Zambian Education School-based Training (ZEST) Project Baseline Study – March 2018

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Executive summary

About the ZEST project

Working with World Vision Zambia (WVZ), the Open University UK (OU) have secured funds from the Scottish Government (SG) to implement a project called Zambian Education School-based Training (ZEST).

The aim of the project is to contribute to improved quality of teaching and learning experiences for children in primary schools in Zambia, in support of effective implementation of the Revised Zambian School Curriculum, by helping primary teachers in Central Province improve the quality of their classroom practice.

Working with The Ministry of General Education (MoGE) in Zambia, the project will do this through co-designing and testing a school based continuing professional development (SBCPD) programme with primary teachers, school leaders and educational officials; implementing the SBCPD programme with up to 4000 primary teachers in 4 target districts in Zambia's Central Province; and building capacity of MoGE officials in implementing the programme to help the MoGE in operationalising their national In-Service Strategy[1].

Aim of the study

The aim of the baseline study is to establish the current situation in 4 target districts of Chisamba, Kabwe, Mumbwa and Shibuyunji, in Central Province, with regard to active teaching and learning and teacher engagement in collaborative SBCPD, prior to project execution.

The study will contribute to the overall monitoring and evaluation framework for the project. It seeks to establish benchmarks for three key Logical Framework (Logframe, Appendix 2) indicators and provide baseline values for these indicators against which ZEST project progress can be measured during implementation and after the project is completed.

Research questions

The research questions the baseline study seeks to address are:

1. What observable classroom practices with respect to active teaching and learning are currently taking place in primary schools in the 4 target districts of Central Province
2. What is the amount and nature of teachers' participation in collaborative SBCPD in primary schools in the 4 target districts of Central Province over the past 3 terms (May 2017, September 2017, January 2018)

Study methodology

The baseline study was a mixed method study with a sample of schools selected by proportional quota sampling based on the distribution of schools amongst the 4 target districts of Chisamba, Kabwe, Mumbwa and Shibuyunji, and the spread of urban, semi-rural (containing some rural and some urban schools) and rural zones. Within each zone, schools for the sample were randomly selected. Within each school, participating teachers were randomly selected.

In order to answer the research questions, the study collected qualitative data and quantitative data using face-to-face interviews, review of school documents e.g. the School In-service Record (SIR), and lesson observations. The lesson observations were undertaken using a 'time sampling' method

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[1] In-Service Strategy in Zambia, MoGE, Republic of Zambia, April 2017.

in which enumerators employed an 'instantaneous time sampling' technique to record what the teacher and the learners were doing every 2 minutes throughout the duration of the lesson.

The data were collected with 3 tablet-based tools using KOBOToolbox software, and analysed using a range of software (Excel, Nvivo, SPSS and Tableau).

Data collection for the study was overseen by WVZ and undertaken by 24 external enumerators (12 female and 12 male) in Zambia from 19th to 23rd March 2018. The analysis and report were undertaken by the OU and reviewed by an external consultant.

The study was completed in March 2018 and included visits to 54 schools in which 140 lesson observations, 204 teacher interviews and 54 CPD interviews with headteachers (or school in-service coordinators, SICs) were conducted.

Classroom practices

This aspect of the study sought to answer the first research question:

> What observable classroom practices with respect to active teaching and learning are currently taking place in primary schools in the 4 target districts of Central Province

Data for this were drawn from 204 teacher interviews and 140 teacher lesson observations.

The lesson observation data in particular, provide a rich picture of what is happening in lessons in terms of what the teacher is doing and what the learners are doing. Reported data on teacher's confidence and use of active teaching and learning approaches were less representative of what was observed taking place in lessons.

On analysis, the most reliable measure for observable active learner engagement was found to be the time learners spent talking or working in groups and pairs. Reading, writing and the nature of questioning were found to be less reliable measures of active learning, as, in spite of some training, enumerators found it difficult to interpret these activities. They had not made a clear distinction between writing and writing (not copying); reading was mainly one child reading aloud to the class, and questions were not in fact differentiated as 'open' or 'closed'. For the purpose of this study therefore, it was decided to focus on working or talking in groups or pairs as proxy measures for active teaching and learning.

In interviews, teachers reported high confidence in and use of group and pair work. However, the use of these in the observed lessons was much lower, with the median of lesson time when teachers used pair work or group work being just 5% of the lesson.

The key findings in relation to classroom practices are:

- **The data (across all representations) are suggestive of predominantly teacher-led lessons and passive involvement of learners;**
- **Lesson observations suggest low levels of group and pair work in practice;**
- **The average proportion (mean) of lesson time in which learners were engaged in group or pair work activities is 9% (4 minutes);**
- **The mid proportion (median) of lesson time in which learners were engaged in group or pair work activities however, is just 5% (2 minutes), suggesting that a small proportion of teachers are using more group and pair work, helping raise the mean;**
- **41% of lessons observed have no evidence of group or pair work;**
- **The use of group work is more common than the use of pair work;**
- **Teachers report high levels of confidence and use of group and pair work.**

School based teacher collaboration and continuing professional development

This aspect of the study sought to answer the second research question:

> What is the amount and nature of teachers' participation in collaborative SBCPD in primary schools in the 4 target districts of Central Province over the past 3 terms (May 2017, September 2017, January 2018)

Data for this were drawn from 54 CPD interviews with headteachers and SICs, which included collecting data from schools' in-service record (SIR), as well as from 204 teacher interviews.

Teacher Group Meetings (TGMs) are a well-established feature of the SPRINT SBCPD system in Zambia and schools have regular TGMs as part of their SBCPD programme. As outlined in the In-service Strategy in Zambia (2017), the expectation from the MoGE is that schools in Zambia will have regular (mostly fortnightly) TGMs to collaborate, using the Lesson Study approach, in support of their Continuing Professional Development in the two key areas of content knowledge and pedagogy or methodology.

The key findings in relation to school based teacher collaboration and continuing professional development are:

- **The average (mean) number of Teacher Group Meetings (TGMs) held per term over the past three terms is 3. The mid (median) number of Teacher Group Meetings (TGMs) held per term over the past three terms is 2, suggesting that a small proportion of schools are holding more TGMs and helping raise the mean;**
- **22% of schools did not have any TGMs in term 2 of 2017, 24% in term 3, and 19% in term 1 of 2018;**
- **43% of schools held an average of 3 or more TGMs over the 3 terms;**
- **Only in 7% of schools was Lesson Study specifically reported as part of their SBCPD or TGMs;**
- **From the interviews and school record data, it was not possible to come to robust conclusions as to the proportion of TGMs which involved collaborative SBCPD. This would require a more complete qualitative study of the actual events or a more detailed interview of teacher participants; however, even with a generous inference of what was implied, only about half (48%) of the activities recorded could be attributed as collaborative SBCPD.**

Implications for the ZEST project Logframe indicators, baselines values, measures and milestones

The project Logframe (Appendix 2) sets out key indicators and milestones against which project progress will be measured. Most of these indicators are 0 at the baseline, as they relate to specific activities to be undertaken as part of project implementation. However, this baseline study, and its research questions, were set out to provide information on the current situation in schools in the 4 target districts in Central Province in Zambia, in order to establish a baseline and suggest milestones for two outcome indicators and one output indicator, which are:

Outcome
- Outcome indicator 1: % participating teachers demonstrating improved classroom practice
- Outcome indicator 2: % of participating schools implementing the school-based professional development programme, recording an increase in collaborative work

Output
- Output indicator 1.4: % of participating teachers reporting increased confidence in collaborative classroom practices

Each are dealt with in turn, drawing on the findings from the study.

Outcome indicator 1

% of participating teachers demonstrating improved classroom practice (above the baseline, measured by the median proportion of time learners are working / talking in groups or pairs, in a sample of observed lessons)

Baseline: 5% (median)

Proposed Revised Milestones: Year 1[2] – 5% (median); year 2 – 8% (median); year 3 – 10% (median); year 4 – 10% (median); year 5 – 10% (median)

These adjusted measures, and therefore related milestones, are proposed as a result of this study.

It should be noted that the number of teachers targeted will increase significantly, from cohorts of 200 (years 2 and 3) to 2000 in year 4, when the SBCPD programme will be implemented more widely, so, though the 10% remains constant, it in fact represents a significant increase as a result of the increase in scale.

There is a considerable variation across the sample in the proportion of teachers' lessons which demonstrate active teaching and learning in the lesson observation data. Measuring progress of specific teachers would therefore require a longitudinal, pre and post intervention observation, an approach which is outside the scope of the project. This can however be addressed by measuring the proportion of lesson time teachers engage learners in active learning, in this case defined as working or talking in groups or pairs. This amounts to a similar measure, but is more meaningful in relation to a sample based methodology.

By this adjusted measurable milestone, the project would in fact aim to double (on average, across the population) the proportion of lesson time in which participating teachers engage learners in active teaching and learning. The project would seek to sustain the level of improvement from year 3 onwards while increasing the scale in terms of the numbers of teachers who participate.

This is significant in statistical terms as an increase in the median from the baseline 5% to a target of 10% represents an improvement with estimated effect size of 0.336 standard deviation (see Hattie for the kind of effect sizes that are expected from innovations[3], and Cohen[4]).

Outcome indicator 2

% of participating schools implementing the school-based professional development programme, recording an increase in collaborative work amongst teachers (above the baseline, measured as participating schools which hold ≥3 TGMs per term)

Baseline: 43%

Proposed Revised Milestones: Year 1[5] – 43%; year 2 – 45%; year 3 – 60%; year 4 – 60%; year 5 – 60%

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[2] Year 1 of the ZEST project is 6 months, from October 2017 to March 2018, in which the project was initiated and the baseline study conducted; therefore, the year 1 targets are the same as the baseline values.
[3] Hattie, J. (2008). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge.
[4] Cohen, Jacob (1988). Statistical Power Analysis for the Behavioural Sciences. Routledge. ISBN 1-134-74270-3.
[5] Year 1 of the ZEST project is 6 months, from October 2017 to March 2018, in which the project was initiated and the baseline study conducted; therefore, the year 1 targets are the same as the baseline values.

The aim is to increase the opportunity for collaboration amongst teachers by increasing the number of participating schools holding 3 or more TGMs per term. The threshold of 3 TGMs per term is set on balance of the mean and median from the baseline study as well as the feedback from the design workshops held in Chisamba in February 2018.

Based on the findings of this study, it is suggested that the targets be be maintained throughout years 3-5 to account for the project scaling up to more schools in these years, where the challenge will be maintaining the same gains at greater scale. The MoGE have also clarified that the number of TGMs is a matter for schools to decide based upon their circumstances and needs and there is a risk of the ZEST SBCPD programme being too prescriptive or burdensome for some schools to maintain if higher targets are set.

Output indicator 1.4

% of participating teachers reporting increased confidence in collaborative classroom practices

As a result of this study, a revised output indicator is proposed:

% of participating teachers recording use of collaborative classroom practices (measured by sampling participating teachers' ZEST project logs and journals in which teachers record their activity plans, pedagogic practice, and reflections on use)

Baseline: 0%

Proposed Revised Milestones: Year 1[6] – 0%; year 2 – 10%; year 3 – 30%; year 4 – 30%; year 5 – 50%

Instead of measuring teacher's reported confidence in using collaborative active teaching and learning approaches, the proposed revised indicator will reflect actual recorded practice in and use of active collaborative teaching practices by participating teachers.

Table 1: Summary of where indicators are dealt with in the report

	Logframe indicator	Report section
Outcome indicator 1	% participating teachers demonstrating improved classroom practice	3.1, 4.2
Outcome indicator 2	% of participating schools implementing the school based professional development programme, recording an increase in collaborative work	3.2, 4.2
Output indicator 1.4	% of participating teachers reporting increased confidence in collaborative classroom practices (Revision proposed: % of participating teachers recording use of collaborative classroom practices)	3.1.1, 4.2

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[6] Year 1 of the ZEST project is 6 months, from October 2017 to March 2018, in which the project was initiated and the baseline study conducted; therefore, the year 1 targets are the same as the baseline values.

Looking forward: How the ZEST project will work

ZEST aims to strengthen existing systems and processes for teachers' school-based continuing professional development (SBCPD) already put in place under the School Programme of In-Service for the Term (SPRINT) system. It provides training, tools and resources to support teachers' planning, implementation and reflection on their practice with a focus on peer support. Throughout the ZEST materials and workshops, this approach is referred to as a 'Teacher Toolkit'. Assisted by the use of this Toolkit, the ZEST project works with primary teachers in order to enhance their teaching skills in all subjects across the primary curriculum. The outputs from the ZEST project include a co-designed and tested SBCPD programme that will be available online and offline; the implementation of the SBCPD programme in the 4 target districts of Chisamba, Kabwe, Mumbwa and Shibuyunji to reach up to 4000 primary school teachers; and the building of capacity of MoGE officials through training, to enable them to implement the SBCPD programme more widely.

