered to a wide variety of faculty, staff, and students from different specialized programs. Findings also showed that some trainers prioritized the most relevant or useful content during Step-Down training, and in some cases, co-taught TFET with other college faculty. Overall, trainers reported a similar teaching approach reflecting several pupil-centered techniques, especially grouping, class discussion, and collaborative engagement with materials.

Pupil-centered Techniques

In this study we assessed the presence of pupil-centered techniques within the Colleges of Education in two main ways. First, from interview data we explored changes in self-reported teaching style and changes to how participants thought about teaching after the training. Second, through interviews and online surveys, we examined participants' theories of learning and understandings of pupil-centered concepts. Below we present key findings from this data.

Training Impact

Training Impact on Teaching Style

To gauge whether interview respondents perceived any impact of the training on their teaching, we asked trainees from the case study colleges to describe their teaching style before and after completing the TFET training. Although this is a self-reported (albeit limited) measure of training impact, findings do suggest how respondents *think about* their own teaching practice. Interviews probed for specific examples of techniques used. We then classified trainees' self-reported pedagogic style as mainly pupil-centered, mainly teacher-centered, or as hybrid (exhibiting elements of both styles). The table below presents how many participants reported using techniques reflecting each of the three styles.

Table 9. Trainee Self-reported Teaching Style

Trainee Self-reported Teaching Style	Before TFET Training (n=14)	After TFET Training (n=14)
Mainly pupil-centered (Pupils actively exploring, discussing, contributing ideas; teacher as facilitator; differentiated; inclusive)	7	12
Mainly teacher-centered (Teacher controls what is taught and how; lecturing; pupils listening and/or viewing content presented by teacher)	4	0
Hybrid (Mix of pupil and teacher-centered instruction)	3	2

Of the 14 trainees interviewed, 10 reported using at least some pupil-centered techniques before receiving TFET, and seven reported a mostly pupil-centered teaching style. For example, Master trainee 2 explained: "We would always start with our RPKs [review of prior knowledge] and it is always something that the child knows and so we do from the known to the unknown so always we elicit things from the children based on what we want to teach." Other examples of a pupil-centered style before TFET training were students discussing content, engaging with learning materials in groups, and presenting ideas to the class. In contrast, four participants reported mainly lecturing during courses, reflecting a more teacher-centered style of pedagogy. None of the respondents described their pedagogic style as mainly teacher-centered after receiving TFET, and all 14 respondents identified the use of at least some pupil-centered techniques. These findings suggest the program potentially impacted on the way trainees *thought about* teaching and learning.

During interviews we probed for any self-reported changes to how trainees thought about teaching and/or used program techniques *after* receiving the training. Overall, four topics emerged that impacted on the way trainees thought about teaching. These were creating a child-friendly environment, developing low-cost materials, classroom management, and learning through play. Participants felt empowered by the idea of using low-cost or recycled materials for lessons: "Prior to the program for example I didn't care much, if the college is not supplying then it is not there but you opened my eye such that now I am able to go a step further to get low-cost materials or sometimes no cost at all to do my teaching so I must say it was worth it." These remarks reflect the applicability of program content within the college context.

Uptake of Pupil-centered Techniques

Half of the 14 interview participants reported adopting techniques following the training that supported active learning in the classroom. Active learning, where students learn through discussing, manipulating, interacting, and experiencing content, is a central feature of pupil-

centered instruction. Trainees described using "activity-based" teaching where, according to Step-Down trainee 3: "learners will be given activities and then they will come out with their own ideas on it and then I will give them an assignment and they will come and present and then I will be the facilitator guiding them." Master trainee 6 described in detail a language lesson that drew on students' linguistic resources, exemplifying active learning techniques they received from the TFET training:

> We were supposed to learn what is a dialect and what is language, the differences. So I just provided 3 different people from 3 different backgrounds. First I invited an Akan, somebody who is an Akan, an Ashanti. And I invited a Fante, made the Fante to communicate with the Ashanti person, they were able to communicate effectively and I asked the [other students] to note what happened and then I called somebody who is from Akwapim background and I asked him to communicate with the Fante, this one should speak Fante, this one should speak the Akwapim and let the people understand each other perfectly. I then called somebody who is a northerner, I think she is a Kusasi girl or so and I asked her to communicate with somebody in Fante. She should speak the Kusasi so immediately she started speaking the Kusasi they all started laughing and the Fante girl said she couldn't understand anything and I said ah. Then I told them when the Ashanti lady spoke, the Akwapim lady spoke, the Fante lady spoke and they understood…these three languages spoken are not languages; they are rather dialects. When the Kusasi lady spoke and the Fante girl couldn't understand, I also made him to speak to an Ewe and the Ewe too couldn't understand. I made the Ewe to also speak to an Ashanti guy and he couldn't also understand and I said they are rather languages. I was even surprised that I used that as an activity in the classroom and it made our lesson to be as simple.

This lesson exemplifies several TFET approaches, including the teacher as a facilitator of learning, student participation in whole class discussion, and role-play. In a similar way, Step-Down trainee 3 described how their students modeled pupil-centered techniques during a "micro-teaching activity," that is, when students practiced teaching their peers on campus: "They gave them cardboards…to introduce the lesson so that the students will come out and predict the topic through the pictures shown to the students, their colleagues."

Interview data also showed that developing low-cost materials and cooperative learning in groups were two program techniques taken up by several trainees after the training. Four master trainees explained how they used low-cost resources in their classes. Master trainee 5 reported, "I laminated and I used an old calendar to design a word card. I designed my teaching that the teacher shouldn't be having to go and use sophisticated items but you can just use the everyday items we have in our environment." Although some trainees reported grouping students during lessons *before* receiving TFET, they said the training enhanced or "refreshed" their grouping techniques. For example, Master trainee 6 said that using "mixed ability" groupings helped support cooperative learning where students felt comfortable sharing and learning from each other.

Usefulness of TFET Techniques

During the online survey, respondents were asked whether they found any program techniques to be useful to them in their teaching of adults (teaching college tutors or student teachers). Where trainees cited more than one technique, responses were double coded. The table below presents survey data on which TFET techniques were most useful to training participants.

Table 10. Useful TFET Techniques for Teaching Adults from Survey Data

TFET Techniques Useful for Teaching Adults	Step-Down trainees (n=7)	Master trainees (n=33)	All trainees (n=40)
Child Friendly Environment	0	5	5
Differentiated Strategies	0	4	4
Student Grouping	1	3	4
Inclusive Teaching	0	2	2
Low-Cost Teaching and Learning Materials	1	8	9
Positive Discipline	0	5	5
Time Management	0	4	4

Survey data showed significant variation across respondents, indicating seven different useful techniques for teaching other adults. About one quarter of respondents said the most useful content was Module 4 on developing low-cost teaching and learning materials. Interview data also revealed Module 4 content was a distinguishing characteristic of TFET. Other especially useful program techniques were creating a child-friendly environment, positive discipline, differentiated instruction, student grouping, and time management. In contrast, one Master trainee and two Step-Down trainees said they did *not* find any TFET techniques useful for teaching adults.

During interviews, trainees described the most useful parts of the TFET program for college tutors and/or student teachers. Across the 14 respondents, two techniques were cited most frequently. Creating a more student-friendly environment was identified as the most useful part of the training by five master and two Step-Down trainees. Trainees explained the module supports positive relationships or "connections" with students that are "welcoming," "comfortable," and "supportive," rather than "intimidating." Developing low-cost resources was also cited as most useful by six trainees. One of the most common challenges reported by trainees is a lack of basic school resources for student teachers. For trainees, this module presented a potential solution where they can innovate or create "durable," "long-lasting materials" (e.g. by laminating) at little to no cost by using materials from their local environment (e.g. from the market).

Conceptual Understandings of Pupil-centered Pedagogy

This study assessed how PDCs, STSCs, and college tutors *understand* the central tenants of pupil-centered pedagogy as presented within the TFET program. In the sections below we present survey and interview data that reveals trainees' theories of learning and understanding of central TFET content. We assessed topics that pertained to a wide variety of specialisms and grade levels due to the mixed backgrounds of training participants in the colleges.

Constructivist Orientation: "From the Known to the Unknown"

Constructivism is a dominant learning theory in the field of education comprised of various approaches that assume knowledge is actively constructed by the learner. Central to this theory is that new knowledge builds upon existing knowledge and experience. This process is often coined the 'activation' of prior knowledge. Because constructivist (or learner-centered) theory underpins the design of TFET as well as the recent reforms to curricula in Ghana, we assessed trainees' orientation to constructivist theories of learning.

Interview data showed that all respondents agreed with the following statement: "Pupils learn better when lessons build on their experiences at home and in the community." This statement reflects a central principle of constructivist theory. As participants explained their reasoning on the construction of knowledge, eight trainees expressed a common phrase that learning builds "from the known to the unknown." Master trainee 1 explained:

> You should always build from known to unknown and so when you try to develop a lesson from their previous or current experiences, already the student has some ideas on which you are going to build your lesson and so it becomes very easy for them to grasp whatever concepts you are going to give to them.