It is expected that as a result of the ZEST project more children will experience active engagement in lessons and teachers will become steadily more proficient in enacting a more learner-centred approach to their classroom practice. A number of changes are anticipated, including:

- More opportunities for learners to talk about their learning through open-ended questioning, group work and pair work;
- More inclusive practices (eg use of learners' names, display of learners' work, teachers moving around the classroom to involve all learners)
- More formative assessment through informal conversations with learners
- A greater range of types of questions asked
- Less lecturing by the teacher
- Less copying from the chalkboard, or text books
- More opportunities for learners to write about their own ideas

Data have been collected on these aspects of teaching and learning, but the difficultly in ensuring consistency across a large sample means that the proxy indicator used to capture the current practices in Zambian classrooms for the Logframe is **the time spent during the lesson in which students were talking in groups or pairs**. The end-line study will report on progress against this Logframe indicator, but also include a narrative around other observed practices.

The ZEST project encourages the use of active and collaborative teaching approaches in the lessons. It therefore aims to reduce the number of teachers who 'never' or 'less than once a week' use pair work or group work, and to increase the number of those who use these approaches on a regular basis. The intention is that, as a result of ZEST, a greater proportion of the lesson time will involve students working in pairs or groups. The ZEST project provides resources to be used in at least 3 Tutor Group Meetings (TGMs) per term, with follow-up between TGMs in the teachers' own classes and through peer conversations between teachers. It is intended that these resources for TGMs will increase collaborative activities in TGMs in the participating schools, by providing specific activities for teachers to discuss. It is envisaged that, as a result of the ZEST project, more TGMs will take place, and in particular, a more consistent number across the three terms in a school year.

As a result of ZEST, through the provision of the 'Teacher Toolkit' and a progressive programme of activities for TGMs, there will be greater correlation between what teachers say they do, and what teachers actually do in the classroom. Participating teachers will plan, reflect and record the use of collaborative classroom practices in their classrooms.

Change in classroom practice is a slow and ongoing process, moving at different speeds for individual teachers and dependent upon many intrinsic and extrinsic factors. The ZEST project will implement a scalable, school-based teacher development programme (SBTPD), building and improving on existing practice and supporting an active learner-centred approach with a focus on improving learning outcomes across Zambia and increasing collaborative work among teachers.

1   Introduction

1.1 About the ZEST project

Zambian Education School-based Training (ZEST) is a pedagogic School-Based Continuing Professional Development (SBCPD) project based in 4 districts in Central Province in Zambia. The aim of the project is to contribute to improved quality of teaching and learning experiences for children in primary schools in Zambia, through improvements of the classroom practices of primary teachers, and effective implementation of the Revised Zambian School Curriculum. The project is funded by the Scottish Government and implemented by The Open University UK and World Vision Zambia (WVZ) in collaboration with the Ministry of General Education (MoGE) in Zambia.

The ZEST project will work with primary teachers in order to enhance their teaching skills in all subjects across the primary curriculum. The outputs from the ZEST project will include a co-designed and tested SBCPD programme that will be available online and offline; the implementation of the SBCPD programme in the 4 target districts of Chisamba, Kabwe, Mumbwa and Shibuyunji to reach up to 4000 primary school teachers; and the building of capacity of MoGE officials to implement the SBCPD programme more widely (see ZEST theory of change in Appendix 1).

During the co-design phase (years 1-3), the training programme will be developed and tested through an iterative process, by up to 3 cohorts of teachers in Chisamba district. In the subsequent phase (years 3-5), it will be implemented in Mumbwa, Kabwe and Shibuyunji districts, working with MoGE officials to develop models of use that will enable the Ministry to make the programme available for use across Zambia. The programme will be designed as a set of activities based on collaborative and active learner-centred teaching approaches to be planned by teachers working together at school level in Teacher Group Meetings (TGMs), and carried out in their lessons.

ZEST will strengthen existing systems and processes for teachers' school-based continuing professional development (SBCPD) by providing training, tools and resources – a 'teacher's toolbox' -- to support teachers in planning, doing and reflecting on their practice. It will use the OU's *Teacher Education in Sub-Saharan Africa (TESSA) Open Educational Resources (OER)[7]* and the *TESSA Curriculum Guide[8]*, which connects the TESSA OER and the Revised Zambia School Curriculum, to help teachers develop ideas for more engaging classroom activities.

1.2 Rationale and aims of the study

This baseline study will focus on two areas in particular:

1. Classroom practice
2. Teachers' participation and collaboration in SBCPD

The aim is to establish the current situation with regards to the use of active teaching and learning approaches in primary school classrooms and teacher's engagement in SBCPD, in the 4 project target districts in Central Province, in Zambia.

To focus the study, the following two research questions were formulated:

1. What observable classroom practices with respect to active teaching and learning are currently taking place in primary schools in the 4 target districts of Central Province

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[7] TESSA OER have been contextualised for Zambia and provide practical examples of active teaching approaches. These resources will be made available to the ZEST project target teachers.

[8] The TESSA Curriculum Guide was produced in July of 2017 by a team of teachers, college lecturers (from Colleges of Education), and Ministry of General Education (MoGE) officers.

2. What is the amount and nature of teachers' participation in collaborative SBCPD in primary schools in the 4 target districts of Central Province over the past 3 terms (May 2017, September 2017, January 2018)

The findings of the study will help establish a baseline prior to project implementation, inform refinements to the implementation approach and contribute to the overall monitoring and evaluation framework for the project. It will help to set baseline values, suggest benchmarks for key Logical Framework (Logframe) indicators, and provide values for these indicators against which progress can be measured during implementation and after the project is completed. This will enable future assessment of the delivery, effectiveness, value for money (VfM), and impact of the project and reporting of the findings and lessons learnt through these processes.[9]

The findings of the study will primarily be used by the:

- project management team to enable reporting to stakeholders, in particular the Scottish Government (the funder), and the Ministry of General Education in Zambia;
- project evaluators at midline and endline to evaluate the delivery, effectiveness, VfM, and outcomes of the project;
- Scottish Government to assess the delivery, effectiveness, VfM, and impact of the project;
- Ministry of General Education, Zambia, to assess progress of the project implementation and the effectiveness and scalability of the SBCPD programme developed to enhance SPRINT[10] and Lesson Study[11];
- project management team to confirm the relevance of Logframe indicators or to propose changes to the Scottish Government;
- project management team and project stakeholders to engage in adaptive management, and inform improvements in the delivery of the project during its lifetime;
- project management team and MoGE to support the on-going development and implementation of the project's sustainability and succession strategies;
- OU's academic team to inform the planning of project activities (workshops and materials development);
- OU's academic team as part of an on-going programme of research into international education development and teacher education, at the OU.

1.3 Literature review

Sustainable Development Goal 4 (SDG) is concerned with improving educational outcomes for children, through a focus on their classroom experiences, the quality of teaching and the quality of teachers. In Zambia, this is being addressed through the provision of a Revised School Curriculum which sets out skills and values that should be taught, alongside knowledge. The question of what constitutes 'quality' is much debated, but some consensus is emerging. Bold et al., (2017), in a study across 7 sub-Saharan African countries, demonstrated the link between good teaching and student outcomes, and highlighted the importance of teachers' 'pedagogical content knowledge' (knowledge about how to represent the subject to learners). Alexander (Alexander, 2015) identifies 'pedagogic universals' – teaching approaches which transfer across contexts – which include providing

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[9] Please see DAC 'Criteria for Evaluating Development Assistance' http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm for further guidance.

[10] SPRINT, or School Programme of In-service for the Term, is the MoGE's framework for school based continuing professional development for teachers in Zambia.

[11] Lesson Study is an 8-step cycle borrowed from Japan which sets out a process of collaborative planning, doing, reflecting, and refining for developing teaching skills. This is currently what MoGE would like teachers to do in TGMs; ZEST offers enhancements based on feedback from teachers, head teachers and MoGE officials.

opportunity for discussion, teacher questioning and the giving of formative feedback. Policy aspirations across Africa, suggest that quality will be achieved through the adoption of 'learner-centred' approaches, but this remains a contested term. Nevertheless, there is a growing acceptance that more 'learner-centred education' could deliver improvements in quality (EFA GMR Team, 2016; Ministry of Education and Ministry of Higher Education, Science, Technology, 2012; Schweisfurth, 2013). However, the evidence suggests that it is difficult to achieve (O'Sullivan, M., 2004; Schweisfurth, 2011; Vavrus, 2009). Schweisfurth (Schweisfurth, 2015) sets out a set of 'minimum criteria' for learner-centred teaching; these criteria are included in the ZEST Teacher Notebook and have informed the design and implementation of ZEST.

There is also a call for more school-based professional development for teachers – training which does not take them away from their classrooms and does not rely on cascade models of delivery (Moon and Umar, 2013; Power, 2018).

In Zambia, the Revised School Curriculum calls for 'learner-centred approaches' and school-based continuing professional development is embedded in the system, through regular 'Teacher Group Meetings (TGMs)'. The challenge is that currently, there are no resources to support TGM discussions and activities.

ZEST will provide resources in the form of TESSA OER and a teachers' handbook which explains different teaching approaches. TESSA OER provide practical examples of classroom activities (showing teachers how to teach the primary curriculum as well as what to teach), and the evidence from monitoring and evaluation of the TESSA programme suggests that, where TESSA is mediated and embedded, it supports teachers in developing more active approaches to teaching and learning. (Harley and Simiyu Barasa, 2012; Murphy and Wolfenden, 2013; Wolfenden, 2008; Wolfenden et al., 2010). The basis of the ZEST SBCPD programme will be the developing of pedagogical content knowledge (Bold et al., 2017), the promotion of strategies that have been shown to work across contexts (Alexander, 2015), and a focus on the attitudes and values associated with learner-centred approaches (Schweisfurth, 2015).

2 Methodology

2.1 Research questions

The research questions were:

1. What observable classroom practices with respect to active teaching and learning are currently taking place in primary schools in the 4 target districts of Central Province
2. What is the amount and nature of teachers' participation in collaborative SBCPD in primary schools in the 4 target districts of Central Province over the past 3 terms (May 2017, September 2017, January 2018)

2.2 Study design and research tools

This was a mixed method study with a sample of 54 schools, designed to establish current classroom practices with respect to active teaching and learning approaches, teachers' perceived confidence in using these approaches, teacher's engagement with SBCPD, and the extent of collaboration amongst teachers.

In order to answer the research questions, the study collected qualitative data (observations and interviews) and quantitative data (systematic observations and questionnaires).

The interviews were highly structured, with only a few 'free responses'. The free responses were analysed using thematic analysis; codes were generated based on the range of responses.

The lesson observation schedule was devised based on the observable behaviours, taking into account the literature described above on learner-centred education, the 'pedagogic universals' that underpin quality education and national policy aspirations. The aim was to identify instances in which:

- Teachers asked open questions
- Teachers moved around the room to support students
- Teachers provided feedback to learners
- Learners worked or talked in groups or pairs
- Learners engaged in writing which was not copying
- Learners were reading

Questions alongside the lesson observation asked enumerators to comment on other aspects of classroom practice: the use of resources, the amount of student work displayed in the classroom and the extent to which the teacher used the learners' names.

Three baseline study tools were developed jointly by the OU academic team and the World Vision (WVZ) monitoring team (Appendices 4 to 6):

a. **Continuing Professional Development (CPD) interview (Appendix 4)**: The purpose of this interview was to gather a picture of frequency and nature of SBCPD taking place and the extent of participation by teachers. This involved interview questions for the head teacher (or their representative) about the TGMs and taking some photographs of pages of the School In-service Record (SIR), in order to establish the number of TGMs taking place and the topics that were discussed.

b. **Teacher interview (Appendix 5)**: At least five teachers were interviewed in each school. The purpose of the interview was to gather information about their practice, their confidence in active teaching approaches and their involvement in CPD.

c. **Teacher lesson observation (Appendix 6)**: Three of the five teachers in each school were observed teaching a lesson. This was arranged on the day and with teacher's consent. There were a few questions to be completed before the lesson; a tick sheet to complete every two minutes during the lesson, and some questions for enumerators to answer after the observed lesson.

All participants were volunteers (in accordance with OU ethical research guidelines), and had the right to withdraw until the end of the data collection period. Each participant was provided with information about the study and how the data would be used.

Data collection was completed using face-to-face interviews, review of school documents e.g. the School In-service Record (SIR), and lesson observations using tablet-based questionnaires.