Building on a pupil's prior knowledge and experience during lessons emerged from participants remarks as a central theme in this study and an effective technique for learning.

We also assessed trainees' orientation to pupil-centered pedagogy in the online survey by measuring their level of agreement with statements from the TFET program. Table 9 summarizes survey respondents' level of agreement with five statements consistent with principles of pupil-centered pedagogy. Responses were scored on a scale of 1-5, with 1 corresponding to 'Strongly disagree' and 5 corresponding to 'Strongly agree'.

Table 11. Survey Respondent Level of Agreement with Positive Pupil-centered Statements

Positive pupil-centered Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Pupils learn better when they build on their experiences at home and in the community.	25 62.5%	11 27.5%	0 -	1 2.5%	3 7.5%	**40** **100%**
Independent learning activities help pupils discover answers to problems.	12 30%	13 32.5%	5 12.5%	7 17.5%	3 7.5%	**40** **100%**
There are many different ways for pupils to achieve the same learning objective.	34 85%	5 12.5%	0 -	0 -	1 2.5%	**40** **100%**
Pupils working together in small groups helps them learn from one another.	34 85%	5 12.5%	0 -	0 -	1 2.5%	**40** **100%**
Paying special attention to girls during a lesson can make learning more inclusive.	16 40%	6 15%	6 15%	8 20%	4 10%	**40** **100%**

All trainees agreed most with the statements, “There are many different ways for pupils to achieve the same learning objective,” and “Pupils working together in small groups helps them learn from one another.” For both statements 85% of respondents strongly agreed. These findings suggest a positive orientation or attitude toward differentiation and student grouping. “Paying special attention to girls during a lesson can make learning more inclusive” had the lower mean score, with 30% of respondents disagreeing or strongly disagreeing.” This statement reflects a central principle of TFET within modules 11 and 12 covering the concepts of *equity* and *equality*. To empower boys and girls equally in classrooms, teachers may need to treat girls differently (or equitably), especially since girls have not traditionally been in leadership roles or exposed to female role models. Similarly, one quarter of trainees disagreed that “Independent learning activities helps pupils discover answers to problems.”

Survey data also revealed trainees’ level of agreement with negative statements, or those that conflict with pupil-centered teaching. Responses were scored on a scale of 1-5, with 1 corresponding to 'Strongly agree' and 5 corresponding to 'Strongly disagree'.

Table 12. Survey Respondent Level of Agreement with Negative Pupil-centered Statements

Negative Pupil-centered Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
The more senses pupils use during a lesson the less information they will remember.	8 20%	0 -	0 -	6 15%	26 65%	**40** **100%**
Having fun and playing games are not effective ways for pupils to learn new skills	2 5%	0 -	0 -	6 15%	32 80%	**40** **100%**
Shouting at pupils for bad behavior is more effective than praising them for good behavior	0 -	0 -	0 -	12 30%	28 70%	**40** **100%**

All trainees disagreed or strongly disagreed with the statement "Shouting at pupils for bad behavior is more effective than praising them for good behavior." This finding contrasts with trainee remarks on positive discipline from interview data, suggesting the presence of survey respondent desirability bias. During interviews, three trainees reported positive discipline techniques as controversial and "detached" from Ghanaian culture. The statement, "Having fun and playing games are not effective ways for pupils to learn new skills" elicited the most "Strongly Disagree" responses (80%), although two trainees also strongly agreed. Finally, "the more senses pupils use during the lesson, the less information they will remember" had mixed responses. Twenty percent of respondents strongly agreed while 65% strongly disagreed.

In comparison, trainee interviews assessed the extent to which particular teaching techniques were viewed as effective. Responses were recorded on a scale from 0-3, with 0 corresponding to 'Not effective' and 3 corresponding to 'Very effective.'

Table 13. Interview Respondent Level of Teaching Technique Effectiveness

Teaching Techniques	Master trainees (n=8)	Step-Down trainees (n=6)	All trainees (n=14)
Storytelling by Teacher	1.88	2.33	2.10
Pupils Chanting or Reciting Material	0.75	1.00	0.88
Pupils Looking at Pictures of Concepts	1.88	2.17	2.02
Whole Class Discussion about a Topic	2.25	2.33	2.29
Pupils Working Together in Groups to Solve a Problem	3.00	2.83	2.92
Pupils Viewing a Demonstration by the Teacher	1.50	2.33	1.92
Pupils Listening to the Teacher Explain a Topic	1.00	0.83	0.92
Pupils Seeing Information Written on the Board	1.88	1.17	1.52
Pupils Acting Out of Dramatizing a Story or Concept	3.00	3.00	3.00

Findings show that Master and Step-Down trainees rated techniques with similar effectiveness scores. The technique rated most highly in its effectiveness by all trainees was "pupils acting out or dramatizing a story or concept." Rated second and third highest in effectiveness were "pupils working together in groups to solve a problem" and "whole class discussions about a topic." In contrast, "pupils chanting or reciting material," a traditional, teacher-centered method, was rated lowest in effectiveness with an average rating across the 14 trainees of 0.88 out of 4.

Overall, trainees espoused a more pupil-centered orientation to teaching and view several TFET-style techniques as effective for learning. The following section explores trainees' reasoning as to what makes these particular techniques more or less effective for learning.

Theories of Learning

Through in-depth interviews we explored trainees' theories of how children learn and the extent to which those theories espoused 'pupil-centered' approaches. When respondents gave examples of techniques they used in practice (e.g. student grouping), we asked how the use of that technique actually promoted learning. Findings revealed clear patterns in the way college faculty perceived pupil-centered approaches as more or less effective compared to teacher-centered or traditional pedagogy. In this study 'teacher-centered' is defined as the teacher controlling what is taught and how, mainly through lecturing in the college context.

All interview respondents cited at least one reason why pupil-centered teaching is effective. The table below summarizes the top four reasons given by study participants, supported with examples of trainee remarks to illustrate the reasoning.

Table 14. Theories of Pupil-centered Effectiveness from Interview Data

Reasons Why Pupil-centered Teaching is Effective	No. of Trainees (n=14)	Interview Data Extracts
Active learning: students actively engaging with materials, content, and ideas	14	*"When you are doing the activity directly, and when they do it themselves, it stays with them forever" (MT 1)* *"When they see and do, they will easily remember" (MT 3)* *"Dramatizing is more or less like you have understood it and it has become a part and parcel of you" (MT 4)*
Cooperative learning: students working and learning together, sharing ideas, and collaborating on tasks	14	*"When you put them into smaller groups, everybody is forced to also contribute" (SDT 1)* *"They feel okay to ask their colleagues if they don't know something" (SDT 3)* *"The talented ones and the gifted ones will be able to assist the weak ones to also be at par with them" (SDT 4)* *"They learn from their peers even more than from the teacher" (MT 7)*

Building on prior knowledge: using students prior knowledge and experience to teach new content ('known to unknown')	12	*"You teach from the known to the unknown, from the simple to the complex" (MT 4)* *"Link between the things that they see at home and what they have in school" (SDT 1)* *"Communities the students come from should not be isolated from the classroom" (SDT 5)* *"Even if the topic is new, every [pupil] has some previous knowledge on the topic" (MT 7)*
Student voice: students sharing their ideas, experiences, knowledge to enhance the quality of lessons	12	*"You don't walk into the classroom as if you have all the knowledge" (MT 1)* *"You let pupil's ideas be an important role" (MT 6)* *"Each learner is bringing his or her views and these learners learn at their level" (SDT 6)* *"[Students] hear from others and also pick up something" (MT 3)*

All respondents explained that pupil-centered techniques are effective because students actively engage with content and work cooperatively to learn from one another (e.g. small groups). These reasons were frequently linked to higher knowledge retention ("When they see and do, they will easily remember"). Reasons also reflected "pupil" as knowledgeable and the "teacher" as a facilitator to pupils acquiring new knowledge (rather than teacher as 'knower').

Twelve trainees explained that new learning is constructed when pupils build onto their existing knowledge and experience. Most respondents said incorporating student ideas and observations into lessons (e.g. through discussions) enhances the quality of teaching and learning. Supporting learning styles (e.g. visual, auditory, verbal) and social skills (e.g. accepting different viewpoints) emerged as secondary reasons for pupil-centered effectiveness. In contrast, a single reason was given for the *in*effectiveness of pupil-centered teaching by six trainees: extroverted students may "hijack" a discussion and assume control of the lesson while more introverted students remain silent and left out of the learning process.

Interview data showed teacher-centered pedagogy as mixed in effectiveness. Across all respondents, 10 trainees gave reasons why teacher-centered instruction was *not* effective. Low knowledge retention and the passive reception of new knowledge were the most frequently cited. For example, Master trainee 6 explained: "You recite your chant just for examination purposes and after exams, you tend to forget everything that you have learnt." On the other hand, seven respondents gave reasons why teacher-centered instruction *is* effective. Five trainees explained that a teacher is able to captivate students through storytelling or lecturing, which support students' listening skills. Three trainees said when teachers present information on the board, students take notes, which supports future referencing of the material.

Overall, interviews showed that PDCs, STSCs, and tutors hold a mostly constructivist, pupil-centered orientation to teaching but also value particular elements of traditional pedagogy, especially lecturing. The following sub-sections look more closely at the ways survey and interview respondents define the central ideas of the TFET program.

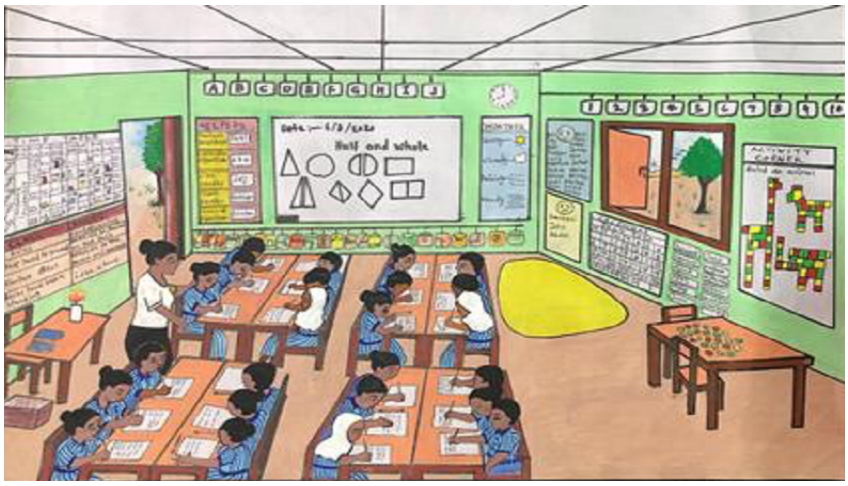
Pupil-centered Teaching

The TFET manual defines pupil-centered teaching as focusing on the needs, interests, abilities, and learning styles of pupils. Teachers guide pupils by engaging them in various activities, extend learning by asking questions, and encourage pupils to think and explore ideas. To assess retention of training content, we asked study participants to explain pupil-centered teaching in various ways.

Open-ended survey data from 40 respondents revealed three main ways trainees defined pupil-centered teaching. “Facilitating learning” was cited most frequently, followed by “involving students,” and “hands-on activities.” Across remarks, trainees defined pupil-centered teaching as pupils actively “exploring,” “experimenting,” “engaging,” and “discovering” knowledge and skills, where “learners possess control over what they learn.” The learner is “at the center” and “does everything” while the teacher “leads,” “directs,” and “guides” pupils to “find out information themselves.”

Survey respondents were also asked to identify one important thing that makes the classroom pictured in Figure 2 ‘child-friendly. The image was retrieved from the TFET Phase III training manual (p. 21) as an exemplary child-friendly classroom due to its displays, manipulatives, supportive teacher walking around to monitor pupils’ work, circle time area, relevant materials (such timetable and calendar), and because pupils are busy working in groups.

Figure 2. Exemplary Child-friendly Classroom from the TFET Phase III Training Manual



Survey data revealed three main features identified by respondents that make the classroom child friendly. Where respondents gave more than one reason, responses were double coded. Half of the 40 trainees said the spatial arrangements of furniture (e.g., seating) in the room supported a child-friendly learning environment. Just under half (45%) said that learning materials or pictures on the walls made the room child friendly. Finally, one quarter of respondents said the students working together in groups reflected child-friendly learning. These findings align with how a child-friendly classroom is presented in the TFET manual. Findings also reflect an emphasis on the spatial and material dimensions of the classroom.

During interviews, the 14 trainees were asked what advice they would give to a student teacher that wants to teach a pupil-centered lesson. Preparing and selecting relevant learning materials was the most frequently cited technique by 10 participants. Trainees explained that selecting materials before a lesson supports students' active engagement with content. Master trainee 1 added, "The teacher must ensure that most of the work is done by the students, [the teacher] will be there just as the facilitator." Across remarks, nine trainees mentioned the teacher should facilitate learning, and at least five said they would advise student teachers to plan out the lesson objectives, group students, review their prior knowledge, and integrate hands-on activities in ways that involve students in the learning process.

Interview data also revealed that trainees shared a common understanding of lesson sequencing: To 'facilitate' learning, the teacher should first organize students into small groups and provide learning materials for students to explore together. The teacher should move around the room, asking questions that elicit student ideas. Students should be talking more than the teacher. Finally, students present their own ideas to the class, while the teacher gives feedback and manages the discussion. This shared conception of pupil-centered teaching reflects several TFET approaches, especially student groups exploring and discovering ideas.

Instructional Differentiation

Differentiation is defined by TFET as teachers using a variety of teaching strategies, activities, and assessments during a single lesson to ensure all pupils achieve the same learning objective. It requires attending to students' preferred ways of learning, strengths, interests, and abilities. During the survey, respondents were presented with a vignette describing a vocabulary lesson where pupils create their own flashcards. Respondents were asked to identify one strategy to differentiate the lesson for students that struggle with writing. Table 13 presents responses from Master and Step-Down trainees and summarizes the frequency of reported techniques within the sample. Where responses included multiple techniques, those responses received more than one code.

Table 15. Differentiation Techniques for Supporting Pupils with Writing from Survey Data

Differentiated techniques to support pupils that struggle with writing	Number of Trainees (n=40)
Giving pupils different tasks or activities to the rest of the class	26
Organizing pupils into mixed or same ability groupings	8
Creating and providing vocabulary flash cards or alphabet cards for spelling	7
Pupils verbally explaining the meaning of the words	7
Pupils acting out the meaning of words through role play	4
Pupils copying down vocabulary words or letters from the board to practice writing skills	4
Giving students extended time, through afterschool remediation or during class	4
Pupils writing the words in the air or in the sand	3
Creating a vocabulary game to engage all pupils within the class	2
Pupils drawing pictures that represent the vocabulary words	2
Engage pupils in a reading activity	1
Assess students' writing abilities	1

Across the 40 responses, 26 trainees said they would give struggling writers a different task or activity to the rest of the class. The most frequently cited activities were pupils learning vocabulary using teacher-made flash cards and pupils verbally explaining the meaning of words. Nearly one quarter of respondents said they would group students either by ability and provide support to the lowest level group, or they would mix students by ability so the stronger writer can model and support the weaker writers.

Interview data revealed similar trainee understandings of differentiation. When asked what it means to differentiate instruction, nearly all participants defined the concept in one of three ways and characterized classrooms as "diverse" spaces. Seven trainees said differentiation means giving different tasks to different students based on learning level or ability. In some cases trainees explained that different tasks should be given to weaker students, while other remarks emphasized teaching to pupils' strengths. Six defined differentiation as attending to students' learning styles or preferences, such as auditory or visual learners, and five said it means mixing or using a variety of teaching approaches to support learning, such as extended time, additional guidance, and different explanations.

Although Module 9 on differentiation was only covered by a quarter of master trainees and two-thirds of Step-Down trainees, survey and interview data revealed that trainees understood how to use a wide variety of differentiation techniques that promote pupil-centered learning as presented within TFET. This conclusion may be explained by study participants' prior knowledge of differentiation covered with other workshops or programs of study prior to receiving TFET training. Findings also contrast with those from TFET Phase II

reporting, where classroom teachers found the concept of differentiation both useful and complex, which made it a more difficult technique to define and enact in practice.

Low-cost Teaching and Learning Materials

Across data gathered from TFET Phase II and III, trainees found Module 4 on developing low-cost materials especially useful, empowering, and distinctive from other pupil-centered workshops. The TFET Phase III manual defines creative, low-cost materials as those found in our immediate environment, such as beans, stones, and tree branches. Recycled materials such as bottles and newspaper, low-cost materials such as old clothing and beads, and the expertise of community members were presented in the manual as examples. In this study we asked the 40 survey respondents to name one low-cost resource they would use to teach a mathematics lesson and how they would use it in a lesson. The table below summarizes the resources named by the Master and Step-Down trainees.

Table 16. Low-cost Resources for Teaching Math from Survey Data

Low-cost resource to teach mathematics lesson on measurement	Step-Down trainees (n=7)	Master trainees (n=33)	All trainees (n=40)
Bottle Tops	1	14	15
Empty Containers	1	3	4
Paper/Pencil	1	4	5
Sticks/Stones/Nature	3	8	11
Other	1	4	5

Bottle tops (38%) and objects from nature (28%), such as sticks and stones, were most frequently named as low-cost resources for teaching math by survey respondents. Most trainees explained they would use those resources as counters for a lesson on addition and subtraction: “I will let the learners count a number of bottle tops separately and ask them to put them together.” Several trainees explained that sticks could be used to teach addition of whole numbers as well as place value. For teaching place value, a trainee explained, “single sticks are ones, a bundle of ten sticks are tens, and a bundle of tens are hundreds.” Remarks also explained that paper could be used to cut out shapes and to teach lines, angles, and polygons through folding. Pencils could be used as rulers for drawing lines. Four respondents identified empty milk tins for teaching volume and data representation, where children organize their tins according to day of birth. Across responses there was no mention of pupils gathering materials themselves or of community member expertise.