The teacher/lesson observations were undertaken using a 'time sampling' method, with a tool that was quantitative in nature (Appendix 6). Throughout the entire duration of the lesson, the enumerator employed an 'instantaneous time sampling' technique to record what the teacher and the learners were doing every 2 minutes (i.e. at minutes 1, 3, 5, 7, and so forth). Table 2 shows the pre-coded activities which enumerators could select from, plus an 'other' option where they could add notes for activities that did not fit within the given categories. The observers could note any further details that would complete the account of the lesson, and additional information was recorded about the classroom environment.

Table 2: Categories of activities for lesson observations

The teacher is	The learners are
1. Presenting or explaining	1. One is giving answers
2. Organising learning tasks or activities	2. Chorusing replies
3. Asking learners open questions	3. Working or talking in pairs
4. Giving feedback	4. Working or talking in groups
5. Walking around the classroom	5. Reading
6. Observing or listening to learners	6. Writing (not copying)
7. Other	7. Listening
	8. Other

The observation schedule was constructed on the basis that observable behaviours which correspond to 'active' teaching approaches include teachers asking open questions, learners talking in groups, teachers walking around the room, observing learners working or giving feedback (Alexander, 2015).

The link between the research questions and the data collection tools is given in Table 3.

Table 3: Research questions and study data collection tools

Research question	CPD interview	Teacher lesson observation	Teacher interview
What observable classroom practices with respect to active teaching and learning are currently taking place in primary schools in the 4 target districts of Central Province		Data from the observation showing correlated t/l activity every 2 mins Other activities that took place other than the pre-coded tick list	Questions 18, 19, 20, 21

		Questions 12, 13, 14, 15, 16 –inclusive practices, resource use, displaying of pupil's work	
What is the nature of teachers' participation in collaborative SBCPD in primary schools in the 4 target districts of Central Province over the past 3 terms (May 2017, September 2017, January 2018)	Questions 5, 5.1 5.2 – number of TGMs Questions 6, 6.1 6.2 Questions 7, 7.1 7.2 Questions 5.3, 6.3, 7.3 – focus of meetings Question 12 – other CPD activity		Question 9 – number of TGM attended this term (compare to Question 7 on CPD interview) Questions 10, 11, 12, 13

2.3 Data collection and timeline

Data collection for the study was undertaken from 19th to 23rd March 2018 by a team of 24 external enumerators in Zambia. The enumerators (12 female and 12 male) were recruited using the following criteria:

- A Diploma/Degree in Education (key was a Degree in Primary and Secondary Education with teaching practice experience as an added advantage).
- Data collection experience and computer literacy.
- Good communication and interpersonal skills.

A total of 54 school data collection visits were undertaken over the five days. In order to maximise time efficiency in covering the target districts, the enumerators were divided into four teams, each with an enumerator team leader and five enumerators. Each team was supervised by a WVZ education staff member.

Enumerators underwent four days of training, which covered issues such as research ethics, interview techniques, terms used in the Zambian Education system, hands-on practice with the tablet-based questionnaires and lesson observation system. Pre-testing in schools helped ensure familiarity and reliability with the data collection tools and system. This allowed for a degree of reliability testing, particularly in regards the timed lesson observation system.

As part of the quality assurance process, the data collection forms were uploaded to the server and downloaded to tablets and tested prior to the training. Furthermore, data were collected offline and uploaded online only after being checked for accuracy and consistency. Each enumerator reviewed the data entered before submitting it to the supervisor for a second review. On day 1 the error rate was higher, at 15%; however, this dropped to below 3% on subsequent days as the enumerators gained experience.

Since the teams were not familiar with the location of all the schools in the districts, they were accompanied by district officials from the Ministry of General Education who helped locate the schools in the selected sample. Officials were not present during interviews or lesson observations and did not participate in the data collection, though they remained with the team in the school.

Teams spent on average 4 hours in each school. Where practical, interviews and observations were carried out simultaneously.

The school was not aware of the details of the visit in advance in order to avoid stage-managing. The interview and observation schedule was drawn up with the school on arrival; teachers were then given the opportunity to consent or withdraw from the process.

At each school one school administrator, and up to five teachers were interviewed. Where there were more than five teachers in the school, the five teachers interviewed were randomly selected from the primary school teachers present.

Lesson observations were conducted for three teachers from the five interviewed, with a focus on observing a balance of grades and subjects where possible.

The data collected were anonymised by using a code for each respondent, so that the reported responses could not be identified with individuals by the data analyst.

Data collection was completed using the KOBO Toolbox system[12] input on tablets.

2.4 Data analysis

Data from the Kobo system were exported for quantitative analysis using Excel, SPSS and Tableau; and qualitative analysis using Nvivo software. A content analysis was undertaken of the qualitative responses and observations to provide additional richness to the quantitative analysis (see Appendix 8 for an example).

The steps in the analysis were:

- Data checking -- carried out in the field and by WVZ before analysis commenced.
- Data checked again by consultant analyst to confirm it was clean.
- Aggregation of teachers' responses to the teacher interview.
- Aggregation of teachers' responses to questions before and after the teacher lesson observation.
- Aggregation of data from the CPD interview on numbers and attendance at TGMs.
- Statistical analysis of the quantitative data from the lesson observation charts was completed using SPSS, Excel and Tableau for the presentation.
- Qualitative analysis of the 'other' category on the lesson observation chart. Where 'other' was described in terms of an existing category, the data were incorporated into the quantitative analysis. Qualitative data analysis was carried out using Nvivo.
- Qualitative analysis of the CPD interview data to determine how TGMs are used. Qualitative data analysis was carried out using Nvivo.

The analysis was carried out by researchers based at the OU, but who were not part of the ZEST project team.

2.5 Population and sample

A sample of 54 schools were selected for the study. Proportional quota sampling was applied based on the distribution of schools amongst the 4 target districts and the spread of urban, semi-rural (containing some rural and some urban schools) and rural zones. The zones were as follows:

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[12] http://www.kobotoolbox.org

Rural: Chisamba district *(Kabanga, and Mututu zones);* Mumbwa district *(Sanje, Myooye, Nachiluka, and Mumba zones)*; Shibuyunji district *(Mwembezhi, and Nampondwe zones)*

Semi-rural: Chisamba district *(Chisamba zone)*

Urban: Kabwe district *(Katondo, and Chindwin zones)*

Within each zone, schools for the sample were randomly selected.

The baseline study involved 54 schools and interviews with 258 staff in these schools, including 204 teacher interviews and 54 CPD interviews. The size of the schools varied considerably (see below); some teachers were absent and some schools did not have 5 teachers, meaning that we were not able to interview the intended 270 teachers. The characteristics of the schools involved were varied in terms of location, type and size. Tables 4, 5 and 6 show some of the characteristics of the schools and how these compare to schools in Central Province overall. The data show that the sample was representative of the schools in Central Province, except for the fact that Community Schools were under-represented. This reflects the rural nature of these schools, and the difficulties in reaching remote schools during the wet-season.

Table 4: Type of schools in study compared with Central Province

School type	Number of schools in study	Percentage of schools in study	Number of schools in Central Province[13]	Percentage of schools in Central Province[14]
Community school	8	15%	339	33%
Government and government zonal school[15]	46	85%	624	60%
Other	0	0%	79[16]	7%
Total	**54**	**100%**	**1042**	**100%**

Table 5: Location of schools in study compared with Central Province

Location	Number of schools in study	Percentage of schools in study	Number of schools in Central Province[17]	Percentage of schools in Central Province[18]
Urban	6	11%	121	12%
Rural	48	89%	921	88%
Total	**54**	**100.00%**	**1042**	**100%**

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[13] Zambia Educational Statistical Bulletin 2016, Table 4
[14] Zambia Educational Statistical Bulletin 2016, Table 4
[15] Zonal schools are hubs for other schools in the zone and are often where CPD activities take place.
[16] 58 Private schools and 21 grant-aided schools
[17] Zambia Educational Statistical Bulletin 2016, Table 5
[18] Zambia Educational Statistical Bulletin 2016, Table 5

Table 6: Grades offered by schools in study compared with Central Province

Grades offered	Number of schools in study	Percentage of schools in study	Number of schools in Central Province[19]	Percentage of schools in Central Province[20]
Grades 1-4	0	0%	56	5%
Grades 1-7	28	52%	403	36%
Grades 1-9	24	44%	361	32%
Beyond grades 1-9	2	4%	51[21]	5%
Others	0	0%	252[22]	22%
Total	**54**	**100%**	**1123**	**100%**

The Baseline study included 54 schools in the 4 target districts from Central Province where the ZEST project will be implemented. The data below summarises the information on the range of schools, and number of teachers and learners in the schools included in the baseline.

- 13 (24%) schools in Chisamba, 28 (52%) in Mumbwa, 7 (13%) in Kabwe, and 6 (11%) in Shibyuni.
- 85% (46) were government schools (including 7 zonal schools), and 15% (8) community schools.
- 89% (48) of schools were in rural areas, and 11% (6) in urban areas.

Teacher interviews and lesson observations were only undertaken for those working in grades 1 to 7.

Many schools in Zambia operate shifts to accommodate for the number of learners in the local area. In these schools some teachers will teach more than one cohort of learners.

- 72% (39) of the schools in the baseline operated more than one shift of primary classes each day.

This meant that the schools in the baseline had between 7 and 35 classes. Although the majority of schools had between 1 and 9 classrooms, there were some which had over 20 classrooms.

The number of teachers in the schools varied from 4 to 55, with an average number of teachers per school of 13. In terms of gender balance, 6 schools indicated they had no female teachers (these were schools with 4, 6 or 7 teachers), but there were 26 schools with more female teachers than male teachers. Table 7 shows how the sample of teachers in the study compares with the population of teachers in Central Province.

Table 7: Gender of teachers in the study compared with Central Province

Interview	Number of teachers in study	Percentage of teachers in study	Number of teachers in Central Province	Percentage of teachers in Central Province
Female teacher interviews	121	59%	4,696	51%
Male teacher interviews	83	41%	4,539	49%

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[19] Zambia Educational Statistical Bulletin 2016, Table 6
[20] Zambia Educational Statistical Bulletin 2016, Table 6
[21] Includes grades 1-12, grades 8-9, grades 8-12, grades 10-12.
[22] Many are private schools which are outside the scope of MoGE SBCPD, this study and the ZEST project.

Female teacher lesson observation	84	60%	4,696	51%
Male teacher lesson observation	56	40%	4,539	49%

The numbers of learners in the schools ranged from 193 to 1923, with an average of around 300 learners.

In all, 54 CPD interviews, 140 teacher lesson observations, and 204 teacher interviews took place across the 54 schools in the sample. Table 8 shows the characteristics of the respondents in the sample, disaggregated by gender where this information was available.

Table 8: Total study responses (after data checking)

Tool	Total responses
CPD Interview	54
Teacher interview	204 (121 F, 83 M)
Teacher lesson observation	140 (84 F, 56 M)

Observed lessons

A total of 140 teacher lesson observations were undertaken (in 54 schools) and the data analysed quantitatively and qualitatively. This was slightly less than intended (162) owing to teacher absence and some schools having fewer than 3 teachers. The lessons observed ranged from Grade 1 to Grade 7 and included Mathematics, English, Integrated Science, Social studies, Zambian languages, Technology studies, Home economics, Literacy, and Environmental science. 84 teachers were female and 56 male (see Table 8 above). The average attendance at the lessons was 41 learners, with attendance at the lessons observed ranging from 8 (3 females, 5 males) in a Literacy grade 4 lesson, to 85 (51 Females, 34 males) in a Mathematics Grade 7 lesson.

CPD interviews

54 interviews were undertaken with staff managing the school in-service or professional development programme, including 22 (41%) School In-service coordinators (SIC), 18 (33%) head teachers, 9 (17%) deputy head teachers, 3 (5%) senior teachers and 2 (4%) Zone In-service Coordinators (ZIC).

Teacher Interviews

There were 204 interviews with teachers, of whom 121 were female and 83 male. They taught classes 1-7 and ranged in experience from being newly qualified to 32 years of experience.

2.6 Limitations and challenges

Rainy season and impassable roads: The fact that data collection was conducted during the rainy season meant that some roads were impassable. Due to this, certain zones were identified as being the most accessible. Schools within the zones were selected randomly, but if one of those proved to be inaccessible in the conditions, an alternative was identified by the District Education Board Secretary. In all, 8 alternatives were used (15%). This reduced the number of schools visited and contributed to teacher absences and thus reduced teacher numbers.

Differences in teaching approaches across grades: The ZEST project will work with all the teachers in the participating schools, from grade 1 to 7, and the baseline covered the same range of classes. This wide range of classes presented some difficulties in gathering quantitative data as teaching approaches can be quite different both between grade 1 and 7 classes and the subject matter. This

further contributed to the decision to focus on the measurable, observable examples of learners working or talking in groups or pairs.