Overall, survey data suggests trainees understood several key messages from TFET Module 4. Responses showed trainees understood how low-cost teaching materials can be used to support pupils’ *conceptual* development in early grade numeracy, especially for number concept, place value, and data representation. However, findings on Step-Down training

discussed in Section 3 also showed that some trainees felt challenged by the time and skills required to effectively develop teaching materials themselves.

Classroom Management

TFET defines positive discipline as a system of classroom management that is respectful and encouraging that fosters positive behavior and relationships. Teachers are characterized as role models that support pupils' positive behavior through various measures, such as developing class rules together and signaling attention through clapping and singing. This study assessed survey respondents' understanding of positive discipline with a vignette drawn from the TFET Phase III training manual of pupils talking during a lesson and distracting others. When asked what is one thing you would do to promote positive discipline, survey data showed a wide variety of techniques. These are presented in Table 15 below.

Table 17. Discipline Techniques for Addressing Talkative Pupils from Survey Data

Discipline techniques for addressing talkative pupils during class	Step-Down trainees (n=7)	Master trainees (n=33)	All trainees (n=40)
Change Seating	0	8	8
Confront the Students	3	0	3
Engage in New Task	0	4	4
Investigate/Ask Why	0	6	6
Re-engage in Lesson	1	5	6
Remind of Classroom Rules	2	5	7
Other	1	5	6

Of the discipline techniques reported in Table 15, all survey respondents cited at least one positive technique and four trainees (10%) also made reference to a negative strategy. The most frequently mentioned positive technique was changing the talkative pupils' seating arrangement. Respondents either said they would separate students or move them to the front of the room to manage behavior more easily. Reminding pupils of class rules, asking students why they were talking, and re-engaging students by asking questions on the lesson topic were also frequently mentioned. Four master trainees said they would engage the talkative students in a new task, for example, by assigning them with a leadership role for managing class behavior. Three Step-Down trainees explained they would confront students by standing silently at their table or by mentioning their names. A few trainees said they would use the happy/sad faces chart, make students stand, take time away from break, and allow the talkative pupils to share their discussion with the class.

Overall, classroom management and positive discipline stood out to training participants as both a useful and distinctive module that most Master and Step-Down trainees taught to others in their college. However, interview data mirrored challenges to understanding observed during TFET Phase II. One Step-Down trainee and two Master trainees explained that training others to use positive discipline was "challenging," "controversial," and "detached from [Ghanaian] culture." College tutors "argued back and forth" about its effectiveness, citing large classrooms of students and traditional culture as the main obstacles. Findings from this study suggest that positive discipline is attractive to some, and relatively easier to enact, but continues to challenge traditional cultural norms of discipline in schooling contexts, especially when teaching large classes of students.

Conclusions on Pupil-centered Techniques

Study participants expressed a shared understanding of pupil-centered instruction that positions the teacher as a "facilitator" of learning who builds lessons on pupils' prior knowledge and experience. By engaging with materials and collaborating with peers, pupils "actively" discover knowledge. Most PDCs, STSCs, and tutors espoused a constructivist, pupil-centered orientation to teaching and viewed several TFET-style techniques as effective for learning, especially differentiated instruction, pupil grouping, and role-play. However, some college faculty continue to see lecturing as an effective method of instruction, especially for teaching large classes, and viewed positive discipline as contrary to traditional Ghanaian culture. On the other hand, trainees found the innovative approaches of Module 4 on low-cost materials as the most useful program content, especially for addressing a lack of teaching materials in basic schools. Trainees clearly understood how teaching materials could be used to support pupils' conceptual development, but some found it difficult to design materials in practice. Overall, findings suggest TFET potentially enhanced participants' existing repertoire of pupil-centered techniques that support active learning and innovation. As a result, TFET may impact on how trained participants *think about* their pedagogy and potentially, how they carry out instruction.

Teacher Education Reform in Ghana

The roll out of TFET Phase III is happening in the context of an overhaul to the national teacher education curriculum in Ghana that promotes similar principles of constructivist theory and pupil-centered pedagogy. Several criticisms of teacher preparation led to the recent curriculum reforms in Ghana. These included a dominance of traditional, teacher-centered pedagogy driven by examinations and variation in the quality of teachers across the system. This variation in teacher quality is partly due to a lack of common preparation programs and a variety of less-specialized pathways into the profession (Buabeng *et al*, 2020).

In 2014, the national government initiated the Transforming Teaching, Education, and Learning (T-TEL) project, funded by a UK-sponsored change program and managed by Cambridge Education to overhaul pre-service teacher training. The work of T-TEL alongside other government stakeholders and Colleges of Education led to the development of two new policies to set the minimum professional competencies within the profession. These are the National Teacher Education Curriculum Framework and the National Teachers' Standards. T-TEL also worked closely with the 46 Colleges of Education to improve tutor teaching capacity and use of interactive, 'student-focused' instruction (Cambridge Education, 2021).

As a result of national reform initiatives, several changes occurred starting in 2014. Ten additional Colleges of Education were added to the system under five mentoring universities. This change produced a total of 46 Colleges of Education nationally. Since October 2018, the colleges were upgraded to 4-year degree awarding institutions with the minimum entry requirement into teaching a Bachelors of Education degree (B.Ed.). As the colleges phased out the former 3-year Diploma in Basic Education, a new vision of teaching was introduced, "ensuring that teachers are confident in the use of learner-centered approaches, including ICT, to encourage critical thinking and problem solving" (Buabeng *et al*, 2020, p. 91). Central to implementing this new curricula are colleges' Professional Development Coordinators (PDCs), Supported Teaching in Schools Coordinators (STSCs), and tutors.

In this study, we sought the perspectives of PDCs, STSCs, and tutors as agents of curriculum reform. Findings revealed key differences between the old and new curricula and some of the most important challenges and strategies to successfully implement and support student use of pupil-centered approaches. This final section presents evidence on curriculum reform and points to potential ways TFET may further support the adoption of pupil-centered teaching across colleges and basic schools in Ghana.

Pupil-centered Pedagogy and the New Curriculum

During interviews, trainees were asked to describe how the new 4-year B.Ed. curriculum is different from old 3-year Diploma. Of the 14 respondents, 12 described the new curriculum as more pupil-centered compared to the old. Master trainee 7 said, "The 3-year [curriculum] was about content, content, but this [new curriculum] is about activity, activity, activity…it is the learners that do it." Step-Down trainee 1 explained how curriculum reform has impacted on the role of the teacher (or tutor):

> If you look at the new one, almost all the approaches are geared towards pupil-centered …You know previously when you write your lessons, the activities, they will say teacher ask learners to do this but now we are saying that don't even involve the teacher there. The teacher is now acting like a facilitator so learners do this; we want to hear the learners more than the activities of the teachers. Even though the teacher is behind the scene, we don't want to see you there; we want everything to be owned by the learners.

Participants described the new curriculum as more specialized than the old, for example, through new programs specializing in Early Childhood and Primary Education. More than half of trainees emphasized how the new B.Ed. program integrates content and pedagogy within its courses and provides students with more opportunities to practice teaching in the field.

In contrast, several study participants characterized the old 3-year curriculum as more content driven. Step-Down trainee 6 stated: "With the old one, we used to teach them content courses for the first and second year and then the last year, which is the third year, they are all for methodology, how to teach, but with this new [curriculum] the methodologies are mixed with the content." These remarks suggest the new curriculum focuses on developing students' pedagogic content knowledge, or how to teach particular content or concepts in ways that enhance student learning. Under the old curriculum content and pedagogy were taught separately within distinct sets of courses. Trainees reported this distinction between content and pedagogy produced an exam-driven environment focused on pass rates and students' acquisition of content knowledge. Under the new curriculum, however, standardized exams remain a central feature. According to Master trainee 1:

> The examination centeredness is still there hunting us. For example, we are affiliated with [managing universities], we will set questions such that it is more of memorizing, introducing and so on and so forth and teachers are graded based on how many of your students are passing and all that and you know, pupil-centered lessons take time.

Master trainee 6 agreed that time for planning is a challenge and, because managing institutions set exam questions, it is difficult to design a pupil-centered curriculum without "penalizing" students "because they wouldn't be able to answer the end of term exams."

Supporting Student Teachers with Pupil-centered Techniques

Several Master and Step-Down trainees identified large class sizes as a challenge for student teachers using pupil-centered techniques, suggesting that class size undermines the efficacy of techniques or prevents their use entirely. Step-Down trainee 6 explained: "Whatever technique you have used, when you go and the class is large, there is no way you can use it; no matter what you do, you have to use the lecture method." Additionally, Master trainee 6 explained that classes with up to 60 or 75 pupils are more difficult to group, and it is challenging to give students individual attention or feedback. Positive discipline, creating a friendly environment, and learning through play were cited as especially challenging with large classes. Master Trainee 3 stated:

> "For positive discipline and classroom management […] the number of people in the [TFET] video were small, that is why probably those techniques that were used in controlling the

> class were effective. If it happens on our grounds where we have these large classes of about 40, 50 and all those things, those approaches may not be applicable in that circumstance."

Adapting pupil-centered techniques for larger classes may benefit college tutor *and* student teacher uptake of TFET as well as uptake of pedagogy espoused within the new B.Ed. curriculum. In addition to class size, five respondents explained that a lack of school-based resources makes using pupil-centered approaches harder, especially a lack of electricity, computers, Internet access, and desks, tables and chairs for grouping. These findings mirror those found in earlier Phase II reporting on uptake of TFET within the low-fee primary school context.

Student motivation also emerged across the remarks of four respondents as key to adopting pupil-centered teaching. Using TFET-style pedagogy takes more preparation time and effort than traditional teacher-centered approaches. When asked how students can be best supported to use pupil-centered techniques, Step-Down trainee 1 said, "Every new thing needs encouragement […] if you are not that type who has patience in the work, you may just ignore some salient points and just brush it over which is not good, so you need motivation, financially and everything." Understanding *why* pupil-centered instruction is favorable over more traditional methods may support students' motivation to teach in ways that are relatively different, more complex, and take longer to prepare.

Four Master and two Step-Down Trainees suggested that additional in-service training and mentoring would be helpful for student teachers. According to Master trainee 2, an STSC who works with students in schools, "When you get to the classroom and [student teachers] are doing their part, you have the opportunity to remind them of some of these things that they have done." Step-Down trainee 6 called for more training for tutors every semester. Two Master Trainees said college tutors need to be modeling pupil-centered techniques during courses to demonstrate their efficacy in practice. To implement student-centered lessons four trainees stressed the importance of giving sufficient teaching and learning materials to students, and another four emphasized the usefulness of Information and Communication Technology. Step-Down trainee 4 praised the ways student teachers use "ICT technology to acquire knowledge for themselves."

Conclusions on Teacher Education Reform in Ghana

The new B.Ed. curriculum differs from the old in several ways, especially its emphasis on activity-based learning and pupil-centered instruction. More specialized programs and courses under the new curriculum now integrate pedagogy with content knowledge. Under the old curriculum an exams-driven culture prioritized the acquisition of content knowledge. Despite these changes, tutors find it challenging to align the new activity-based methods with on-going standardized exams. For student teachers, a lack of access to print and virtual resources in basic schools challenges the uptake of pupil-centered techniques. While TFET

does present innovative techniques for developing low-cost teaching materials, other resources such as furniture and network equipment are relatively scarce. Strategies for adapting program techniques for large classes and on-going professional development for recently graduated students may enhance students' understanding and motivation to use pupil-centered approaches.

Conclusions

Findings from this study showed that TFET Phase III training supported the work of curriculum reform in the colleges of education. Trainees' backgrounds varied across a range of specialized areas. Although Master training was carried out virtually, and several trainees found its format challenging, most trainees reported feeling well prepared to train others on pupil-centered techniques at their college. The majority of study participants reported at least some Step-Down training happened at their college, but findings also showed Step-Down training had not happened at several colleges at the time of the survey (7-8 months after Master training occurred). Findings also showed that trainers were challenged by heavy workloads and a lack of instructional time. In addition, trainers were challenged by network connectivity, which restricted access to the digital TFET training materials (manuals and video).

All study participants reported using pupil-centered approaches prior to receiving TFET and generally understood the tenants of pupil-centered theory. As a result of this prior knowledge, the TFET program may enhance training participants' existing repertoire of pupil-centered techniques. Module 4 on low-cost materials stands out in this study (and in earlier Phase II reporting) as the most useful, empowering content that distinguishes TFET from other pupil-centered programs. Module 4 also addresses some of the resource challenges faced in local schooling contexts. As a result, all trainers covered Module 4 at the eight case study colleges. Findings also showed that trainers selected to cover the most relevant content during training sessions.

The reported pedagogy of PDCs, STSCs, and college tutors showed a mostly pupil-centered style with some use of lecturing. Study participants expressed similar teaching approaches reflecting the use of TFET-style techniques promoted in the new B.Ed. curriculum. Student grouping, class discussion, and exploring materials were especially prevalent strategies. As the colleges continue reforming the pedagogy of tutors and students through the new curriculum, TFET is both timely and well positioned to support the pedagogic needs of colleges. These needs include adapting pupil-centered instruction for large class sizes and motivating participants to adopt approaches that differ from traditional teacher-centered methods. As agents of curriculum reform, PDCs, STSCs, college tutors, and students may benefit from continued professional development focused on the most useful and relevant content for implementing the new curriculum.

Recommendations

The following program recommendations include four strategies for expanding the scope and quality of Step-Down training within the colleges of education.

- **Align TFET training content with its target audience**. The professional development needs of college faculty differ from the low-fee private primary schools for which TFET was originally designed. In addition, Phase III training participants specialized in several fields and levels of teacher preparation, including but not limited to Early Childhood Education.

- **Design an abbreviated TFET training program for Colleges of Education** that covers the most useful and relevant content for the higher education context and for college tutors to implement the new B.Ed. curriculum. The most frequently cited challenge to training quality was insufficient time to cover modules (mirroring challenges from Phase II). Step-Down training coverage varied widely across the colleges, and at several, Step-Down did not happen at all. Trainers reported a heavy workload with limited instructional time. Providing colleges with an abbreviated program focusing on a few useful topics may encourage colleges that have not yet stepped down techniques to do so within a more reasonable time frame.

- **Offer a refresher training to Master trainees**. Seven of the eight Master trainees explained that the poor network connection negatively impacted on the quality of their Master training experience. Refresher training might also encourage trainees to hold a Step-Down training where it has not yet occurred.

- **Provide hard copies of all program materials to training participants,** including PDCs, STSCs, and college tutors at the 46 colleges. Poor network access impacted on the quality of the Master training and both levels of Step-Down training. Hard copies of program materials may support on-going efforts to Step-Down techniques to other faculty and students within the colleges.

References

Buabeng, I., Ntow, F. D., and C. D. Otami (2020) Teacher Education in Ghana: Policies and Practices. *Journal of Curriculum and Teaching*, vol. 9, no. 1, pp. 86-95.

Cambridge Education (2021) Teaching in Ghana: Turning the Barrier into the Solution. *Transforming Teaching, Education, and Learning*. Retrived from: https://www.camb-ed.com/article/239/t-tel-ghana.

Appendices

Appendix A: Online Survey Respondent Background Statistics

Table 18. Online Survey Respondents by Region

	Freq.	Percent
Ashanti	6	15%
Brong Ahafo	3	8%
Central	3	8%
Eastern	4	10%
Northern	3	8%
Upper East	1	3%
Upper West	6	15%
Volta	7	18%
Western	5	13%
NA	2	5%
Total	40	100%

Table 19. Primary Role of Online Survey Respondents

	Master	Step-Down	**Total**
Professional Development Coordinator (PDC)	12	1	**13**
	36.36	14.29	**32.50**
Supported Teaching in Schools Coordinator	3	0	**3**
	9.09	0.00	**7.50**
Tutor	17	6	**23**
	51.52	85.71	**57.50**
Virtual Learning Troubleshooter	1	0	**1**
	3.03	0.00	**2.50**
Total	33	7	40
	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table 20. Academic Area of Specialization Reported by Online Survey Respondents

Area		Freq.	Percent
Early Childhood and/or Primary Education		**8**	**20**
	Master Trainees	6	18.2
	Step-Down Trainees	2	28.6
Math and ICT		**11**	**27.5**
	Master Trainees	9	27.3
	Step-Down Trainees	2	28.6
Social Science		**6**	**15**
	Master Trainees	5	15.2
	Step-Down Trainees	1	14.3
Education and Professional Development		**14**	**35**
	Master Trainees	14	42.4
	Step-Down Trainees	0	0
Vocational and/or Technical		**3**	**7.5**
	Master Trainees	3	9.1
	Step-Down Trainees	0	0
Science Education		**10**	**25**
	Master Trainees	9	27.3
	Step-Down Trainees	1	14.3
Language		**5**	**12.5**
	Master Trainees	4	12.1
	Step-Down Trainees	1	14.3

*This item was multi-select

Table 21. Early Grade Teaching Experience Reported by Online Survey Respondents

Grade		Freq.	Percent
KG1		**4**	**10**
	Master Trainees	2	6.1
	Step-Down Trainees	2	28.6
KG2		**6**	**15**
	Master Trainees	4	12.1
	Step-Down Trainees	2	28.6
KG3		**4**	**10**
	Master Trainees	3	9.1
	Step-Down Trainees	1	14.3
P1		**12**	**30**
	Master Trainees	8	24.2
	Step-Down Trainees	4	57.1

P2		**16**	**40**
	Master Trainees	12	36.4
	Step-Down Trainees	4	57.1
P3		**25**	**62.5**
	Master Trainees	20	60.6
	Step-Down Trainees	5	71.4

*This item was multi-select

Table 22. Highest Educational Qualification Reported by Online Survey Respondents

	Master	Step-Down	**Total**
Doctorate	1	0	**1**
	3.03	0.00	**2.50**
Masters Degree	31	7	**38**
	93.94	100.00	**95.00**
Post-secondary Certificate	1	0	**1**
	3.03	0.00	**2.50**
Total	33	7	**40**
	100.00	100.00	**100.00**

Appendix B: Master Trainee Online Survey Tool

Master Trainee Questionnaire RECORD NUMBER_____	TFET Techniques for Effective Teaching Sesame Workshop IDP Foundation, Inc. NORC @ the University of Chicago

Dear participant

We would greatly appreciate if you, a trainee in the TFET Master Training Programme, would take 15 minutes to fill out this questionnaire. The purpose of this questionnaire is to assist Sesame Workshop's TFET Program to better understand the effectiveness of the training approach. All personal information in this questionnaire will be kept confidential.