Low staffing in schools: Some schools did not have a sufficient number of teachers in school at the time of data collection (some teachers came in the morning, others at mid-morning and afternoon). In these cases, the available teachers were interviewed and lessons observed.

School record keeping: Schools in Zambia maintain a School In-service Record (SIR) with details of dates and items discussed at TGMs. Photographs of the SIRs for TGMS held in the past terms were taken. The analysis of these demonstrated a lack of consistency, clarity and quality in records pertaining to the number and content of teacher group meetings held. It was not possible to be completely sure about the proportion of these meetings which involved collaborative activity. For the purposes of this study we defined meetings which involved 'lesson study', and discussion about 'teaching', 'learning' or 'pedagogy' as collaborative. Meetings devoted to administrative matters, inductions or formal lectures were not defined as 'collaborative'. The result of this limitation is that the figure of 48% of meetings potentially involving collaboration presented in the findings, represents an absolute maximum. The reality is likely to be lower than that.

Interpretation of lesson observation activities: Table 2 provides the categories included in the lesson observation tool for enumerators. As explained above, reading, writing and questioning was found to be difficult for enumerators to interpret, so the only categories which could be reliably attributed to 'active learning' was the time in which learners were working or talking in groups or pairs. This can be reliably observed and therefore used for comparison purposes over time.

The other measures have contributed to a qualitative picture of lessons, one which shows lessons are largely passive from the learner's perspective. All will be re-measured in future surveys for comparative purposes.

3 Findings and discussion

The findings will be dealt with in terms of the two research questions, considering classroom practices followed by teacher collaboration and school-based continuing professional development.

3.1 Classroom practices

The research question related to classroom practices is: What observable classroom practices with respect to active teaching and learning are currently taking place in primary schools in the 4 target districts of Central Province?

Data for this question were gathered from 140 lesson observations, questions to teachers which accompanied the lesson observations and interviews with 204 teachers across the 54 schools in the study sample.

The lesson observation data in particular, provides a rich picture of what is happening in lessons in terms of what the teacher is doing and what the learners are doing. Data for all the observed (see Table 2) activities are presented (see Figures 1-6).

On analysis of the activities observed, reading, writing and the nature of questioning were found to be less reliable measures of active learning, as enumerators had not made a clear distinction between writing and writing (not copying), reading was mainly one child reading aloud to the class, and questions were not in fact differentiated as 'open' or 'closed'. The most reliable measure for observable active learner engagement was found to be the time learners spent talking or working in groups and pairs. For the purpose of this study therefore, it was decided to focus on these as proxy measures for active teaching and learning.

The main findings in relation to the extent of group work and pair work as a measure of active teaching and learning are:

- **The data (across all representations) are suggestive of predominantly teacher-led lessons and passive involvement of learners;**
- **Lesson observations suggest low levels of group and pair work in practice;**
- **The average proportion (mean) of lesson time in which learners were engaged in group or pair work activities is 9% (4 minutes);**
- **The mid proportion (median) of lesson time in which learners were engaged in group or pair work activities is just 5% (2 minutes), suggesting that a smaller proportion of teachers are using more group and pair work, helping raise the mean;**
- **41% of lessons observed have no evidence of group or pair work;**
- **The use of group work is more common than the use of pair work;**
- **Teachers report high levels of confidence and use of group and pair work.**

Figures 1 to 6 show the distribution of activities undertaken by teachers and learners during the observed lessons.[23] The box plots presenting the observed teaching and learning practices show that, although the average or the mean is low in all categories, there is also considerable variation across the sample, with the result that in all cases the median, or mid value, is considerably below the mean. This is consistent with information gathered at the ZEST Design Workshop held in Chisamba in February 2018, which suggested that there is inconsistent engagement amongst teachers with the current SBCPD and a range of understanding and practice regarding actively

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[23] The data are presented in 'box plots' and in pie charts. The 'box plots' show the mean (a cross), the median (a line) and the range (the total length of the line).

engaging students in learning. The data suggest that most of the teachers were at the lower end in regard to practice, with just a few teachers at the higher end, raising the mean. It is reasonable therefore to conclude that the 'mean' inflates the data around active teaching and learning. Compared to using the mean, the median provides a more representative figure of current practice across the sample of teachers and therefore makes a more reliable measure of progress, as the median is not affected by outliers (extremely active or inactive teachers)—in other words raising the median above the baseline would reflect more teachers' lessons demonstrating more active learning.

Teacher activities

The data for the proportion of teacher activities observed in the lessons are presented below (Figures 1, 2 and 3). The data are provided in the form of both box plots and pie charts. As the evidence suggested no significant difference between the actions of male and female teachers, the figures showing the data disaggregated by gender are provided in Appendix 7.

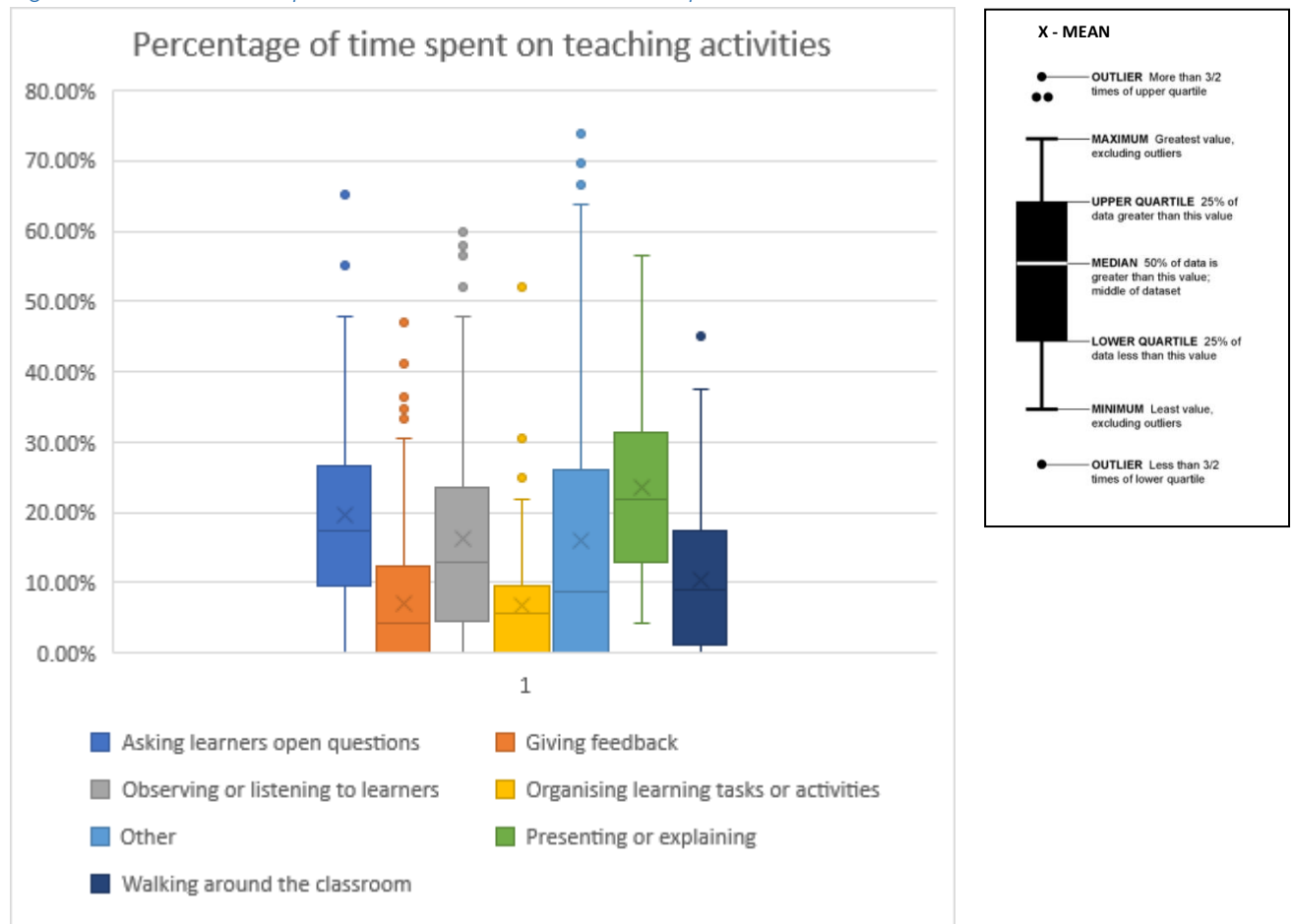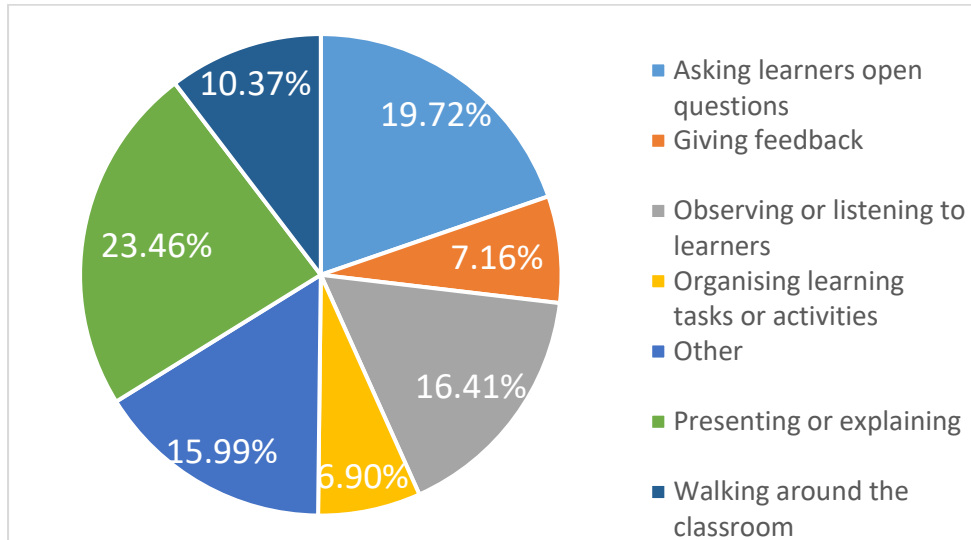*Figure 1: How teachers spent their time in the lesson – box plot*

Figures 1 and 2 indicate that the activities most used by teachers were 'presenting or explaining' followed by 'asking open questions' (although the evidence suggests that these were recorded as 'asking questions' not necessarily 'open' questions – see below). The least used activities were 'providing feedback' to learners and 'organising learning tasks and activities'.

An alternative representation of this data is provided in Figure 3. Here the horizontal axis shows the duration of the lesson, and it indicates that most lessons followed a pattern which was teacher-led at the start with more 'giving feedback' and 'walking around the room' in the second half of the lesson. The actual length of the lessons varied but the intended lesson time in Zambia is 40 - 50 min. The data in Figure 3 therefore represent the average across all the lessons observed.

Figure 3: Teacher actions during lessons
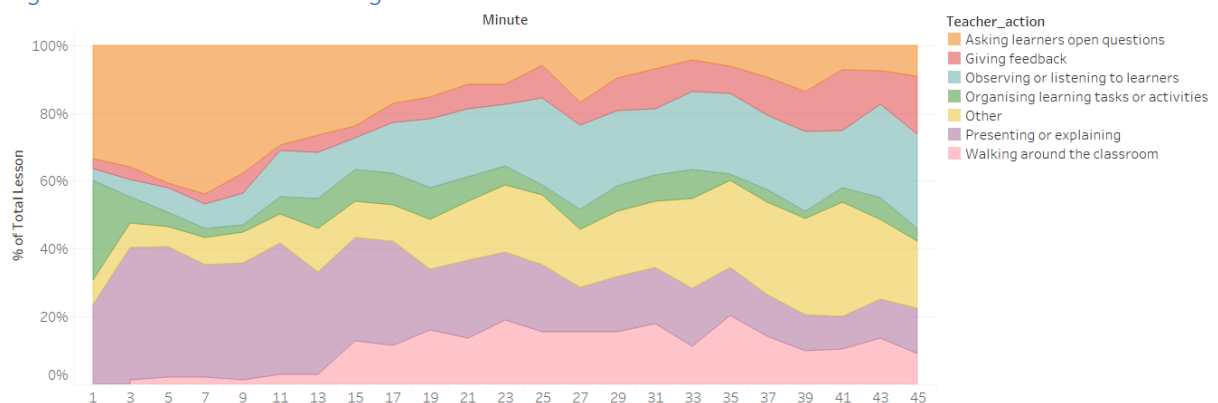
These data (across all representations) are suggestive of predominantly teacher-led lessons, in which the teacher stays at the front of the classroom and gives limited feedback to learners.