Date:	
Participant Name:	
College Name:	

CONFIDENTIALITY **Please sign below to indicate your consent to the confidentiality agreement**	I understand that my participation in this study is voluntary. I understand that I may refuse to answer any of the questions and that I may end the survey at any time. I understand that my decision to participate or end the survey will not in any way affect me or my college. I understand that this questionnaire and written record of my responses will be treated as confidential and neither my name nor any name referenced will be used in any written report.
SIGNATURE	

1. INFORMATION ABOUT YOU

1.1	What is your primary role at your college?	Tick appropriate line
A	Professional Development Coordinator	
B	Virtual Learning Troubleshooter	
C	Supported Teaching in Schools Coordinator	
D	Tutor	
E	Student teacher	
F	Other. Specify:	

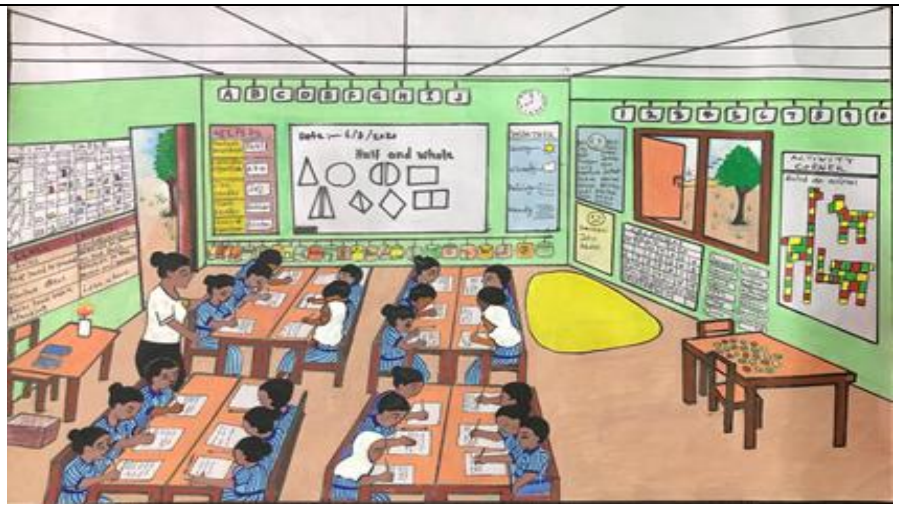
1.2	In your role at your college, do you teach and/or support student teachers in any of the following areas?	Yes	No
A	Early Childhood and/or Primary Education		
B	Math and ICT		
C	Social Sciences		
D	Education and Professional Development		
E	Vocational and/or Technical		
F	Science Education		
G	Languages		
H	Other. Specify:		

1.3	Do you have any experience teaching the following grades?	Yes	No
A	KG1		
B	KG2		
C	KG3		
D	P1		
E	P2		
F	P3		

1.4	What is the highest educational qualification you have completed?	Tick appropriate line
A	SSS/WASSCE (SHS)	
B	Post-secondary Certificate	
C	Diploma/HND	
D	Bachelors Degree	
E	Masters Degree	
F	Doctorate	
F	Other. Specify:	

1.5	What is the name of your college?
A	

2. TECHNIQUES FOR EFFECTIVE TEACHING

2.1	In the picture below, what is ONE important thing that makes this classroom CHILD-FRIENDLY?
	
A	

2.2	Imagine you are teaching a lesson and you hear two of your pupils talking loudly. You see they are not paying attention and are distracting other pupils in the class. What is ONE thing you would do to promote POSITIVE DISCIPLINE in your classroom?
A	

2.3	Name one LOW-COST RESOURCE you would use to teach a mathematics lesson on measurement. HOW would you use this resource in your lesson?
A	

2.4	Please choose which option best describes the TFET Master training program:	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
A	Pupils learn better when they build on their experiences at home and in the community					
B	The more senses pupils use during a lesson (hear, taste, see, touch, smell), the less information they will remember					
C	Independent learning activities help pupils discover answers to problems					
D	There are many different ways for pupils to achieve the same learning objective					
E	Having fun and playing games are not effective ways for pupils to learn new skills					
F	Pupils working together in small groups helps them learn from one another					
G	Shouting at pupils for bad behavior is more effective than praising them for good behavior					

H	Paying special attention to girls during a lesson can make learning more inclusive					

2.5	**In your view, what is PUPIL-CENTERED LEARNING?**
A	

2.6	**Imagine you are planning a reading lesson that teaches pupils new VOCABULARY from a text. Your pupils will create flash cards by writing each word and definition, but there are a few students in your class who struggle with writing. What is ONE strategy you would use to DIFFERENTIATE the lesson activity for those few students?**
A	

3. MASTER TRAINER EXPERIENCE

3.1	**Which of the following modules have you taught or stepped down to others in your college?**	**Yes**	**No**
A	Module 1. Fundamentals of teaching and lesson planning		
B	Module 2. Developing a child-friendly classroom		
C	Other TFET modules		
D	None. I have not taught the TFET techniques to anyone else		

3.2	**How well prepared or CONFIDENT do you feel to train other teachers to:**	**Not confident**	**A little confident**	**Somewhat confident**	**Very confident**
A	Incorporate pupils' ideas, questions, and experiences into lessons				
B	Have pupils work together in small groups				
C	Teach with creative low-cost resources				
D	Support positive pupil behavior in their classroom				
E	Create interactive, hands-on activities for pupils to explore new ideas				
F	Use a variety of strategies, activities, and assessments during a lesson				
G	Make accommodations for pupils with special learning needs				

3.3	**Sesame's TFET techniques were developed for young children in the early grades; however, these techniques may also be useful in other teaching situations. Have you found any of the TFET techniques to be useful to you in your teaching of adults?**	**Tick appropriate line**
A	Yes. Please specify which techniques:	
B	No.	

THANK YOU VERY MUCH FOR PARTICIPATING IN THIS QUESTIONNAIRE.

Appendix C: Step-Down Trainee Online Survey Tool

Step-down Trainee Questionnaire RECORD NUMBER_____	TFET Techniques for Effective Teaching Sesame Workshop IDP Foundation, Inc. NORC @ the University of Chicago

Dear participant

We would greatly appreciate if you, a trainee in the TFET Training Programme, would take 20 minutes to fill out this questionnaire. The purpose of this questionnaire is to assist Sesame Workshop's TFET Program to better understand the effectiveness of the training approach. All personal information in this questionnaire will be kept confidential.

Date:	
Participant Name:	
College Name:	

CONFIDENTIALITY **Please sign below to indicate your consent to the confidentiality agreement**	I understand that my participation in this study is voluntary. I understand that I may refuse to answer any of the questions and that I may end the survey at any time. I understand that my decision to participate or end the survey will not in any way affect me or my college. I understand that this questionnaire and written record of my responses will be treated as confidential and neither my name nor any name referenced will be used in any written report.
SIGNATURE	

1. INFORMATION ABOUT YOU

1.1	What is your primary role at your college?	Tick appropriate line
A	Professional Development Coordinator	
B	Virtual Learning Troubleshooter	
C	Supported Teaching in Schools Coordinator	
D	Tutor	
E	Student teacher	
F	Other. Specify:	

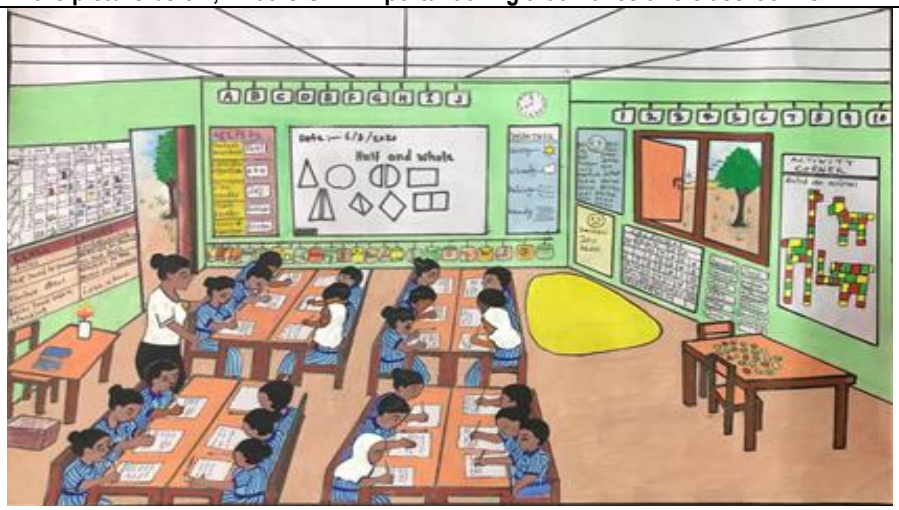
1.2	In your role at your college, do you teach and/or support student teachers in any of the following areas?	Yes	No
A	Early Childhood and/or Primary Education		
B	Math and ICT		
C	Social Sciences		
D	Education and Professional Development		
E	Vocational and/or Technical		
F	Science Education		
G	Languages		
H	Other. Specify:		

1.3	Do you have any experience teaching the following grades?	Yes	No
A	KG1		
B	KG2		
C	KG3		
D	P1		
E	P2		
F	P3		

1.4	What is the highest educational qualification you have completed?	Tick appropriate line
A	SSS/WASSCE (SHS)	
B	Post-secondary Certificate	
C	Diploma/HND	
D	Bachelors Degree	
E	Masters Degree	
F	Doctorate	
F	Other. Specify:	

1.5	What is the name of your college?
A	

2. TECHNIQUES FOR EFFECTIVE TEACHING

2.1	In the picture below, what is ONE important thing that makes this classroom CHILD-FRIENDLY?
	
A	

2.2	Imagine you are teaching a lesson and you hear two of your pupils talking loudly. You see they are not paying attention and are distracting other pupils in the class. What is ONE thing you would do to promote POSITIVE DISCIPLINE in your classroom?
A	

2.3	Name one LOW-COST RESOURCE you would use to teach a mathematics lesson on measurement. HOW would you use this resource in your lesson?
A	

2.4	Please choose which option best describes the TFET training program:	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
A	Pupils learn better when they build on their experiences at home and in the community					
B	The more senses pupils use during a lesson (hear, taste, see, touch, smell), the less information they will remember					
C	Independent learning activities help pupils discover answers to problems					
D	There are many different ways for pupils to achieve the same learning objective					
E	Having fun and playing games are not effective ways for pupils to learn new skills					
F	Pupils working together in small groups helps them learn from one another					
G	Shouting at pupils for bad behavior is more effective than praising them for good behavior					
H	Paying special attention to girls during a lesson can make learning more inclusive					

2.5	In your view, what is PUPIL-CENTERED LEARNING?
A	

2.6	Imagine you are planning a reading lesson that teaches pupils new VOCABULARY from a text. Your pupils will create flash cards by writing each word and definition, but there are a few students in your class who struggle with writing. What is ONE strategy you would use to DIFFERENTIATE the lesson activity for those few students?
A	

3. STEP-DOWN TRAINER EXPERIENCE

3.1	Which of the following modules have you taught or stepped down to others in your college?	Yes	No
A	Module 1. Fundamentals of teaching and lesson planning		
B	Module 2. Developing a child-friendly classroom		
C	Other TFET modules		
D	None. I have not taught the TFET techniques to anyone else		

3.2	How well prepared or CONFIDENT do you feel to train other teachers to:	Not confident	A little confident	Somewhat confident	Very confident
A	Incorporate pupils' ideas, questions, and experiences into lessons				
B	Have pupils work together in small groups				
C	Teach with creative low-cost resources				
D	Support positive pupil behavior in their classroom				
E	Create interactive, hands-on activities for pupils to explore new ideas				
F	Use a variety of strategies, activities, and assessments during a lesson				
G	Make accommodations for pupils with special learning needs				

3.3	Sesame's TFET techniques were developed for young children in the early grades; however, these techniques may also be useful in other teaching situations. Have you found any of the TFET techniques to be useful to you in your teaching of adults?	Tick appropriate line
A	Yes. Please specify which techniques:	
B	No.	

THANK YOU VERY MUCH FOR PARTICIPATING IN THIS QUESTIONNAIRE.

Appendix D: Master Trainee Interview Tool

Master Trainee Interview RECORD NUMBER_____	TFET Techniques for Effective Teaching Sesame Workshop IDP Foundation, Inc. NORC @ the University of Chicago

About this instrument
This instrument is designed to elicit information from master trainees on their understanding of the pedagogic concepts in TFET materials and experience during the training program. The respondent should be a trainee who has participated in the master training programme at one of the case study teaching colleges and has carried out a step down training at their college.

Before completing this tool, please refer to the associated interview protocol and script.

Data collector:	
Date:	
College name:	
Respondent name:	

CONFIDENTIALITY **Please sign below to indicate your consent to the confidentiality agreement**	I understand that my participation in this study is voluntary. I understand that I may refuse to answer any of the questions and that I may end the interview at any time. I understand that my decision to participate or end the interview will not in any way affect me or my college. I understand that this questionnaire and written record of my responses will be treated as confidential and neither my name nor any name referenced will be used in any written report.
SIGNATURE	

1. MASTER TRAINING EXPERIENCE

1.1	How would you describe your teaching style ***before*** you completed Sesame's Master training? *(Probe for teacher vs. pupil centered and specific examples of strategies/techniques that reflect that style)*
A	

1.2	Now that you have completed the Master training, do you think your teaching style has **changed**? Is there any part of the program that has changed the way you think about teaching? Please explain.
A	

1.3	Do you think the Master training **prepared** you well to train other teachers at your college? Please explain. *(Probe for usefulness of videos, materials, manuals)*
A	

2. STEP-DOWN TRAINING EXPERIENCE

2.1a	When you carried out the step-down training at your college, **to whom** did you teach the techniques? *(Probe for the **roles** of training participants)* (Tick Yes or No for each role)	**Yes (1)**	**No (0)**
A	Professional Development Coordinators		
B	Virtual Learning Troubleshooters		
C	Supported Teaching in Schools Coordinators		
D	Tutors		
E	Student teachers		
F	Other. Specify:		

2.1b	What were the **areas of specialization** of the step down training participants? (Tick Yes or No for each area)	**Yes (1)**	**No (0)**
A	Early Childhood and/or Primary Education		
B	Math and ICT		
C	Social Sciences		
D	Education and Professional Development		
E	Vocational and/or Technical		
F	Science Education		
G	Languages		
H	Other. Specify:		

2.2	**How many** participants did you teach during the step down training?
A	

2.3	**During which month(s)** did you carry out the step-down training to those participants?
A	

2.4	**How long** did the step-down training last? *(Probe for number of hours per session and number of days that training took)*
A	

2.5	**Which modules did you teach during the step-down training?**	**Yes (1)**	**No (0)**
A	Module 1. Fundamentals of teaching and lesson planning		
B	Module 2. Developing a child-friendly classroom		
C	Module 3. Positive Discipline and Classroom Management		
D	Module 4. Developing and Teaching with Creative Low-cost Materials		
E	Module 7. Time Management		
F	Module 8. Practical Ways to Make the Classroom Creative and Fun		
G	Module 9. Differentiated Instruction		
H	Module 10. Evaluation and Assessment		
I	Module 11 Girls Education and Inclusion in the Classroom		
J	Module 12. Ensuring an Inclusive Learning Environment		
K	Module 13. Early Education and Childhood Development		
L	Module 14. Learning Through Play		

2.6	Which module or topic was the most challenging or **DIFFICULT TO TEACH**? Please explain. *(Probe for any specific concepts or techniques that were difficult to teach and why or what was hard for participants to learn)*
A	

2.7	Overall, what do you think is the most **USEFUL** part of the TFET program for college tutors? For student teachers? Please explain. (e.g. particular module, technique, or idea) (**Useful** means something from the TFET training that can be used or applied that is very helpful for teaching)
A	

2.8	I would like to find out more about your training approach. Can you tell me about **HOW** you taught the techniques to training participants? Did *you* use any of the TFET techniques when you trained participants?
A	

2.9	If you could go back and redo the step-down training, what would you change to **IMPROVE** the training for participants? *(Probe for significant **challenges** to stepping down, e.g. timing, materials, use of techniques, and ways to address these)*
A	

3. TECHNIQUES FOR EFFECTIVE TEACHING

3.1	Imagine a student teacher comes to you for advice on how to teach a **pupil-centred lesson**. What advice would you give her? Prompt: What are the three most important things she should do first? Please explain what makes those techniques effective. *(Probe for how those techniques actually promote student learning)*
A	

3.2	In your view, what does it mean to **differentiate** your instruction? What are some techniques you would use to differentiate a lesson for students? Please explain what makes those techniques effective. *(Probe for how those techniques actually promote student learning)*
A	

3.3	I am going to read a statement. After I finish, please state whether you agree or disagree. "Pupils learn better when lessons build on their experiences at home and in the community." Please explain your response (why do you agree or disagree).
A	