As indicated in the limitations and discussion above, the term 'open' questions proved to be problematic for enumerators to record consistently. Taking into consideration comments from the enumerator supervisor and Figures 3 and 6 (see below) in which we find that questioning correlated with 'students chorusing replies', it became apparent that the nature of the questioning recorded was unlikely to be open. It was therefore decided to exclude the nature of questioning as a reliable measure for active teaching and learning as this level of distinction would require more highly trained enumerators. This is supported by other studies in the field (Scarf, Hammersley, 1986).

Learner activities

The data for the proportion of the learner activities observed in the lessons are presented below (Figures 4, 5 and 6). The data are provided in the form of both box plots and pie charts.

Figure 4: How learners spent their time during the lessons – box plot
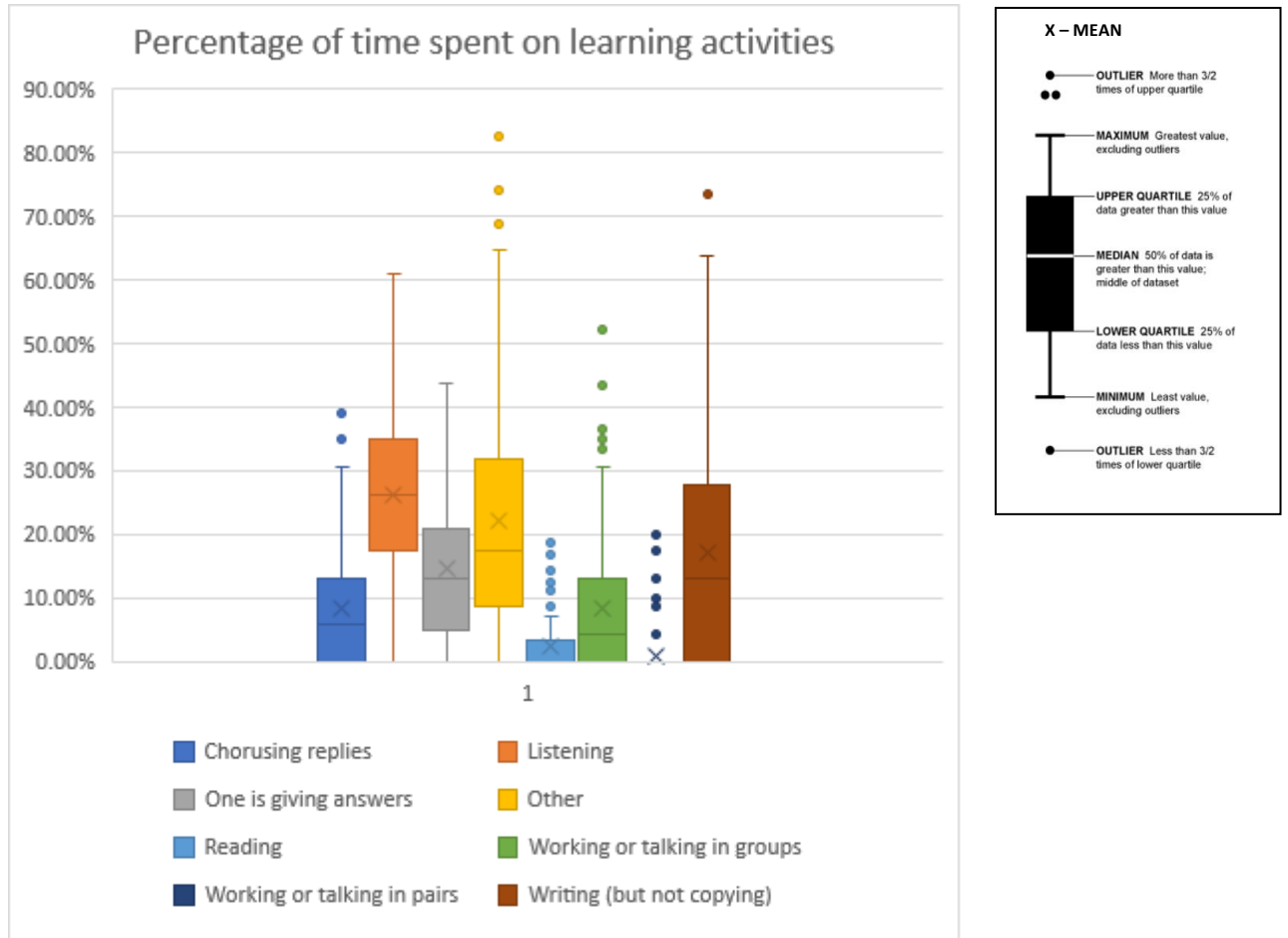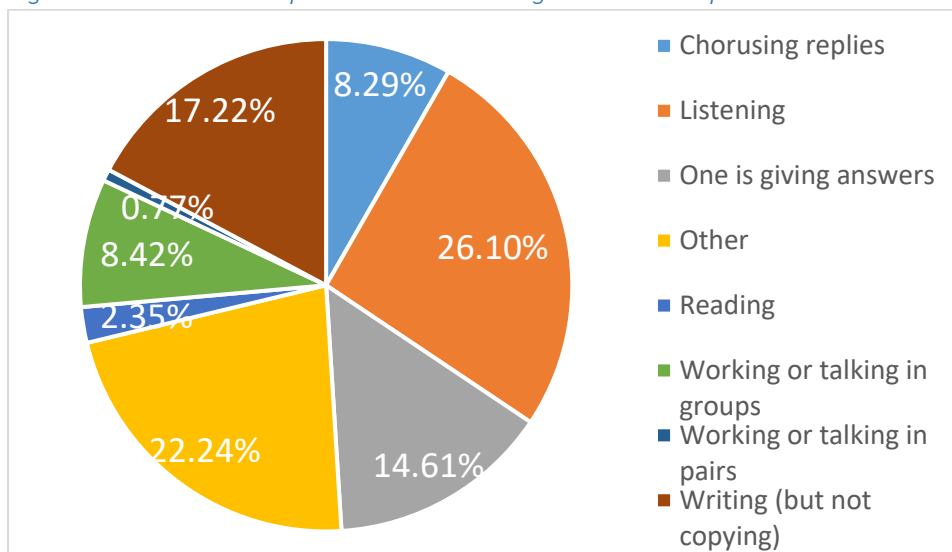

Figure 5: How learners spent their time during the lessons – pie chart

As Figures 4 and 5 show, among learners, the most common activities were 'listening' and 'writing'. The activities learners were least involved in were 'working or talking in pairs', 'reading' and

'working or talking in groups'. As with the teachers' activities, there were no significant differences in the activities learners were involved in between male and female teachers. The disaggregated data are therefore included in Appendix 7.

The low number of 'reading' activities can be linked to the limited availability of textbooks for learners; learners used textbooks in only 13% of lessons observed. Investigation additionally revealed that the 'reading' recorded was a largely passive activity for most learners, who listened to one person reading to the class. Reading was not therefore considered to be a reliable measure of active learning.

Writing proved to be problematic (in terms of an observable measure of active teaching and learning in this study) as discussion with the enumerator supervisor suggested that the writing activity actually recorded was largely copying from the chalkboard or from books, even though the category was labelled 'writing (not copying)'; writing therefore could not be relied upon as a measure of active learning.

Figure 6 provides an alternative representation of the data (the horizontal axis represents the duration of the lesson), showing that the pattern is one of learners listening at the start, with more writing in the second half of the lesson.

Figure 6: Learners actions during lessons
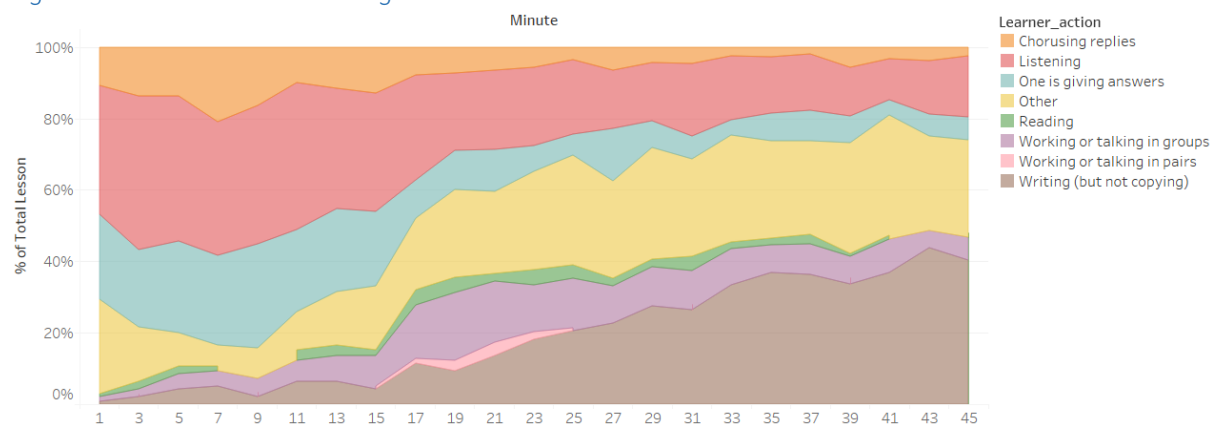
The statistical analysis (a Chi-Square test) of association between teacher and learner activities shows high correlation between teacher and learner activities during the lessons adding to the credibility of the data obtained during the lesson observations (including, in particular, concern about the nature of the questioning).

This data are suggestive of the largely passive involvement of learners in lessons.

'Other' category

During the lesson observations several activities did not fit in the pre-coded categories for teacher and learner activities. In these cases, enumerators identified these activities as 'other' and added a description of the type of activity was observed. This accounted for 22% of lesson time, or approximately 8 minutes.

An analysis of the description of these activities was undertaken (see Appendix 8). Any which matched the pre-coded categories were re-incorporated into the data presented in Figures 1 to 6. Figure 7 provides a breakdown of the nature of the activities remaining in the 'other' categories.
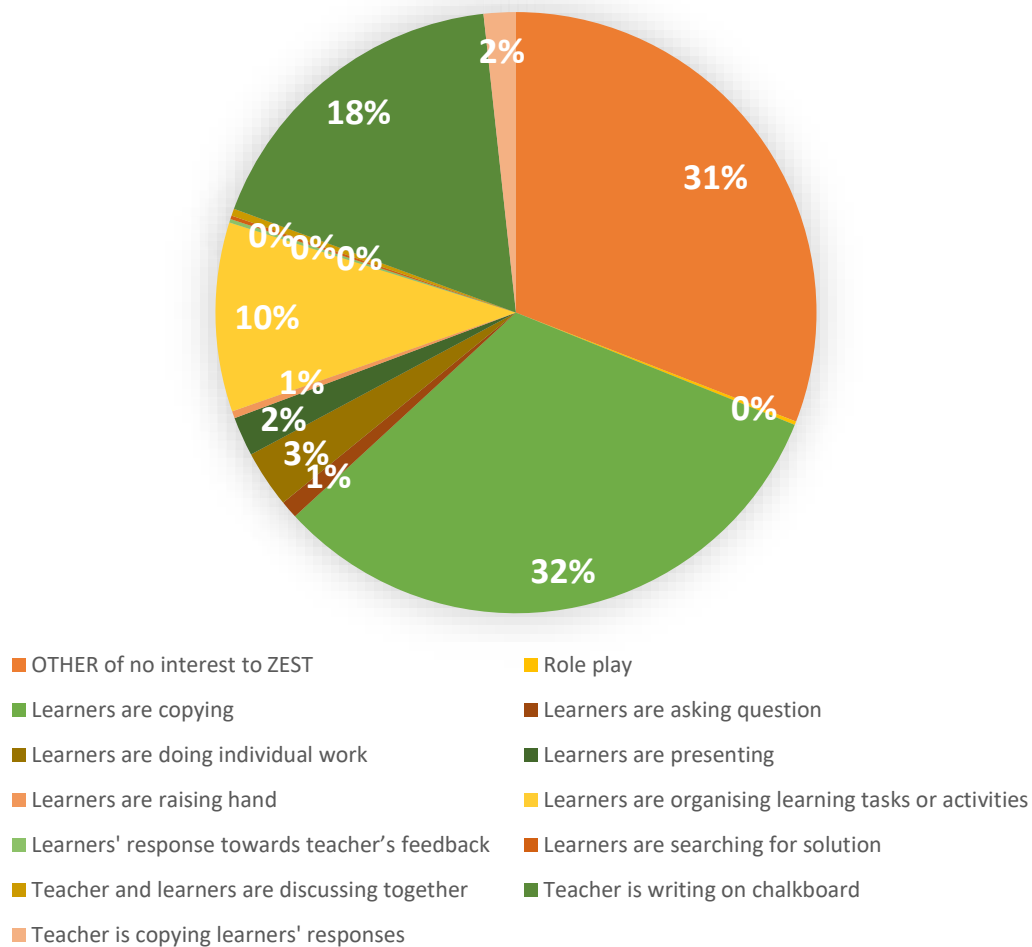
Activities deemed to be 'of no interest to ZEST' included: classroom management, looking after the school environment, taking the register, distributing resources.