3.4	How effective are the following teaching techniques? *Please explain your responses.*	**Not effective (0)**	**A little effective (1)**	**Somewhat effective (2)**	**Very effective (3)**
A	Storytelling by the teacher				
B	Pupils chanting or reciting material				
C	Pupils looking at pictures of concepts				
D	Whole class discussion about a topic				
E	Pupils working together in groups to solve a problem				
F	Pupils viewing a demonstration by the teacher				
G	Pupils listening to the teacher explain a topic				
H	Pupils seeing information written on the board				
I	Pupils acting out or dramatizing a story or concept				
J	*Please explain your responses. (**Probe for WHY techniques are/are not effective**)*				

4. SUPPORTING STUDENT TEACHERS

4.1	We understand there is a new 4-year bachelor of education curriculum being taught in all teaching colleges from GTEC. How is this new curriculum different from the old one (3-year diploma)? *(Probe for any differences that reflect **pupil-centered teaching**)*
A	

4.2	Is pupil-centered teaching different from the way student teachers currently learn to teach? Please explain.
A	

4.3	For newly trained student teachers, what do you think are some of the biggest **challenges** to using Sesame's pupil-centered techniques in their classroom? Please explain.
A	

4.4	In your view, how can newly trained teachers be best supported to use Sesame's pupil-centered techniques in their classrooms?
A	

5. FINAL THOUGHTS

5.1	Is there anything else you would like to share about Sesame's training program? *(Probe for things that could be improved, things that work well, challenges to the training, etc.)*
A	

5.2	Thank you very much for sharing your experience. As a next step in this project, we would like to interview **people who completed the Step-down training**. Are you able to provide contact details for all the people that *you* trained? We would like to have an email address and phone number for each person you trained if that is possible. Would you mind sharing these with me on WhatsApp or in an email, whichever is easiest for you? (*Please refer respondent to spreadsheet template; See recruitment script*)
A	

THANK YOU VERY MUCH FOR PARTICIPATING IN THIS INTERVIEW.

Appendix E: Step-down Trainee Interview Tool

Step Down Trainee Interview RECORD NUMBER_____	TFET Techniques for Effective Teaching Sesame Workshop IDP Foundation, Inc. NORC @ the University of Chicago

About this instrument
This instrument is designed to elicit information from Step down trainees on their understanding of the pedagogic concepts in TFET materials and experience during the training program. The respondent should be a trainee who has participated in a Step-down training programme at one of the case study teaching colleges and has experience stepping down or teaching the techniques to student teachers at their college.

Before completing this tool, please refer to the associated interview protocol and script.

Data collector:	
Date:	
College name:	
Respondent name:	

CONFIDENTIALITY **Please sign below to indicate your consent to the confidentiality agreement**	I understand that my participation in this study is voluntary. I understand that I may refuse to answer any of the questions and that I may end the interview at any time. I understand that my decision to participate or end the interview will not in any way affect me or my college. I understand that this questionnaire and written record of my responses will be treated as confidential and neither my name nor any name referenced will be used in any written report.
SIGNATURE	

1. INFORMATION ABOUT YOU

1.1	What is your primary role at your college?	Tick appropriate line
A	Professional Development Coordinator	
B	Virtual Learning Troubleshooter	
C	Supported Teaching in Schools Coordinator	
D	Tutor	
E	Student teacher	
F	Other. Specify:	

1.2	In your role at your college, do you teach and/or support student teachers in any of the following areas?	Yes	No
A	Early Childhood and/or Primary Education		
B	Math and ICT		
C	Social Sciences		
D	Education and Professional Development		
E	Vocational and/or Technical		
F	Science Education		
G	Languages		
H	Other. Specify:		

1.3	Do you have any experience teaching the following grades?	Yes	No
A	KG1		
B	KG2		
C	KG3		
D	P1		
E	P2		
F	P3		

1.4	What is the highest educational qualification you have completed?	Tick appropriate line
A	SSS/WASSCE (SHS)	
B	Post-secondary Certificate	
C	Diploma/HND	
D	Bachelors Degree	
E	Masters Degree	
F	Doctorate	
F	Other. Specify:	

2. STEP DOWN TRAINING EXPERIENCE

2.1	How would you describe your teaching style ***before*** you completed the Step-down training for Sesame's techniques? *(Probe for teacher vs. pupil centered and specific examples that reflect that style)*
A	

2.2	Now that you have completed the Step-down training, do you think your teaching style has **changed**? Is there any part of the program that has changed the way you think about teaching?
A	

2.3	Do you think the Step-down training **prepared** you well to teach student teachers how to use the pupil-centered techniques? Please explain. *(Probe for usefulness of videos, materials, manuals, training approach, etc.)*
A	

3. TEACHING STUDENT TEACHERS

3.1	**How many** student teachers have you taught to use Sesame's pupil-centered techniques?
A	

3.2	**How often** did you cover Sesame's pupil-centered techniques with student teachers?	**Tick appropriate line**
A	More than once a week	
B	Once a week	
C	Twice a month	
D	Monthly	
E	Other. Specify:	

3.3	Can you tell me about **how you taught student teachers** to use Sesame's pupil-centered techniques? Please describe what you did to teach the techniques during your last meeting with student(s). *(Probe for as much detail as possible, especially **where** teaching occurs, **how long** it usually lasts, **what strategies** are used to teach the techniques, kinds of feedback given to students, etc.)*
A	

3.4	Did *you* use any of the TFET techniques when you taught student teachers? Please explain.
A	

3.5	**Which modules have you taught to student teachers?**	**Yes (1)**	**No (0)**
A	Module 1. Fundamentals of teaching and lesson planning		
B	Module 2. Developing a child-friendly classroom		
C	Module 3. Positive Discipline and Classroom Management		
D	Module 4. Developing and Teaching with Creative Low-cost Materials		
E	Module 7. Time Management		
F	Module 8. Practical Ways to Make the Classroom Creative and Fun		
G	Module 9. Differentiated Instruction		

H	Module 10. Evaluation and Assessment		
I	Module 11 Girls Education and Inclusion in the Classroom		
J	Module 12. Ensuring an Inclusive Learning Environment		
K	Module 13. Early Education and Childhood Development		
L	Module 14. Learning Through Play		

3.6	Which module or topic was the most challenging or **DIFFICULT TO TEACH**? Please explain. *(Probe for any specific concepts or techniques that were difficult to teach and why)*
A	

3.7	Did you experience any other **challenges** to teaching the techniques to student teachers?
A	

3.8	Overall, what do you think is the most **USEFUL** part of the TFET program for student teachers? For college tutors? Please explain. (e.g. particular module, technique, or idea) (**Useful** means something from the TFET training that can be used or applied that is very helpful for teaching)
A	

4. TECHNIQUES FOR EFFECTIVE TEACHING

4.1	Imagine a student teacher comes to you for advice on how to teach a **pupil-centred lesson**. What advice would you give her? What are the three most important things she should do first? Please explain what makes those techniques effective. *(Probe for how those techniques actually promote student learning)*
A	

4.2	In your view, what does it mean to **differentiate** your instruction? What are some techniques you would use to differentiate a lesson for students? Please explain what makes those techniques effective. *(Probe for how those techniques actually promote student learning)*
A	

4.3	I am going to read a statement. After I finish, please state whether you agree or disagree. "Pupils learn better when lessons build on their experiences at home and in the community." Please explain your response (why do you agree or disagree).
A	

4.4	**How EFFECTIVE are the following teaching techniques?** *Please explain your responses.*	**Not effective (0)**	**A little effective (1)**	**Somewhat effective (2)**	**Very effective (3)**
A	Storytelling by the teacher				
B	Pupils chanting or reciting material				
C	Pupils looking at pictures of concepts				
D	Whole class discussion about a topic				
E	Pupils working together in groups to solve a problem				
F	Pupils viewing a demonstration by the teacher				
G	Pupils listening to the teacher explain a topic				
H	Pupils seeing information written on the board				
I	Pupils acting out or dramatizing a story or concept				
J	*Please explain your responses. (**Probe for WHY techniques are/are not effective**)*				

5. SUPPORTING STUDENT TEACHERS

5.1	We understand there is a new 4-year bachelor of education curriculum being taught in all teaching colleges from GTEC. How is this new curriculum different from the old one (3-year diploma)? *(Probe for any differences that reflect **pupil-centered teaching**)*
A	

5.2	Is pupil-centered teaching different from the way student teachers currently learn to teach? Please explain.
A	

5.3	For newly trained student teachers, what do you think are some of the **biggest challenges** to using Sesame's pupil-centered techniques in their classroom?
A	

5.4	In your view, how can newly trained teachers be best supported to use Sesame's pupil-centered techniques in their classrooms?
A	

6. FINAL THOUGHTS

6.1	Is there anything else you would like to share about Sesame's training program? *(Probe for things that could be improved, things that work well, challenges to the training, etc.)*
A	

6.2	Thank you very much for sharing your experience. As a next step in this project, we would like to interview **student teachers that have been taught to use Sesame's TFET techniques**. Are you able to provide contact details for the students you taught to use those techniques? We would like to have an email address and phone number for each student you trained if that is possible. Would you mind sharing these with me on WhatsApp or in an email, whichever is easiest for you? (*Please refer respondent to spreadsheet template; See recruitment script*)
A	

THANK YOU VERY MUCH FOR PARTICIPATING IN THIS INTERVIEW.