The large number of 'other' activities, even after the reallocation of some of them, highlights the challenges of this type of work. In the follow-up studies to be used as part of the ZEST project, the 'other' categories highlighted will be used to inform the training of enumerators. However, the 'other' categories do not affect the proxy measure chosen for active learning (time learners were working or talking in groups or pairs).

Among the activities more related to teaching and learning, the highest percentage in the 'other' category was for 'learners copying' followed by the 'teacher writing on the board' which again demonstrate limited active participation from the learners in the lesson.

Additional observation data

As part of the lesson observation tool, enumerators were asked to record some observations about the resources available and in use in the classroom.

Analysis of the additional data pertaining to the class setting and use of resources (Teacher Lesson Observation - questions 12- 16) indicates that:

- 65% of teachers used textbook in the lesson
- In 13% of lessons textbooks were used by learners
- 68% of classrooms had no learners' work displayed

- 56% of classes did not have any evidence of teaching resources (apart from textbooks)
- In 50% of lessons teachers used the learners' names frequently.

Summary of the key measure: learners working and talking in groups and pairs

As discussed, we identified taking part in pair work and group work as the most reliable observable indicator for active engagement in learning. The data pertaining to this measure were therefore analysed in more detail and are presented in Table 9.

Table 9: Values for the pair work / group work observed in the lessons

	N	Mean	Median	Std. Deviation	Min	Max	25th percentile	75th percentile
Working or talking in groups	140	8%	4%	11%	0%	52%	0%	13%
Working or talking in pairs	140	1%	0%	3%	0%	20%	0%	0%
Total	140	9%	5%	11%	0%	52%	0%	14%

The analysis shows:
- In 41% of lessons there was no working or talking in groups or pairs;
- 9% (4 minutes) was the average (mean) proportion of observed lesson time in which learners worked or talked in groups or pairs;
- 5% (2 minutes) was the mid proportion (median) of observed lesson time in which learners worked or talked in groups or pairs;

The intention is that as a result of ZEST, a greater proportion of the lesson time will involve more students' active learning measured through an increase in learners working and talking in groups or pairs.

3.1.1 Teachers' confidence in using active classroom practices

In a structured and largely pre-coded interview, the 204 teachers in the sample participating in the study were asked about their confidence in using, and the extent to which they use active teaching and learning approaches in their lessons.

The key findings in relation to teachers reporting confidence in and use of active teaching and learning are:

- **Teachers report high levels of confidence and use of group and pair work;**
- **The proportion of teachers reporting being 'confident' or 'very confident' in using group work is 87%, and pair work 66%;**
- **The proportion of teachers reporting using these in most or every lesson is 74% for group work and 37% for pair work;**
- **Teachers report higher use of and confidence in using group work than pair work;**
- **22% of teachers report never using group or pair work;**
- **Lesson observations show just 59% of teachers using group work or pair work; and just 2-4 minutes of lesson time engages learners in group or pair work activities.**

The data, as presented in Tables 10 and 11, suggest that most teachers report being confident or very confident in using active teaching approaches in their lessons and that they use these in all or most lessons.

Table 10: Teachers' reported confidence in use of active teaching approaches

	Pair work		Group work	
	N	%	N	%
Very confident	75	37%	117	57%
Confident	58	29%	61	30%
I try this	29	14%	12	6%
Will try with help	2	1%	8	4%
Not confident	13	6%	4	2%
I have not done this	27	13%	2	1%
Total	204	100%	204	100%

As shown in Table 10, 66% reported being confident or very confident in using pair work (27% for males and 38% for females), while 87% of teachers reported being 'confident' or 'very confident' in using group work (34.8% for male teachers and 52%% for females). This represents an aggregate value of 76%.

Table 11: Teachers' reported use of active teaching approaches

	Pair work		Group work	
	N	%	N	%
Every lesson	22	11%	67	33%
Most lessons	54	26%	83	41%
Once/twice in a day	16	8%	7	4%
2 or 3 times in a week	42	21%	27	13%
Once a week	18	9%	6	3%
Less than once a week	12	6%	7	3%
Never	40	19%	7	3%
Total	204	100%	204	100%

As shown in Table 11, 37% and 74% of teachers respectively reported using pair work and group work in most or every lesson, an aggregate of 56%.

Lesson observations showed that 59% of teachers used group work or pair work and that the median proportion of lesson time which involved learners working or talking in groups was just 5% or 2 minutes. This seems incongruous with the reported confidence and use.

This finding is not surprising given the emphasis by the MoGE on increasing active teaching and learning through SBCPD and TGMs. Teachers have gained knowledge of active teaching and learning approaches and therefore feel a degree of confidence, but they struggle to practically implement these approaches regularly. In fact, experience in other projects in which the OU has been significantly involved (eg English in Action in Bangladesh and Teacher Education through School-based Support in India) suggests that confidence levels are likely to drop as teachers come to understand what is meant by active learning in practice.

Given the discrepancies between reported confidence, self-reported use and observed use of pair and group work, we suggest that reported confidence is not the best indicator of progress in practice, and that an alternative, which looks at teachers' use of the desired approaches, would be more meaningful.

3.2 School based teacher collaboration and continuing professional development

The research question for this aspect of the study is: What was the amount and nature of teachers' participation in collaborative SBCPD in primary schools in the 4 target districts of Central Province over the past 3 terms?

Data for this question were taken from the 54 CPD interviews conducted with headteachers or their nominated senior staff involved in coordinating SBCPD in the participating schools.

The key findings in relation to the amount and nature of school based teacher collaboration and continuing professional development are:

> - **The average (mean) number of Teacher Group Meetings (TGMs) held per term over the past three terms is 3. The mid (median) number of Teacher Group Meetings (TGMs) held per term over the past three terms is 2, suggesting that a smaller proportion of schools are holding more TGMs and helping raise the mean;**
> - **22% of schools did not have any TGMs in term 2 of 2017, 24% in term 3, and 19% in term 1 of 2018;**
> - **43% of schools held an average of 3 or more TGMs over the 3 terms;**
> - **Only in 7% of schools was Lesson Study specifically reported as part of their SBCPD or TGMs;**
> - **From the interviews and school record data, it was not possible to come to robust conclusions as to the proportion of TGMs which involved collaborative SBCPD. This would require a more complete qualitative study of the actual events or a more detailed interview of teacher participants; however, even with a generous inference of what was implied, only about half (48%) of the activities recorded could be attributed as collaborative SBCPD.**

TGMs are a well-established feature of the SPRINT SBCPD system in Zambia. As outlined in In-service Strategy in Zambia (2017), the expectation from the MoGE is that schools in Zambia will have regular (mostly fortnightly) TGMs to collaborate, using the Lesson Study approach, in support of their Continuing Professional Development in the two key areas of content knowledge and pedagogy or methodology.

Regarding the amount of teachers' engagement in collaborative SBCPD, the study looked at the number of TGMs schools held in the last three terms: terms 2 and 3 of the 2017 school year, as well as term 1 (January to March) of 2018. The data are presented in Figure 8.
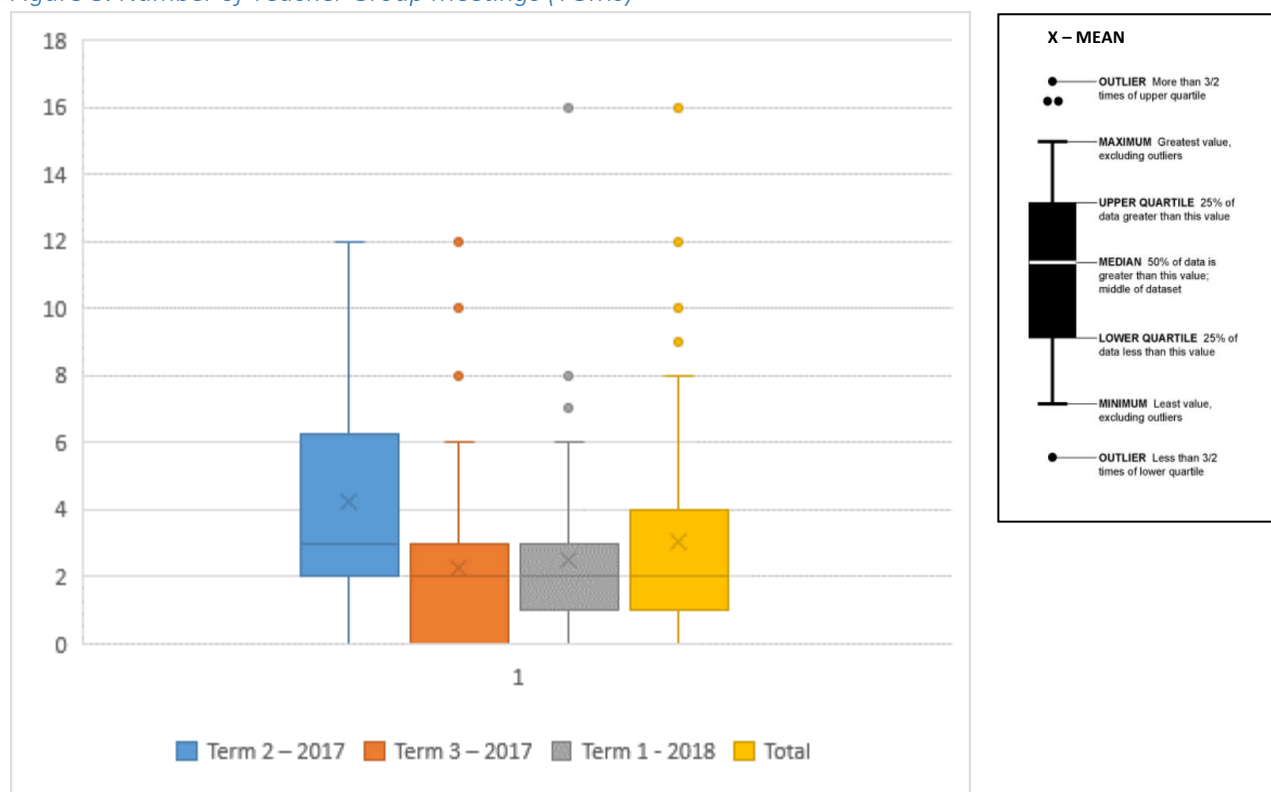
Figure 8: Number of Teacher Group Meetings (TGMs)

Table 12: Number of Teacher Group Meetings (TGMs) held

	N	Mean	Median	Std. Deviation	Min	Max	25 percentiles	75 percentiles
Term 2 – 2017	54	4.24	3	3.15	0	12	2.00	6.25
Term 3 – 2017	54	2.28	2	2.62	0	12	0.00	3.00
Term 1 - 2018	54	2.5	2	2.65	0	16	1.00	3.00
Total	162	3.01	2	2.94	0	16	1.00	4.00

As the data (Figure 8 and Table 12) indicate, in term 2 in 2017, the number of TGMs held in the schools in the study sample, ranged from 0 to 12, with the majority having between 2 and 6 TGMs. In term 3 of 2017, the number of TGMs also ranged from 0 to 12, with the average number per school ranging from 0 and 3; the same schools who had 12 in term 2 also having 12 TGMs in term 3. In term 1 of 2018, when the baseline was conducted, the number of TGMs ranged from 0 to 16, with the average ranging between 1 and 3 across the term. Among the schools included in the baseline, 13 schools indicated they did not have any TGMs in term 3 (2017), as opposed to 7 in term 2 (2017), and 10 in term 1 of this year (2018). In term 2 (2017) 18 schools reported to have had between 0 and 2 TGMs; in term 3, the figure reporting to have had up to 2 TGMs was 35 schools and 36 in term 1 of 2018. It is not surprising perhaps that term 3 has the smallest number of TGMs, as this is the term in which examinations take place.

The data showed that in the three terms preceding the start of the ZEST programme, schools had an average of 3 TGMs per term, although there is considerable variation between schools, and between terms, with the median being just 2 TGMs per term overall. This too is consistent with information from the ZEST Design Workshop held in Chisamba in February 2018, which suggested that there is varied engagement with the SPRINT SBCPD among schools. As with the lesson observation data, a

majority of schools were at the lower end in regard to regular engagement in TGMs with a few at the higher end, raising the mean. It is reasonable therefore to conclude that the 'mean' inflates the data and that compared to using the mean, the median provides a more representative figure of current engagement in TGMs across the sample of schools and therefore would make a more reliable measure of schools' engagement in SBCPD, as the median is not affected by outliers.

To identify the proportion of TGMs in which teachers collaborate around teaching and learning, the data on the focus of the TGMs were analysed on the basis of the topics or activities recorded and reported in the CPD interview. Lesson Study was taken to be collaborative SBCPD; discussions of 'teaching', 'pedagogy' and 'learning' were included as being potentially collaborative; topics involving administrative, induction, organisational matters, or lectures on particular issues were not.

The coding was done on the basis of whether or not topics or activities had the potential to involve collaborative work and discussion of teaching and learning. It should be noted that it is difficult to ascertain how much collaboration actually took place in these meetings, as no time or proportion of the meeting taken up with any topic was collected or recorded in School In-service Records (SIR). This would require a qualitative study of actual meetings or detailed interviews with participants. It was assumed that if the topic for discussion was an aspect of lesson study, a specific curriculum area, pedagogy, teaching or learning, then it was likely to have involved teachers sharing their experiences and therefore was collaborative.

On this basis, the data on the TGMs undertaken in the last three terms, shown in Table 13, indicated that 48% of the topics discussed had the potential to be collaborative, including between 4% and 9% of what the CPD co-ordinator described as Lesson Study, and that 52% of the topics discussed involved activities not focused on teaching and learning such as school administration, staff matters, the organisation of examinations, staff induction and discussions about facilities. 48% represents the maximum amount of collaboration that is likely to have taken place, and evidence from the ZEST Design and Launch workshops suggests that some of the meetings about teaching methods involved a lecture or presentation from an experienced teacher or district official and were not necessarily collaborative.

In the teacher interviews, teachers were also asked how often they collaborate with colleagues. However, given the unreliability of the reported evidence about active teaching and learning, the analysis of this data has not been included here. The recorded practices therefore form the basis for the conclusions from this baseline study, rather than reported practices.

Table 13: Focus of TGMs

	Term 2 - 2017	Term 3 - 2017	Term 1 - 2018	Total
TGMs indicating potentially collaborative SBCPD	47%	47%	51%	48%
TGMs with Lesson Study	9%	7%	4%	7%

Summary of the key measures: collaborative teacher SBCPD
The data on the number of school TGM averages and thresholds are presented in Tables 14 and 15.

Table 14: School by number of Teacher Group Meetings (TGMs) held each term

	Term 2 2017	%	Term 3 2017	%	Term 1 2018	%
0 TGM held	7	13%	18	33%	10	19%
1 TGM held	3	5.5%	6	12%	8	15%
2 TGM held	8	15%	11	20%	17	31%
3 TGM held	11	20%	7	13%	9	17%
4 TGM held	3	5.5%	5	9%	4	7%
≥5 TGM held	22	41%	7	13%	6	11%
Total	54	100%	54	100%	54	100%

Table 15: School by average number of Teacher Group Meetings (TGMs) held

	Term 2 2017	Term 3 2017	Term 1 2018	Average across the 3 terms
< 1 TGMs held	13%	33%	19%	11%
≥ 1 TGMs held	87%	67%	81%	89%
≥ 2 TGMs held	81%	56%	67%	65%
≥ 3 TGMs held	67%	35%	35%	43%
≥ 4 TGMs held	46%	22%	19%	24%
≥ 5 TGMs held	41%	13%	11%	15%

As explained, it was not possible to come to robust conclusions as to the proportion of TGMs which involved collaborative SBCPD. This would require a more complete qualitative study of the actual events, or more detailed interviews of teacher participants. However, 7% of meetings recorded specific references to lesson study and with a generous inference of the data, this rises to about half (48%) of the TGMs potentially reflecting collaborative SBCPD.

4 Conclusions

4.1 Conclusions from the study

The ZEST baseline study was undertaken to understand the current situation in primary schools in the 4 target districts in Central Province in Zambia. It focused on teachers' classroom practices and active teaching and learning approaches, as well as collaborative work between teachers in SBCPD, more particularly in TGMs. It aimed to address two research questions:

1. What observable classroom practices with respect to active teaching and learning are currently taking place in primary schools in the 4 target districts of Central Province?
2. What was the amount and nature of teachers' participation in collaborative SBCPD in primary schools in the 4 target districts of Central Province over the past 3 terms?

In answering the first research question, the lesson observation data in particular provided a rich picture of what is happening in lessons in terms of what the teacher is doing and what the learners are doing. On analysis, reading, writing and the nature of questioning were found to be unreliable measures of active learning, as enumerators had not made a clear distinction between writing and writing (not copying), reading was mainly one child reading aloud to the class, and questions were not differentiated as 'open' or 'closed'. The most reliable measure for observable active learner engagement was found to be the time learners spent talking or working in groups and pairs. For the purpose of this study therefore, it was decided to focus on these as proxy measures for active teaching and learning, although data for all the activities are presented here.

Teachers from 54 schools reported high levels of confidence and reported use of these approaches; however, the lesson observation data suggested much lower levels of practice. On average, **just 2-4** minutes in a 40-45-minute lesson showed learners engaged or talking in groups or pairs. The median proportion of lessons that contained this measure of active teaching and learning was just 5%. The data also suggest that 50% of the lessons used group or pair work for less than 2 minutes, and 41% of lessons had no evidence of group or pair work activities, although the number of teachers reporting never using these approaches was lower (22%). Teachers used much more group work than pair work in lessons.

The main findings in relation to research question 1 are therefore:

- **The data (across all representations) are suggestive of predominantly teacher-led lessons and passive involvement of learners;**
- **Lesson observations suggest low levels of group and pair work in practice;**
- **The mean (average) shows 9% (4 minutes) of lesson time was devoted to group or pair work activities;**
- **The median however shows just 5% (2 minutes) of lesson time is devoted to group and pair work activities, suggesting that a smaller proportion of teachers are using more group and pair work helping raise the mean;**
- **41% of lessons observed have no evidence of group or pair work;**
- **The use of group work is more common than the use of pair work;**
- **Teachers report high levels of confidence and use of group and pair work;**
- **22% of teachers report never using group or pair work.**

Zambia has a CPD strategy which encourages collaborative SBCPD in schools through regular TGMs. In answering the second research question, the study therefore looked at the number of TGMs schools held over the past three terms and the content of those TGMs. 54 SBCPD interviews were

completed and the schools' School In-service Record (SIR) analysed. On average, schools had 2-3 TGMs per term, although there was considerable variation across and within the three terms.

Analysing the content of the TGMs was not straightforward due to different levels and models of record keeping among schools as well as the varied engagement in and understanding of Lesson Study and collaborative SBCPD.

The main findings in relation to research question 2 therefore are:

- **The average (mean) number of Teacher Group Meetings (TGMs) held per term over the past three terms is 3. The mid (median) number of Teacher Group Meetings (TGMs) held per term over the past three terms is 2, suggesting that a smaller proportion of schools are holding more TGMs and helping raise the mean;**
- **22% of schools did not have any TGMs in term 2 of 2017, 24% in term 3, and 19% in term 1 of 2018;**
- **43% of schools held an average of 3 or more TGMs over the 3 terms;**
- **Only in 7% of schools was Lesson Study specifically reported as part of their SBCPD or TGMs;**
- **From the interviews and school record data, it was not possible to come to robust conclusions as to the proportion of TGMs which involved collaborative SBCPD. This would require a more complete qualitative study of the actual events or a more detailed interview of teacher participants; however, even with a generous inference of what was implied, only about half (48%) of the activities recorded could be attributed as collaborative SBCPD.**

4.2 Implications for the ZEST project logframe indicators, baselines values, measures and milestones

The aim of the ZEST project, as set out in the ZEST theory of change (Appendix 1), and reflected in the project Logframe (Appendix 2) is to contribute to improved quality of teaching and learning experiences for children in primary schools in Zambia, by helping primary teachers in Central Province improve the quality of their classroom practice. Working with MoGE, the project will do this by co-designing and testing a SBCPD programme with primary teachers, school leaders and educational officials; implementing the SBCPD programme with up to 4000 primary teachers in Zambia's Central Province; and building capacity of MoGE officials in implementing the programme in support of operationalising the MoGE national In-Service Strategy.

The Logframe (Appendix 2) sets out key indicators and milestones against which to measure and report on progress. Most of these indicators are 0 at the baseline, as they relate to specific activities to be undertaken as part of project implementation.

The baseline study, and its research questions, were set out to provide information on the current situation in schools in 4 target districts in Central Province in Zambia, in order to establish a baseline and suggest milestones for two outcome indicators and one output indicator, which are:

Outcome

- Outcome indicator 1: % participating teachers demonstrating improved classroom practice
- Outcome indicator 2: % of participating schools implementing the school-based professional development programme, recording an increase in collaborative work

Output

- Output indicator 1.4: % of participating teachers reporting increased confidence in collaborative classroom practices

Each are dealt with in turn below, drawing on the findings from the study.

Outcome indicator 1

% of participating teachers demonstrating improved classroom practice (above the baseline, measured by the median proportion of time learners are working / talking in groups or pairs, in a sample of observed lessons)

Baseline: 5% (median)

Proposed Revised Milestones: Year 1[24] – 5% (median); year 2 – 8% (median); year 3 – 10% (median); year 4 – 10% (median); year 5 – 10% (median)

These adjusted measures, and therefore related milestones, are proposed as a result of this study.

It should be noted that the number of teachers targeted will increase significantly, from cohorts of 200 (years 2 and 3) to 2000 in year 4, when the SBCPD programme will be implemented more widely, so, though the 10% remains constant, it in fact represents a significant increase as a result of the increase in scale.

There is a considerable variation across the sample in the proportion of teachers' lessons which demonstrate active teaching and learning in the lesson observation data. Measuring progress of specific teachers would therefore require a longitudinal, pre and post intervention observation, an approach which is outside the scope of the project. This can however be addressed by measuring the proportion of lesson time teachers engage learners in active learning, in this case defined as working or talking in groups or pairs. This amounts to a similar measure, but is more meaningful in relation to a sample based methodology.

<u>By this adjusted measurable milestone, the project would in fact aim to double (on average, across the population) the proportion of lesson time in which participating teachers engage learners in active teaching and learning. The project would seek to sustain the level of improvement from year 3 onwards while increasing the scale in terms of the numbers of teachers who participate.</u>

Additionally, by adopting the median instead of the mean, the measure seeks to reflect movement across the population, accounting for the skewed distribution of the % of active learning time and ensure that most teachers progress in their practice. Additionally, this is significant in statistical terms as an increase in the median from the baseline 5% to a target of 10% represents an improvement with estimated effect size of 0.336 standard deviation (see Hattie for the kind of effect sizes that are expected from innovations[25], and Cohen[26]).

Progress against the targets would be measured by repeating the observations carried out at baseline with a sample of post-intervention lessons and calculating the median proportion of lessons which demonstrate active classroom practices (learners working or talking in groups or pairs). Further comparison tests would be carried out to determine whether the increase in the median is statistically significant.

Alongside this observable proxy measure of active teaching and learning, this study has also provided other insights into current classroom practices. Drawing on this data, other improvements

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[24] Year 1 of the ZEST project is 6 months, from October 2017 to March 2018, in which the project was initiated and the baseline study conducted; therefore, the year 1 targets are the same as the baseline values.
[25] Hattie, J. (2008). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge.
[26] Cohen, Jacob (1988). Statistical Power Analysis for the Behavioural Sciences. Routledge. ISBN 1-134-74270-3.

in classroom practice which contribute to the aspirations embodied in the Revised Zambian School Curriculum would be anticipated, including:

1. Less time when learners are listening to the teacher, and chorusing;
2. More time when learners are involved in active learning: writing (not copying) and reading;
3. Less time when teacher is speaking to the whole class (presenting, organising tasks);
4. More time when teacher is listening to learners, walking around the classroom or giving feedback;
5. Increase in the resources used by teachers to support learning, students' work being displayed and the extent to which teachers use students' names.

Outcome indicator 2

% of participating schools implementing the school-based professional development programme, recording an increase in collaborative work amongst teachers (above the baseline, measured as participating schools which hold ≥3 TGMs per term)

Baseline: 43%

Proposed Revised Milestones: Year 1[27] – 43%; year 2 – 45%; year 3 – 60%; year 4 – 60%; year 5 – 60%

The aim is to increase the opportunity for collaboration amongst teachers by increasing the number of participating schools holding 3 or more TGMs per term. The threshold of 3 TGMs per term is set on balance of the mean and median from the baseline study as well as the feedback from the design workshops held in Chisamba in February 2018.

Based on the findings of this study, it is suggested that the targets be be maintained throughout years 3-5 to account for the project scaling up to more schools in these years, where the challenge will be maintaining the same gains at greater scale. The MoGE have also clarified that the number of TGMs is a matter for schools to decide based upon their circumstances and needs and there is a risk of the ZEST SBCPD programme being too prescriptive or burdensome for some schools to maintain if higher targets are set.

Based on the findings from this study, the project will be able to provide a more reliable and valid set of options for participants in further CPD interviews to use to describe the content of the TGMs for use in the mid-line and end-line studies. Given that the 48% probably over-estimates the proportion of meetings which involved collaborative work, it will be possible to compare data about the content of TGMs gathered at the mid and end-line with this initial figure. The following would be anticipated:

- More TGMs taking place, especially more regularly across the three terms in a school year;
- Specific reference to active teaching approaches;
- Indications that TGMs have followed the Lesson Study / ZEST cycle, including taking part in activities based on the teaching approaches and collaborative planning;
- Discussions about teaching and learning taking place in classrooms, recorded in teachers' notebooks.

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[27] Year 1 of the ZEST project is 6 months, from October 2017 to March 2018, in which the project was initiated and the baseline study conducted; therefore, the year 1 targets are the same as the baseline values.

Output indicator 1.4

% of participating teachers reporting increased confidence in collaborative classroom practices

As a result of this study, a revised output indicator is proposed:

% of participating teachers recording use of collaborative classroom practices (measured by sampling participating teachers' ZEST project logs and journals in which teachers record their activity plans, pedagogic practice, and reflections on use)

Baseline: 0%

Proposed Revised Milestones: Year 1[28] – 0%; year 2 – 10%; year 3 – 30%; year 4 – 30%; year 5 – 50%

Instead of measuring teachers' reported confidence in using collaborative active teaching and learning approaches, the proposed revised indicator will reflect actual recorded practice in and use of active collaborative teaching practices by participating teachers.

As part of their toolkit, participating teachers will be provided with a ZEST Teacher Notebook in which to record their plans and practice. The Teacher Notebook also includes two logs, reflective questions and the minimum criteria for learner-centred education. The use of this notebook will provide a record of how teachers engage with the programme, how often they practice with the focus teaching and learning approaches, and their reflections on their practice, such as aspects that work well and aspects that can be improved.

4.3 Looking forward: How the ZEST project will work

This final section considers the main findings of the study and what can be learned in relation to implementing the ZEST project. It looks at how and why the ZEST project is expected to achieve intended outcomes, and positively affect the current situation of SBCPD in Zambia.

ZEST is an ambitious programme, operating across the whole of the primary curriculum at grades 1-7. Its aim is to contribute to improved quality of teaching and learning experiences for children in primary schools in Zambia through improvements in the classroom practices of primary teachers, and effective implementation of the Revised Zambian School Curriculum.

The Revised Zambian School Curriculum calls for use of learner-centred approaches, and SBCPD is currently embedded in the system, including regular TGMs. ZEST will aim to strengthen existing systems and processes for teachers' SBCPD already in place under the School Programme of In-Service for the Term (SPRINT) system. It provides a combination of training and content, as part of a 'Teacher Toolbox' to support teachers' collaborative planning, implementation and reflection on their learner centred practice.

The outputs from the ZEST project include a co-designed and tested SBCPD programme that will be available online and offline; the implementation of the SBCPD programme in the 4 target districts of Chisamba, Kabwe, Mumbwa and Shibuyunji to reach up to 4000 primary school teachers; and the building of capacity of MoGE officials, to enable them to implement the SBCPD programme more widely.

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[28] Year 1 of the ZEST project is 6 months, from October 2017 to March 2018, in which the project was initiated and the baseline study conducted; therefore, the year 1 targets are the same as the baseline values.

In regard to improving classroom practice

It is expected that as a result of the ZEST project, teachers will become more proficient in using learner-centred approaches to their classroom practice and more children will experience more active engagement in lessons.

The basis of the ZEST SBCPD programme is in the development of primary teachers' pedagogical content knowledge (Bold et al., 2017), the promotion of strategies that have been shown to work across contexts (Alexander, 2015), and a focus on the attitudes and values associated with learner-centred approaches (Schweisfurth, 2015). The ZEST project encourages the use of active and collaborative teaching approaches in lessons. It aims to reduce the number of teachers who 'never' or 'less than once a week' use pair work or group work, and to increase the number of lessons and the proportion of lesson time in which learners are actively engaged.

The programme sets out activities based on 10 focus active learning and teaching approaches, to guide teachers, working together in TGMs, to plan activities based on these approaches for use in their own lessons.

The approach to SBCPD practiced in TGMs builds on the Lesson Study model, where teachers collaboratively plan a lesson which one individual teacher then teaches; this is observed by others and reflected upon collaboratively. Current problems with this approach are (a) schools struggle to identify a meaningful problem or need or teaching approach they can develop because of limited experience, (b) there is a lack of formative content (resources) that schools can use to inform and develop their teaching approaches through the Lesson Study cycles, (c) it is often the same teachers who volunteer to teach the Lesson Study 'model lesson', which means many teachers do not practice, reflect and receive feedback on their practice, and (d) frequently the lesson taught is of little relevance to many of the teachers who teach other grades and are unable to find synergies between the 'model lesson' and their own.

ZEST will seek to strengthen and enhance Lesson Study by (a) focusing on 10 key active learner centred teaching approaches, providing practical ideas and training in how to effectively use these approaches, (b) providing content in the form of case studies and activities for teachers to plan and use within lessons, and specific questions to discuss in TGMs (c) strengthening the cycle (see Image 1) of collaborative planning, practice, reflection and feedback by enabling all teachers to use the activities they plan, and practice using the focus teaching approaches in their own lessons. Observation and feedback still takes place but with one or two colleagues rather than a larger group.
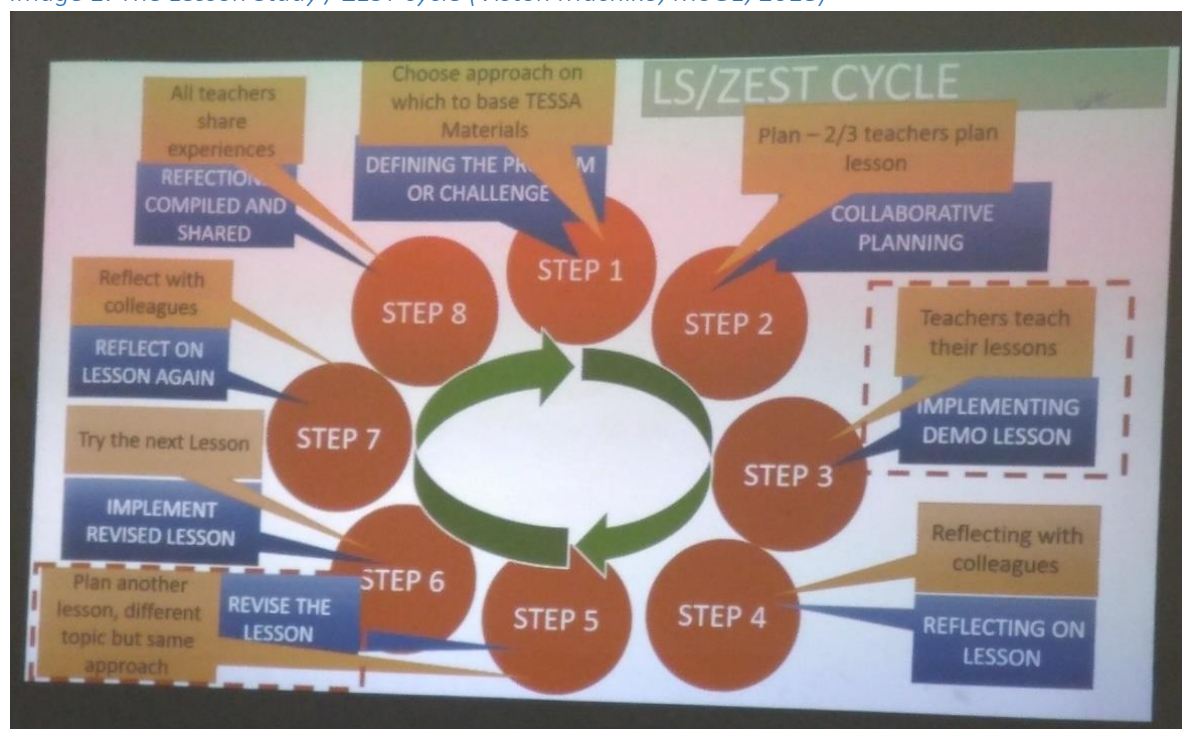
Teachers will also have access to the Teacher Education in Sub-Saharan Africa (TESSA) Open Educational Resources (OER) library[29] as a source of ideas for practical activities. TESSA OER have been contextualised for Zambia and provide practical examples of active teaching approaches. The TESSA classroom activities and case studies show teachers how to use group work and pair work when teaching a curriculum topic.

ZEST will provide the means for teachers to log and record their planned activities and use of the focus active teaching and learning approaches, as well as their reflections and feedback. A notebook specifically designed for the recording of each teacher's reflections and practice forms part of the ZEST Toolkit. Participating teachers will plan, carry out, reflect and record their practice in collaborative active classroom approaches. It is anticipated that this will lead to a greater correlation between teachers' reports of practicing using these approaches and what is then observed in their lessons.

Monitoring and Evaluation of the project on an ongoing basis will inform the planning of future project activities (workshops and materials development) by the OU's academic team resulting in an iterative approach to resource development.

In regard to increasing collaborative work amongst teachers

Regular TGMs are a strength of the SPRINT framework and SBCPD system in Zambia. From this study, and from feedback from MoGE, it is recognised that TGMs do not always take place as intended and do not always involve teachers being engaged in collaborative SBCPD work. Some essentially become staff meetings, or are simply abandoned due to lack of content or ideas. A significant challenge is that there are few resources available to support TGM discussions and activities.

The ZEST project will provide training and content around 10 key learner centred approaches for schools to use as a focal point in at least 3 TGMs per term. It is intended that these training and

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[29] www.tessafrica.net

activity planning resources will increase the value of TGMs for teachers in participating schools and enhance collaboration amongst teachers both in and between TGMs – i.e. in teachers' own lessons, observations, conversations and collaboration with colleagues. Collaboration amongst teachers does not begin and end in the TGM but is an ongoing process and becomes embedded in their professional practice. It is anticipated that, as a result, more TGMs will take place, and in particular on a more regular basis across the three terms in a school year.

To enable meaningful interaction and collaboration to take place during and following TGMs, a Facilitator Handbook will be developed to assist headteachers and SICs in the planning of the TGMs.

The Monitoring and Evaluation of the ZEST project will be looking for indications that TGMs are taking place, are effective in enabling collaboration amongst teachers and follow the Lesson Study/ZEST cycle resulting in improved practice in the classroom.

Changes in the classroom

Change in classroom practice is a slow and ongoing process, moving at different speeds for individual teachers and dependent upon many intrinsic and extrinsic factors. However, the following lists some changes in both learner and teacher activities that would be expected after a year's participation in the ZEST programme.

Learners actions
Most learners are participating and clearly enjoying the lesson.
Learners are being encouraged to talk about their ideas.
Learners are writing about their own ideas: not only copying material from a book or the chalk board.
Learners sometimes work together effectively in pairs or groups.
Learners of all levels respond to teachers and other learners' questions
Learners draw on their real-life experiences in learning: they are not just repeating words and phrases from the book.
Learners ask questions.
Learners are reading in a variety of different ways, including silently.
Learners engage in drama, storytelling, role play and presenting with some confidence

Teacher actions
The teacher appears relaxed and confident, using learners' names.
The teacher is doing less talking and more moving around the room monitoring learners as they work.
Some evidence that the lessons are planned in a logical sequence of 'stages'.
Teacher sets up activities efficiently: e.g. pair and group work, use of local resources; some classroom routines have been established.
The teacher is asking more open-ended and follow-up questions.
The teacher is including more learners in classroom activities.
The teacher may sometimes use gestures and body language to enhance the communication.
Teachers in all subjects are actively supporting literacy.
The teacher is monitoring the learning of individuals, at least for some of the time.

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6 Appendices

Appendix 1: ZEST Theory of Change

Appendix 2: ZEST Logframe (updated 28/05/2018)

Appendix 3: ZEST approaches

Appendix 4: CPD interview tool

Appendix 5: Teacher interview tool

Appendix 6: Teacher lesson observation tool

Appendix 7: Lesson observation data disaggregated by gender of teachers

Appendix 8: Lesson observation data – qualitative analysis of 'other' activity category